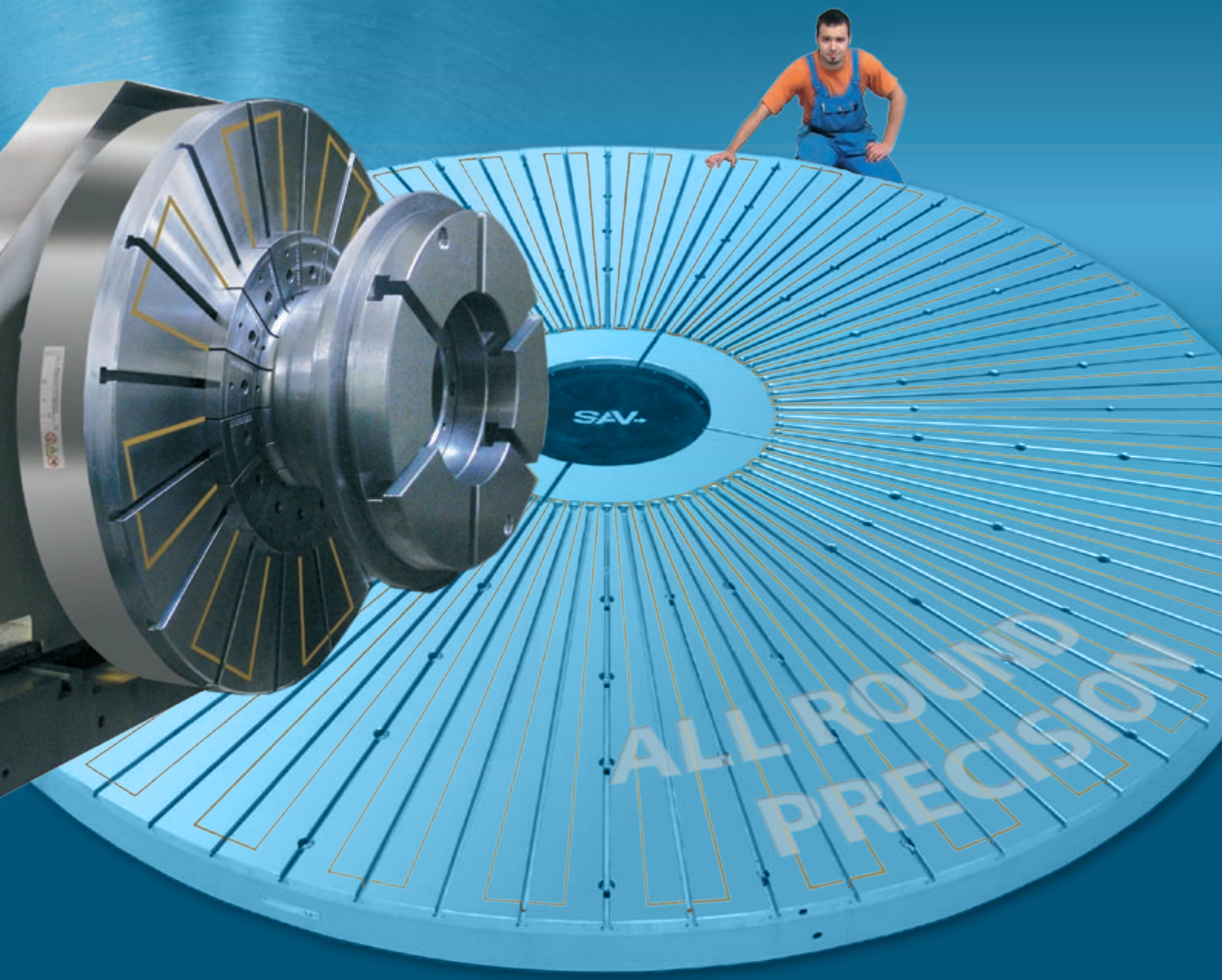
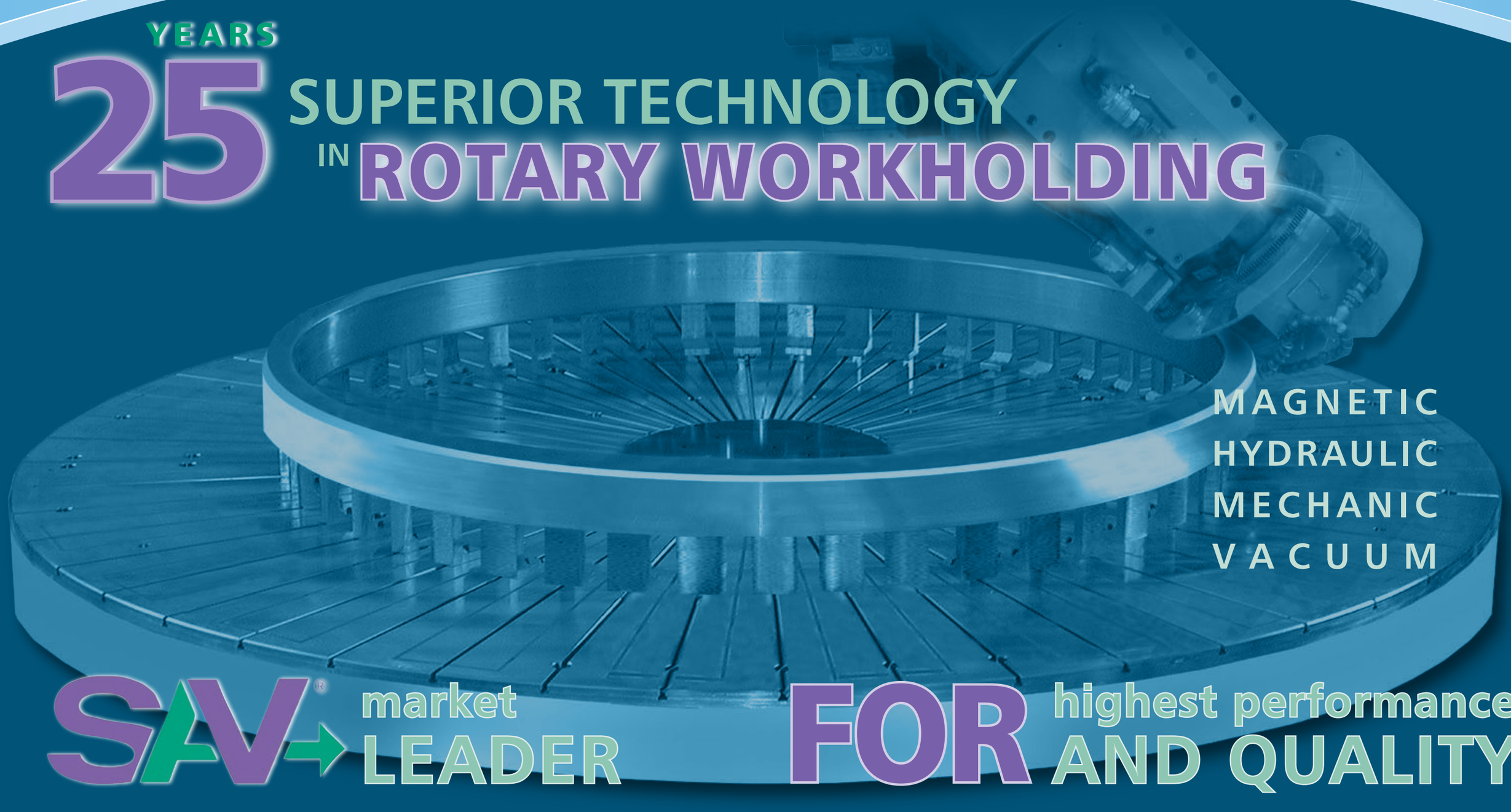
SAV

WORKHOLDING AND AUTOMATION



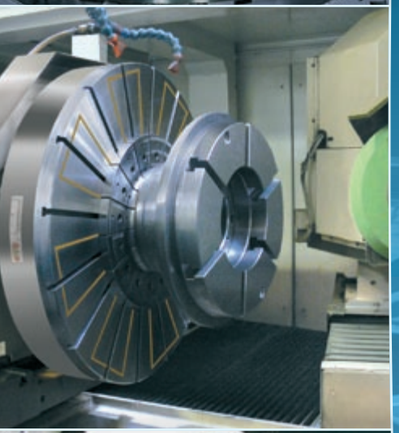
WORKHOLDING FOR ROTARY OPERATIONS

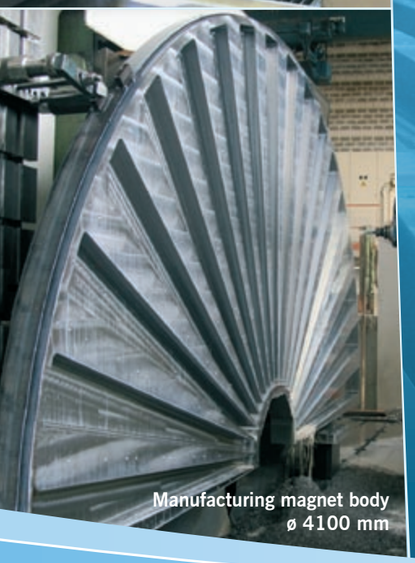
25 YEARS SUPERIOR TECHNOLOGY IN ROTARY WORKHOLDING



MAGNETIC
HYDRAULIC
MECHANIC
VACUUM

SAV® market LEADER FOR highest performance AND QUALITY





Manufacturing magnet body
ø 4100 mm

According ISO 9001/2000

PRODUCTION TECHNOLOGY

TOP QUALITY WORKHOLDING

Own production with:

- 55 machine centers up to 5000 x 3000 machining surface
- 50 profile-/ surface-/ coordinate-/ external- and internal circular grinding machines up to 4000 mm machining length

GUARANTEES

- Quality, reliability and longevity
- Efficiency
- Precision solutions
- Problem solving competence
- From Workpiece to Process – Handling and Automation
- The right principle: magnetic, hydraulic, mechanic, vacuum
- Flexibility of design manufactured in SAV factory
- Innovation – new technologies

ELECTROMAGNETIC AND ELECTRO-PERMANENT MAGNETIC CHUCKS WITH DEMAGNETIZING CYCLE

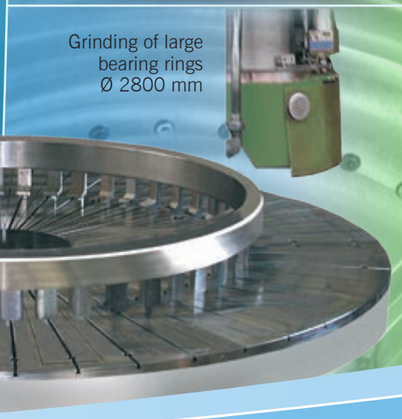
The requirements of our customers determine our products and the company philosophy.

- 12 wire- and spark erosion machines
- 4 CNC-lathes and 1 facing-lathe with table diameter Ø 3000 mm
- 4 Coordinate measuring machines

Large magnets from one piece

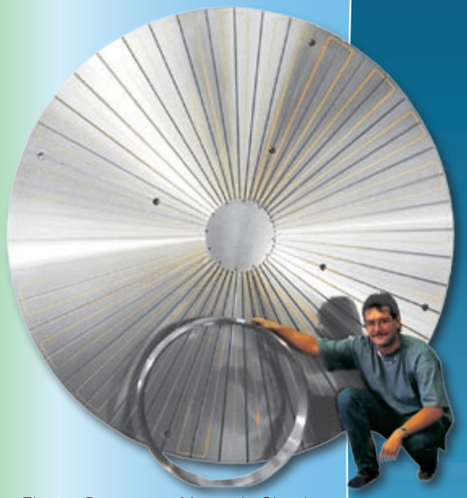
- Minimum clamping and setting times
- 3-side machining
- Universal and flexible
- Wear resistant solid state construction
- Reliable in process and clamping
- High efficiency
- Stable mono block construction
- Extreme holding forces
- Optimum workpiece damping
- Use of complete machine table surface
- High accuracy due to full surface force distribution
- Good automation possibility

PRECISION MADE IN GERMANY



Grinding of large
bearing rings
Ø 2800 mm

Quality and precision also in large sizes



Electro-Permanent Magnetic Chuck manufactured from one piece. Ø 3200 mm

SAV MAGNETS FOR TURNING / HARD TURNING

Production advantages with magnetic clamping:

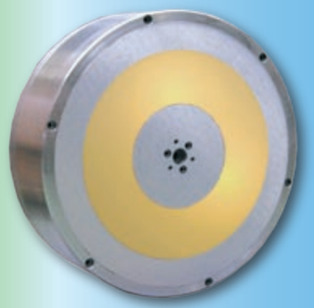
- Precision chip removal from 3 sides in one set-up
- Down pulling of the reference surfaces
- Full surface holding force with big damping for superior machining surface quality
- Most economic clamping tool with effortless machine integration
- Flexibility through large workpiece clamping range
- Removal of internal workpiece stresses during production

Test results with hard turning of a ring Ø 600 mm

Form- resp. surface quality	Reproducible quality magnetic chuck	Potential improvement *
Arithmetic middle roughness	0.3 µm	0% to 25%
Circular form difference	0.5 µm	75% to 90%
Cylindrical form failure	10 µm	80% to 85%
Wall thickness variation	25 µm	60% to 80%

* potential improvement in comparison with conventional methods

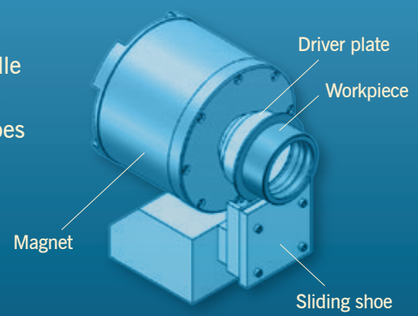
SAV MAGNETS FOR CIRCULAR AND CENTERLESS GRINDING



Electromagnetic circular chuck Ø 500 mm for shoe centerless grinding applications

The proven SAV precision products offer:

- Highest accuracies in first and second clamping set-up
- Internal coolant supply
- Combined grinding of 3 sides
- Large workpiece clamping range
- Also small, difficult workpieces can be clamped through shoe-centerless grinding
- Simple automation
- Workpiece eccentric to spindle
- Magnet for rotary movement
- Precision through sliding shoes



SAV MECHANIC AND HYDRAULIC CHUCKS

Powered solutions for

- Extreme chip removal	Column chucks	
- Precision clamping with point supports / point clamping, no pull-down of uneven parts	Rotary finger chucks	
- Shaft clamping with centre offset	Compensating chucks	
- Clamping of rings without deformation	6-jaw lever compensating chucks	
- Fine turning operations	Centering and Face clamping chucks	

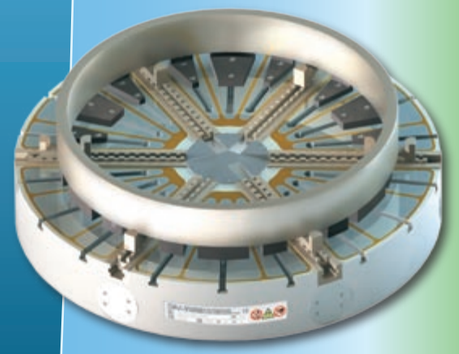
Force – well proportioned, used smart

3-jaw Tipping Lever Chuck for gear box flanges

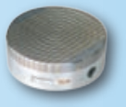
SAV COMBINED SOLUTIONS

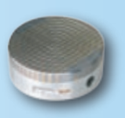
The combination of magnetic, hydraulic, mechanic and electrical power offer:

- Delicate and deformation-less clamping
- Simple automation
- Measuring of movement and force during operation process
- Reproducible centering
- Combination of first and second clamping radial and/or axial
- Oversize optimized centering



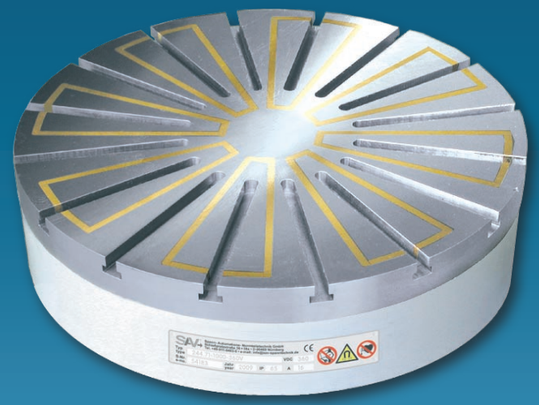
MAGNETIC WORKHOLDING – SELECTION CRITERIA

Operation	Workpieces	Selection Criteria	Products
Turning / Hard turning – Vertical spindle	For ring shaped workpieces	• High holding forces • High rotation speed range • Even pole division at perimeter • Flexible modification of diameter range • Safety and independence of electrical supply • High stiffness for machining of large parts	 **SAV 244.70 / .71** Upto ø 5000 mm and bigger
	For disc shaped workpieces	• High forces at low magnetic field height • Safety and independence of electrical supply • High rotation speed range	 **SAV 244.72** Upto ø 1600 mm  **SAV 244.73** Upto ø 800 mm
Turning / Hard turning – Horizontal spindle	For ring shaped workpieces	• High holding forces • High rotation speed range • Flexible modification of diameter range • Safety and independence of electrical supply • Simple energy supply • Holding force regulation of EP magnets for centering of workpieces possible	 **SAV 244.06** Upto ø 500 mm  **SAV 244.70 / .71** Upto ø 800 mm
	For disc shaped workpieces	• High forces at low magnetic field height • Safety and independence of electrical supply • High rotation speed range • Simple energy supply • Holding force regulation of EP magnets for centering of workpieces possible	 **SAV 244.02** Upto ø 500 mm  **SAV 244.72** Upto ø 800 mm  **SAV 244.73** Upto ø 800 mm

Operation	Workpieces	Selection Criteria	Products
Grinding vertical / horizontal	For ring shaped workpieces	• High precision • Even pole division • Flexible modification of diameter range • High stiffness • Good holding force regulation for Electro • Permanent Circular Magnets	 **SAV 244.06** Upto ø 500 mm  **SAV 244.40 /.70** Upto ø 5000 mm and bigger
	For disc shaped workpieces	• High precision • Low magnetic field height supply • Good holding force regulation for Electro • Permanent Circular Magnets • For multiple loading with small workpieces • Also for thin workpieces	 **SAV 244.02** Upto ø 500 mm  **SAV 244.41 /.72** Upto ø 1600 mm  **SAV 244.73** Upto ø 800 mm
Shoe center-less grinding	For ring shaped workpieces	• High precision • Bigger, flexible clamping range • Extreme air gap behavior	 **SAV 244.45** Upto ø 500 mm
Grinding of small parts	For instance ø 6 x 5 mm For instance ø 40 x 0,8 mm	• Extreme holding forces • High precision • High stiffness • Low magnetic field height • Fine, real pole pitch	 **SAV 244.07** Upto ø 200 mm

ELECTRO-PERMANENT CIRCULAR MAGNETS SAV 244.70

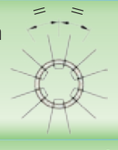
With radial poles and strong magnetic field



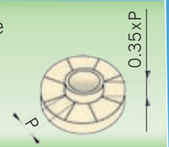
Workpiece clamping with high precision circular magnets

Execution:
- Solid constructed pole plate
- Switching off through demagnetizing cycle
- Electro-permanent system, guaranteeing safe operation during power failure
- Pole separation with brass in-lays for optimal wear behavior
- 8 mm consumption of pole plate
- Heat treated tension free body
- Available with flange on request
- Internal water cooling possible
- T-slots for pole raisers optional

- Equal pole pitch within circle range; for ring shaped workpieces



- Minimum workpiece height; 35% of the pole pitch (P) at the given pitch circle diameter



- Also for thin rings

Nominal holding force:
- 120 N/cm²
- adjustable by control unit

Nominal operating voltage:
- 210 V DC upto Ø 400 mm diameter
- 360 V DC above Ø 400 mm diameter

Application:
Mainly for precision grinding operations of small and big workpieces on rotary tables and circular grinding machines.

Dimensions in mm		Magnetic active range from Ø upto Ø in mm	Pole pairs	Weight in kg	Control unit max. current in A
Diameter	Height $^{0}_{-1}$*				
300	90	60 - 280	6	42	30
400	90	70 - 360	6	76	30
500	90	100 - 460	8	120	30
600	100	100 - 560	8	195	30
800	100	150 - 764	12	365	30
1000	100	200 - 964	12	550	60
1200	110	300 - 1150	18	990	60 x 2
1500	120	300 - 1450	18	1550	60 x 2
1600	120	300 - 1550	18	1760	60 x 2

Bigger diameters on request
* for execution with T-slots the height increases with 10 mm
Adaption to spindle according requirements

SAV 244.71

With radial poles, enhanced magnetic system and extra high holding force

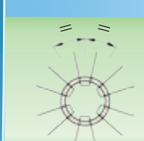
Application:
- Hard turning operations and extreme chip removal with turning of small and large workpieces
- Grinding operations with highest accuracy

Dimensions in mm		Magnetic active range from Ø upto Ø in mm	Pole pairs	Weight in kg	Control unit max. current in A
Diameter	Height $^{0}_{-1}$*				
300	100	60 - 280	6	54	30
400	100	70 - 360	6	85	30
500	110	100 - 460	8	150	30
600	110	100 - 560	8	210	30
800	110	150 - 764	12	380	30
1000	125	200 - 964	12	680	60
1200	125	300 - 1150	18	975	60 x 2
1500	135	300 - 1450	18	1850	60 x 2
1600	135	300 - 1550	18	2105	60 x 2

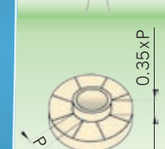
Bigger diameters on request
* for execution with T-slots the height increases with 10 mm
Adaption to spindle according requirements

Workpiece clamping with high performance circular magnets

Execution:
- Even, strong magnetic field
- Solid designed pole plate
- Switching off through demagnetizing cycle
- Electro-permanent system, guaranteeing safe operation during power failure
- Pole separation with brass in-lays for optimal wear behavior
- Also available with T-slots 10H10 for optional pole raisers for 3-side machining
- 8 mm consumption of pole plate
- Heat treated tension free body



- Equal pole pitch within circle range; therefore also suitable for ring shaped workpieces



- Minimum workpiece height; 35% of the pole pitch (P) at the given pitch circle diameter

- Also for thin rings

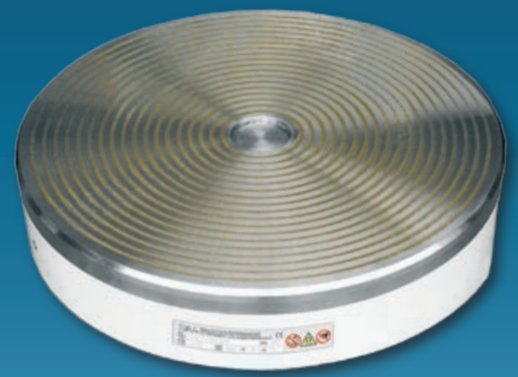
Nominal holding force:
- 170 N/cm² on inducible steel surface
- adjustable through control unit with coded switch

Nominal operating voltage:
- 360 V DC magnet voltage

ELECTRO-PERMANENT CIRCULAR MAGNETS

SAV 244.72

With concentric poles



Multiple clamping - high precision -

Execution:

- Gap free construction of pole plate
- Evenly distributed, strong magnetic field
- Solid constructed pole plate
- Switching off through demagnetizing cycle
- Electro-permanent system, guaranteeing safe operation during power failure
- Pole separation with brass in-lays for optimal wear behavior
- 8 mm consumption of pole plate

- Uniform holding force distribution due to concentric pole arrangement
- Suitable for thin and flat workpieces (e.g. saw blades)

- Multiple workpiece clamping possible on pitch circle diameter

- For workpieces with minimum thickness X:
  2 mm at pole pitch = 4.5 mm
  4 mm at pole pitch = 9 mm
  8 mm at pole pitch = 18 mm

- For thin workpieces with minimum size 45x45 mm

Application:
Mainly for precision grinding operations of small and big workpieces on rotary tables and circular grinding machines. Because of cylindrical pole arrangement it is also suitable for holding groups of randomly placed mass-production pieces.

Dimensions in mm		Magnetic active range from Ø upto Ø in mm	Weight in kg	Control unit max. current in A
Diameter	Height $^{0}_{-1}$			
300	105	60 - 280	52	30
400	105	70 - 360	89	30
500	105	100 - 460	141	30
600	105	100 - 560	204	60
800	105	150 - 764	383	60
1000	105	200 - 964	578	60
1200	125	300 - 1150	990	60 x 2
1500	125	300 - 1450	1550	60 x 2
1600	125	300 - 1550	1765	60 x 2

Available with pole pitch 4.5 mm, 9 mm and 18 mm.

Nominal holding force:

- P = 4.5 mm: 80 N/cm²
- P = 9 mm: 100 N/cm²
- P = 18 mm: 110 N/cm²
- adjustable by control unit through coded switch

Nominal operating voltage:

- 210 V DC upto Ø 500 mm diameter
- 360 V DC above Ø 500 mm diameter

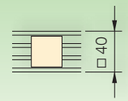
SAV 244.73

With fine pole pitch P = 4 mm

Thin parts clamped accurately !

Execution:

- Pole plate with very small, parallel pole division, 3 mm steel and 1 mm brass
- Low height
- Laminations glued and reinforced with tie bars
- Low magnetic field height; 4 mm
- Switching-off through demagnetizing cycle
- Heat treated tension free body
- Threaded mounting holes in backside. Through holes on request
- Electro-permanent system, guaranteeing safe operation during power failure
- 8 mm consumption of pole plate



- For grinding of thin plates, wide rings with low thickness and minimum width 40 mm

- For workpieces with minimum thickness 2 mm
- For flat workpieces, minimum 40x40 mm²

Application:
For grinding of thin, plate shaped workpieces.
Suitable for clamping of multiple small parts.

Dimensions in mm		Magnetic active range from Ø upto Ø in mm	Weight in kg	Control unit max. current in A
Diameter	Height $^{0}_{-1}$			
300	100	213	55	30
400	100	301	98	30
500	100	401	153	30
600	100	481	220	60
700	100	581	300	60
800	100	681	392	60

Nominal holding force:

- 100 N/cm²
- adjustable through control unit through coded switch

Nominal operating voltage:

- 360 V DC

ELECTRO CIRCULAR MAGNETS

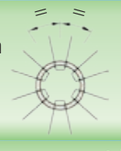
SAV 244.40

With radial poles and high holding forces

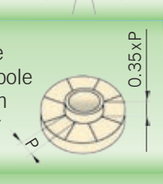
Strong and reproducible

Execution:
- Evenly distributed, strong magnetic field
- Solid constructed pole plate
- Switching off through demagnetizing
- Pole separation with brass in-lays for optimal wear behavior
- Also available with T-slots 10H10 for optional pole raisers for 3-side machining
- 8 mm consumption of pole plate
- Duty cycle 100%
- Internal water cooling possible

- Equal pole pitch within circle range; for ring shaped workpieces



- Minimum workpiece height; 35% of the pole pitch (P) at the given pitch circle diameter



- Also for thin rings

Nominal holding force:
- 120 N/cm²
- adjustable by control unit

Nominal operating voltage:
- 24 V DC upto Ø 300 mm diameter
- 110 V DC for all other sizes

Application:
For circular grinding of cylindrical and ring shaped workpieces on vertical internal and external grinding machines.
Also suitable for turning operations with form and position tolerances of 0.01 mm to 0.02 mm.

Dimensions in mm		Magnetic active range from Ø upto Ø in mm	Pole pairs	Weight in kg	Power in W
Diameter	Height $^{0}_{1}$				
300	90	60 - 280	6	42	90
400	90	70 - 360	6	76	150
500	90	100 - 460	8	120	190
600	100	100 - 560	8	195	265
800	100	150 - 764	12	365	440
1000	100	200 - 964	12	550	660
1200	110	300 - 1150	18	990	960
1500	120	300 - 1450	18	1550	1440
1600	120	300 - 1550	18	1760	1630

Bigger diameters on request

SAV 244.41

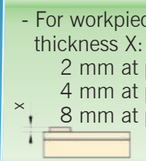
Strong and low magnetic field though concentric poles

Everything is round !

Execution:
- Pole separation with brass in-lays for optimal wear behavior
- Switching off through demagnetizing cycle
- Gap free construction of pole plate
- 8 mm consumption of pole plate
- Duty cycle 100%

- Uniform holding force distribution due to concentric pole arrangement
- Suitable for thing and flat workpieces (e.g. saw blades)

- Multiple workpiece clamping possible on pitch circle diameter



- For workpieces with minimum thickness X:
  2 mm at pole pitch = 4.5 mm
  4 mm at pole pitch = 9 mm
  8 mm at pole pitch = 18 mm

- For thin workpieces with minimum size

Nominal holding force:
- P = 4.5 mm: 80 N/cm²
- P = 9 mm: 100 N/cm²
- P = 18 mm: 110 N/cm²
- adjustable by control unit through

Nominal operating voltage:
- 24 V DC upto Ø 300 mm diameter
- 110 V DC for all other sizes

Application:
Mainly for precision grinding operations of disc shaped workpieces on rotary tables, internal and external circular grinding machines.
Not suitable for thin rings. Because of cylindrical pole arrangement it is also suitable for holding groups of randomly placed mass-production pieces.
Also for turning operations with form and position tolerances of 0.01 mm to 0.02 mm.

Dimensions in mm		Magnetic active range from Ø upto Ø in mm	Weight in kg	Power in W
Diameter	Height $^{0}_{1}$			
300	100	60 - 280	42	90
400	100	70 - 360	92	150
500	100	100 - 460	144	190
600	100	100 - 560	208	264
800	100	150 - 764	369	440
1000	100	200 - 964	577	660
1200	110	300 - 1150	989	960
1500	120	300 - 1450	1545	1440
1600	120	300 - 1550	1760	1630

Larger sizes on request.
Available with pole pitch 4.5 mm, 9 mm and 18 mm.

ELECTRO CIRCULAR MAGNETS SAV 244.43

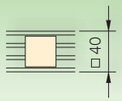
With fine pole pitch, for machining of thin parts

For universal use !

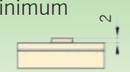
Execution:
- Pole plate with very small, parallel pole division, 3 mm steel and 1 mm brass
- Low height
- Laminations glued and reinforced with tie bars
- Low magnetic field height; 4 mm
- Switching-off through demagnetizing cycle
- Heat treated tension free body
- Threaded mounting holes in backside. Through holes on request
- 8 mm consumption of pole plate
- Robust and watertight!
- Duty cycle 100%

Application:
For grinding of thin plates, wide rings with low thickness.
Suitable for clamping of multiple small parts.

- For grinding of thin plates, wide rings with low thickness



- For workpieces with minimum thickness 2 mm
- For flat workpieces, minimum 40x40 mm



Nominal holding force:
- 100 N/cm²
- adjustable through control unit

Nominal operating voltage:
- 110 V DC

Dimensions		Magnetic active range from Ø upto Ø in mm	Weight in kg	Power in W
Diameter	Height $^{0}_{-1}$			
300	100	213	55	110
400	100	301	98	180
500	100	401	153	230
600	100	481	220	410
700	100	581	300	430
800	100	681	392	540

SLIDING SHOE GRINDING MAGNETS SAV 244.45

With pot-magnetic system for large workpiece range

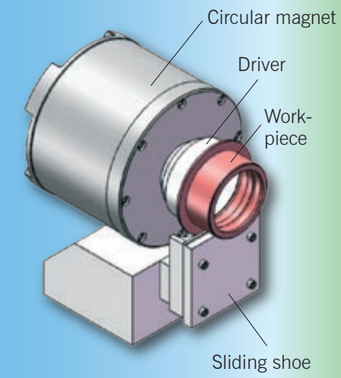
Strong – Universal – Precise !

Application:
- For grinding of small rings with limited workpiece contact surface
- Extreme low wall thickness variation through centerless workpiece clamping and positioning over static sliding shoes
- Simple changing through universal workpiece driver
- Universal use for large diameter range
- For clamping of workpieces upto Ø500 mm diameter
- Workpiece out of spindle center
- Magnet for turning movement, precision through sliding shoes

Execution:
- Extreme magnetic field for grinding of large workpiece range
- Delivery with driver according requirements
- Adaption to spindle on request
- On request with changeable pole plates for large clamping range
- For simple workpiece handling, easy automation
- Internal coolant supply possible

Nominal operating voltage, advised:
- 24 V DC upto diameter 250 mm
- 110 V DC above diameter 250 mm

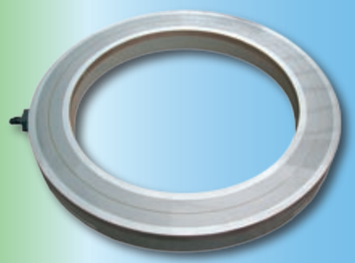
Dimensions in mm		Weight in kg	Power in W
Diameter	Height $^{0}_{-1}$		
150	130	23	25
200	130	40	40
250	160	80	62
300	160	113	90
400	180	225	140
450	180	285	180
500	200	390	250



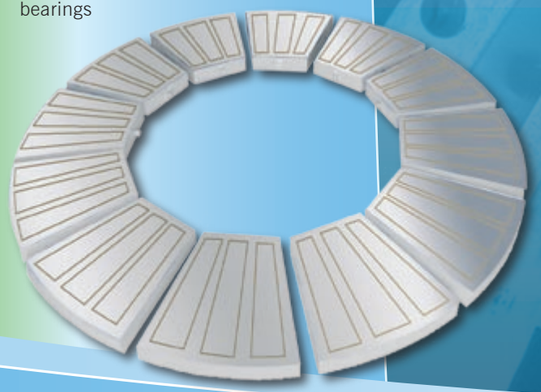
SAV SPECIAL MAGNETIC SOLUTIONS

Electro-permanent circular magnet,
combined pole division for grinding
of sleeves and plates

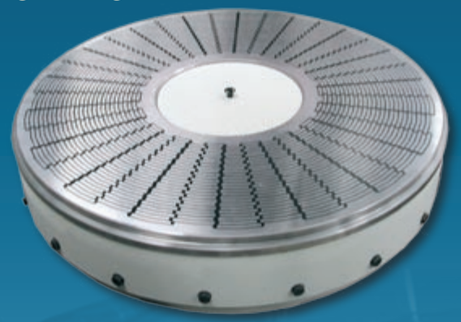
Electro-permanent ring magnet
for turbine parts

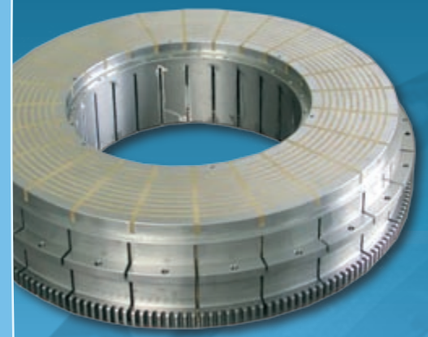


Electro circular magnet in segments,
Ø5400 mm, for machining of slewing
bearings



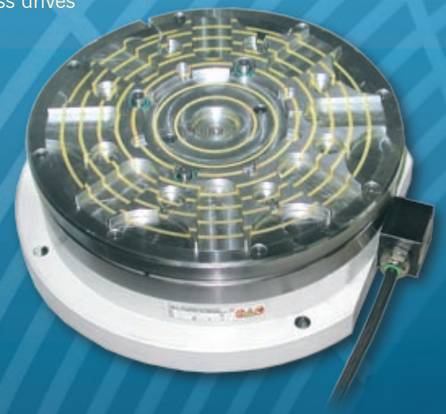
Special electromagnetic chuck
- for automatic grinding of ferrite cores
- 16 individual switchable magnetic segments





Changing pole plate in special execution
- rotating pole plate, static magnetic system
- for automatic grinding of bearing parts
- 24 individual magnetic segments

Special clamping tool for coordinate grinding
of Maltese cross drives



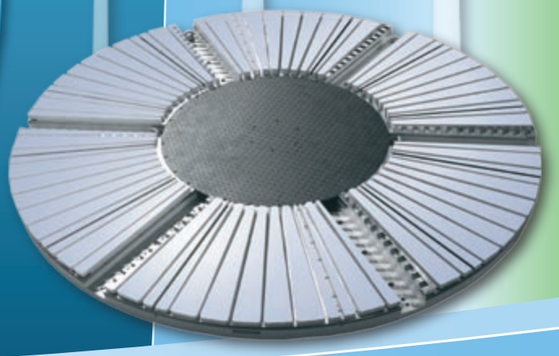
SAV LARGE MAGNET PRODUCTION

SAV magnets for machining of large parts offer:

- Accuracy and high stiffness of magnet body and pole plates, also at overhang to machine table
- Long time stability through stress-free heat treated components
- Large magnetic active ranges
- High rotation speeds
- Large magnets also in one piece
- Very small magnetic “dead” zones
- High quality on evenness and parallelism according requirements
- Individual spindle adaption
- Extreme large diameters, for instance Ø 12 m, in segment construction

ø 3200 mm

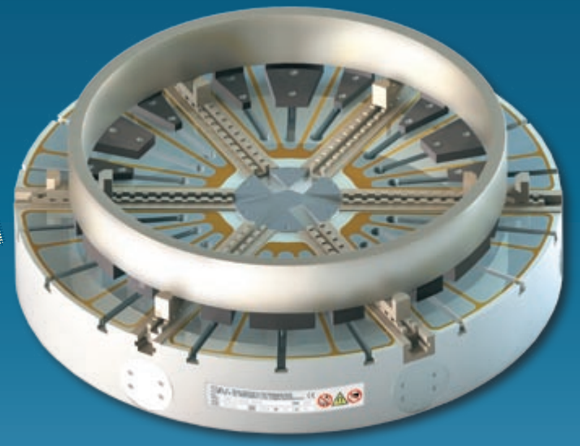
ø 3600 mm



SAV MECHATRONIC CHUCK SAV 244.75

The clever combination !

PATENT PENDING



Combination circular magnet – electric linear axis:

- Servo drive with integrated brakes
- 300 daN clamping force per actuator at Ø1000 mm
- Direct measuring system with resolution 0.001 mm
- 50 mm clamping stroke with quick change jaws
- Electronic centrifugal force compensation
- Enhanced magnetic system with optimized pole division
- Magnetic material under each pole for minimum field heights
- Ø350 mm minimum magnetic area
- Smallest chuck diameter Ø800 mm at 100 daN clamping force per jaw
- With 165 mm minimum height
- Available end 2010

Application:

- For automation
- Precise centering, reproducible with high accuracy
- High power chip removal and finishing
- Combination first and second set-up
- Clamping radial and/or axial
- Clamping of eccentric parts

Variant A

- 3 Axis centric
- 3 Axis internal or external engaging

Variant D

- Manual workpiece positioning with dial gauge
- Magnetic pre-clamping
- 6 axis individual engaging and clamping

Variant B

- 6 axis centric
- internal or external engaging

Variant E

Centric per 2 facing axis

Variant C

Clamping of oval parts

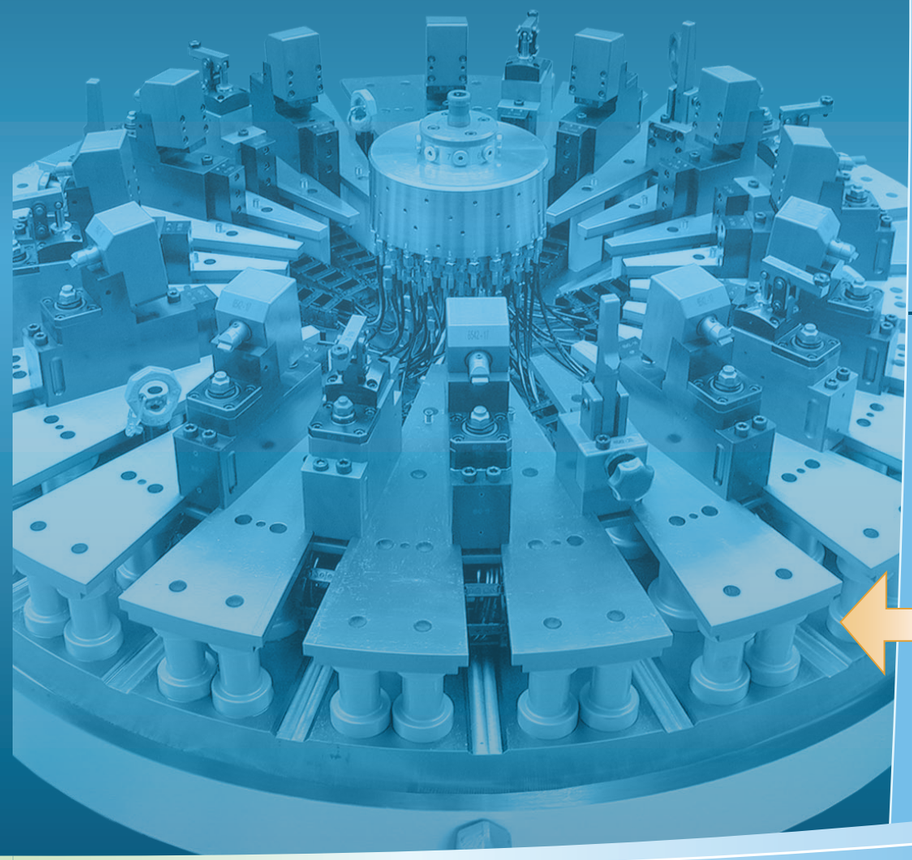
Variant F

Clamping external parts at changing positioning to spindle

SPECIAL COMBINED CHUCK SAV 244.99

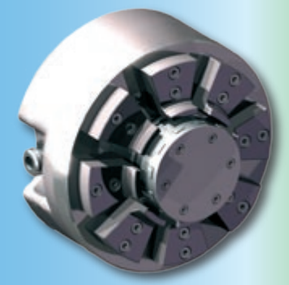
Combined solutions can be applied usefully when:

- Full surface and/or selective power introduction is required for the same workpiece
- Changing devices are applied
- High accurate centering possibilities are required
- Extreme chip removal at small workpiece dimensions must be realized
- Combined clamping axial / vertical is required

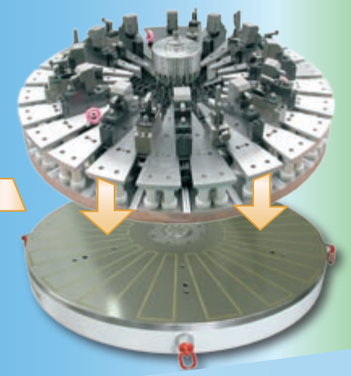


Electro-permanent magnet with mechanic centering system on pole raisers

Combined chuck from high energy magnet and precision lamination-centering



Special clamping device Ø1400 mm on electro-permanent magnet, radial and axial grinding of rings



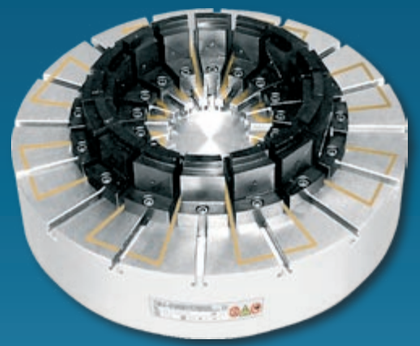
SAV POLE RAISERS

Fixed pole raisers
with positioning collar

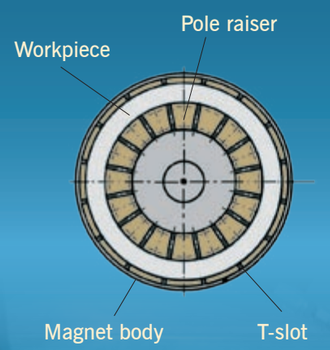
Execution:

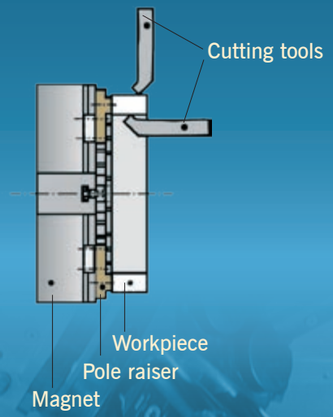
- Pole raisers in segmented execution ensure an undisturbed tool path for 3 side machining of thin rings
- Through the radial adjustment a larger diameter range can be covered
- Cut-outs for uneven workpieces or for through holes possible
- Depending on workpiece stiffness also flexible pole raisers for uneven clamping surfaces
- The pole raisers for circular magnets must be adjusted individually
- We design and produce pole raisers for special solutions on request.

Pole raisers for turning applications



Application:
Hard turning of thin roller bearing rings on 3 sides with fixed and movable pole raisers

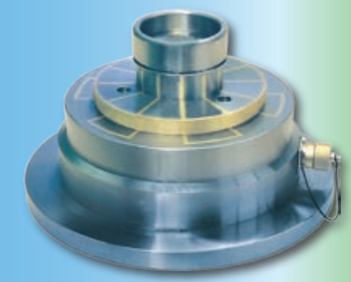




SAV TOP TOOLING

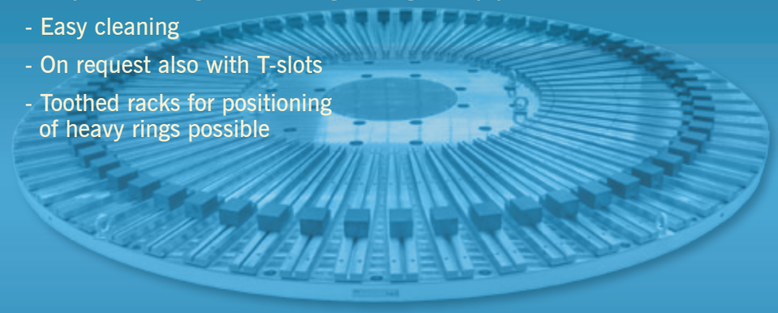
ADAPTER POLE PLATES

- No loss of workpiece contact surface
- Good holding forces also with smaller diameters
- Easily changeable
- Good chip removal, easy to clean
- Pre-setting of pole raisers outside the machine
- Pole plate changing can be automated
- Also with T-slots for pole raisers



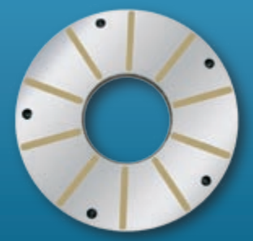
POLE BEAMS

- As protection against wearing of magnet top plate
- Easy cleaning
- On request also with T-slots
- Toothed racks for positioning of heavy rings possible



ADAPTER POLE RINGS

- Upto diameter Ø650 mm
- No loss of workpiece contact surfaces
- Profiling possible
- Good holding forces, also at smaller diameters
- Easily changeable
- Economic



SAV CONTROL TECHNOLOGY

SAV 876.12 ELECTRONIC POLARITY REVERSING CONTROL UNIT

Features:

- small and compact
- easy to integrate in any machine
- operator-friendly through LCD clear text display and foil keys
- reliable and safe

Use:

For electro-permanent magnetic clamping systems. Also suitable for retrofitting.

Operation through remote control unit or PLC signals.

Function:

Electronic polarity reversing control units are used as impulse-control for electro-permanent magnetic chucks

For your safety, the unit permanently monitors the current source, its own power components and all connection cables including magnet coil.

Machine release through safety contact

Holding force regulation through coded switch.

Control unit
SAV 876.10

Advantages:

- Short circuit proof
- Fully electronic
- Extended diagnostics
- Monitoring of short circuit to ground
- Very compact design
- Pre-programmed settings
- Individual programmability
- Automatic mains-frequency recognition
- Functional design and operation guide

SAV 876.12 for electro-permanent magnets

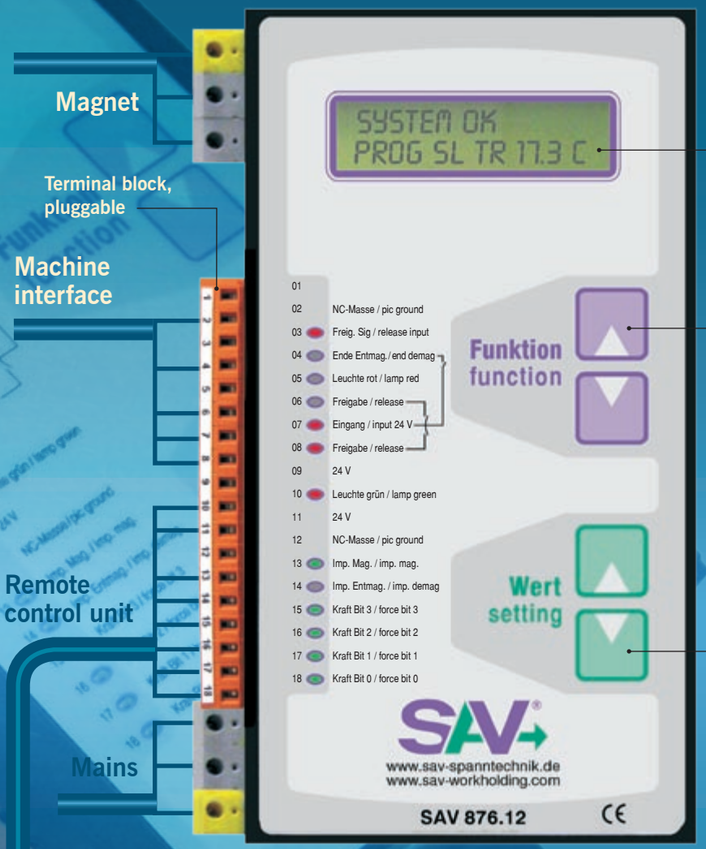
Ordering no.	Dimensions in mm			Weight in kg	Magnet voltage DC in V	Magnet current in A	Mains voltage AC in V
	Length	Width	Depth				
876.12-E-O-210/30/230	220	120	95	2	210	30	230
876.12-E-O-210/30/400	260	120	95	3	210	30	400
876.12-E-O-360/30/400	320	120	95	3	360	30	400
876.12-E-O-360/60/400	400	120	95	5	360	60	400
876.12-E-O-360/60x2/400	540	120	95	6	360	60x2	400

On request also available in separate box (876.12-S-O-...)

SAV 876.10 for electro magnets

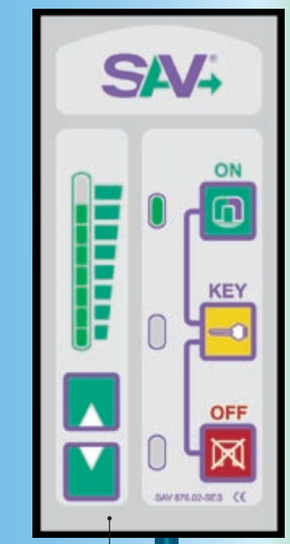
876.10-E-T-24/ 7 /230	220	120	95	2	24	7	230
876.10-E-T-24/15/230	260	120	95	3	24	15	230
876.10-E-O-110/ 6 /230	220	120	95	2	110	6	230
876.10-E-O-110/16/230	260	120	95	3	110	16	230

CE-conformity according Machine, Low-Voltage and EMC Directives.



Compact
User friendly
Reliable

Remote control unit SAV 876.02-SE3



Panel suitable for integration in machine console

SAV ELECTRIC SUPPLY FOR CIRCULAR MAGNETS

Separated slip ring body SAV 248.81

power supply for electro circular magnets

Dimensions in mm		Magnet voltage in V	Number of contacts	Max r.p.m.	Weight in kg
Diameter	Length				
bis 300	40	24	2	3600	1.1
bis 900	61.5	110	3	3200	2.0
bis 1600	84.0	110	3	2500	3.5

Application:

Slip ring bodies are used in combination with carbon brush holders for power supply.
For separate mounting to the hollow machine spindle.
Suitable protection must be provided to prevent contact with live components.

Execution:

The slip ring body is supplied with a small through-hole only. This can be machined (for instance with thread) on request to suit the machine spindle.

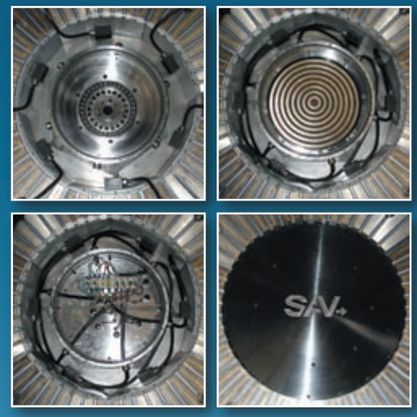
Separated slip ring body SAV 248.85

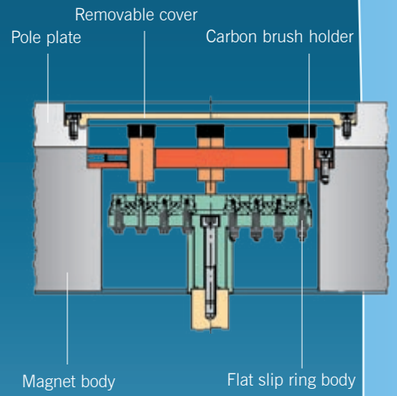
power supply for electro-permanent circular magnets

Dimensions in mm		Magnet voltage in V	Number of contacts	Max r.p.m.	Weight in kg
Diameter	Length				
bis 800	61.5	210/360	3	4100	1.1
bis 1000	65.5	360	3	3000	2.5
bis 1600	79.0	360	4	3000	3.0

Power supply for large circular magnets

With integrated flat slip ring body for large magnets on vertical spindle machines





Application:

For circular magnets with diameter bigger than Ø1000 mm.

Execution:

Completely integrated in the magnet.
Adaption to spindle on request.

Carbon brush holder SAV 248.83

power supply for electro circular magnets

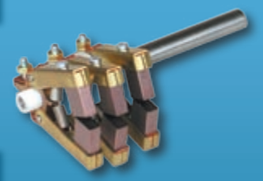
Dimensions in mm			Magnet voltage in V	Number of contacts	Weight in kg
Diameter	Length	Width			
bis 300	140	40	24	2	0.10
bis 900	140	40	110	3	0.17
bis 1600	140	60	110	3	0.20

Application:

For power supply on the slip ring body. The carbon brush holders are supplied in 3 sizes including mounting bar.

Execution:

Carbon brushes, spring loaded.
Mounting over spacer bolts



Carbon brush holder SAV 248.84

power supply for electro-permanent circular magnets

Dimensions in mm			Magnet voltage in V	Number of contacts	Weight in kg
Diameter	Length	Width			
bis 800	140	40	210/360	3	0.10
bis 1000	140	40	360	3	0.17
bis 1600	140	60	360	4	0.23

Power supply for electro-permanent circular magnets

With industrial watertight connector; for magnetizing and demagnetizing, removed during machining (only for electro-permanent magnets)

Bayonet quick lock

Application:

- Protection IP65
- with quick locking for simple handling

Electro-permanent circular chuck
- for combined circular grinding / turning machine
- changeable magnet / 3-jaw chuck
- combined drawing bar / power supply and internal coolant supply

Electro-permanent circular magnet
with radial poles, changeable.

Contact flange

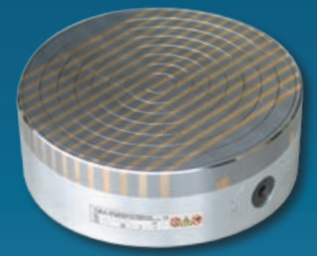
Spring loaded contacts
with coolant supply

Electro-permanent circular magnet
changeable at spindle, for hard turning operation and extreme rotation speeds upto 3000 r.p.m.
Electric connection through spring loaded contacts.

SAV PERMANENT CIRCULAR MAGNETS SAV 244.02

With parallel pole arrangement, enhanced magnetic system

Application:
Sizes A = 100 to 160 mm
for grinding
Sizes A = 200 to 500 mm
for turning and grinding



Dimensions in mm		Pole pitch steel/brass	Switching positions	Weight in kg
Diameter	Height $^{+0.5}_{-2}$			
100	62	4/1.5 2/1.5	1	3
130	62	4/1.5 2/1.5	1	5
160	75	6/5	1	8
200	80	8/5	1	13
250	80	8/5	1	20
300	85	8/5	1	29
350	85	8/5	1	40
400	100	8/5	1	59
450	100	8/5	2	70
500	100	8/5	2	90

Magnetic field height : 10 mm

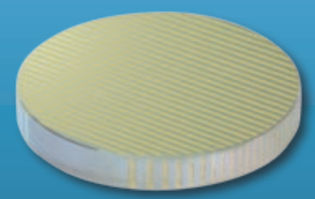
Pole plate wearing limit : 8 mm

SAV LAMINATED TOP PLATES SAV 248.01

For use on circular magnets with parallel pole arrangement

Application:
For clamping of profiled workpieces on magnets with parallel pole arrangement.

Pole pitch: Steel 3 mm
Brass 1 mm
Machining depth: 8 mm



Dimensions in mm		Weight in kg
Diameter	Height $^{+0.5}_{-2}$	
155	25	4
200	25	6
250	25	10
300	25	14

Dimensions in mm		Weight in kg
Diameter	Height $^{+0.5}_{-2}$	
350*	25	19
400*	30	30
450*	30	38
500*	30	47

*available on request

Execution:
- Exceptional strong magnetic field
- Concentric grooves simplify centering of the workpiece
- Also available with flange

Nominal holding force:
- 70 N/cm² for diameter Ø100 – 160 mm
- 140 N/cm² for diameter Ø200 – 500 mm

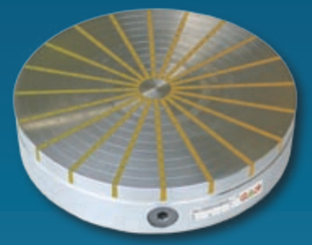
Execution:
- Can be machined to any required shape, or custom machined during manufacture
- Mounting on magnetic chuck to be agreed upon
- Lamination must be parallel to magnetic chuck

SAV PERMANENT CIRCULAR MAGNETS SAV 244.06

With radial poles

Application:
For cylindrical and ring shaped workpieces, for grinding and hard turning.

Pole plate wearing limit:
- 5 mm for A = 100 to 300 mm
- 10 mm for A = 350 to 400 mm

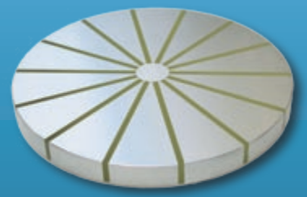


Dimensions in mm		Non-magnetic center in mm	Number of poles	Weight in kg
Diameter	Height $^{+0.5}_{-2}$			
100	48	14	6	3
130	57	16	10	6
150	57	20	10	8
200	57	28	12	14
250	70	30	16	27
300	73	40	16	41
350	73	40	20	55
400	75	40	20	75

SAV LAMINATED TOP PLATES SAV 248.05

With radial poles

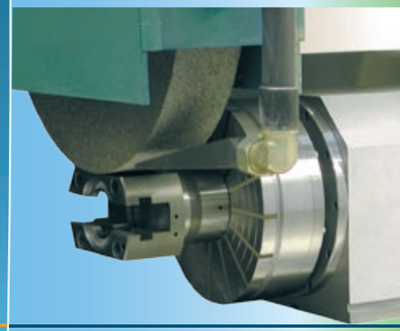
Application:
For use on circular magnet SAV 244.06 with radial poles.



Dimensions in mm		Number of poles	Weight in kg
Diameter	Height $^{+0.5}_{-2}$		
150	20	10	3
200	20	12	5
250	20	16	8
300	25	16	14
350	25	20	19
400	25	20	24.5

Execution:
- High magnetic force
- Concentric grooves simplify centering of the workpiece
- Standard execution without center through hole. Possible on request.
- Bigger diameters available with T-slots
- Also available with flange on request

Nominal holding force:
- 100 N/cm²



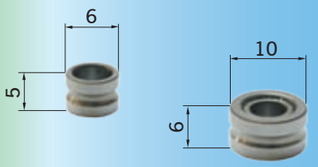
Execution:
- For clamping of profiled workpieces
- Mounting on magnetic chuck to be agreed upon
- Profile depth: max. 8 mm.

Strongest forces for smallest parts !

Execution:

- Housing from aluminum, pole plate made from stainless steel.
- Extreme high holding force through a specially developed construction using Neodymium-Iron-Boron magnets.
- Also available with flange on request
- Magnetic field height : 4 mm
- Pole plate wearing limit : 3 mm

Nominal holding force:
180 N/cm² on inducible steel surface

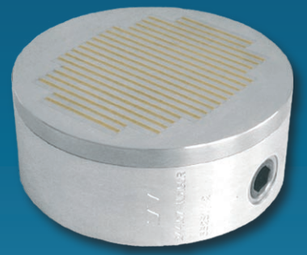


Also suitable for parts with 0.8 mm thickness

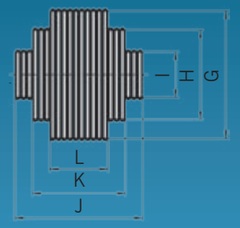
SAV NEODYMIUM CIRCULAR MAGNETS SAV 244.07

With parallel pole arrangement P = 6 mm, Neodymium magnets with extreme high holding force

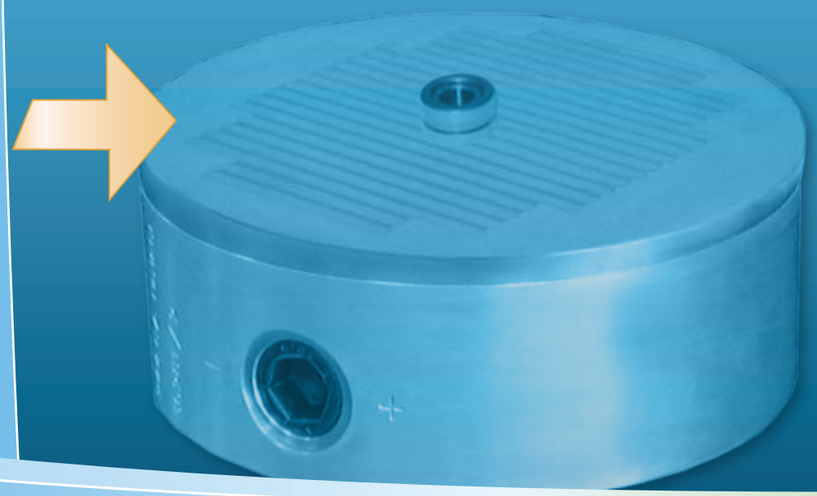
Application:
For workpieces that are particularly difficult to clamp, such as ferrotic and hard metals with cobalt content.
For very small and smallest workpieces.



Pole configuration



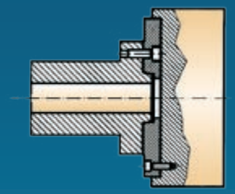
Dimensions in mm								Weight in kg
Diameter	Height $^{+0.5}_{-2}$	G	H	I	J	K	L	
100	65	-	-	48	-	-	74	2
125	65	-	88	54	-	98	67	3
160	65	-	104	54	-	134	61	4.5
180	65	124	84	64	134	97	61	6.5
200	65	134	104	74	158	110	73	8.5



SAV FLANGES

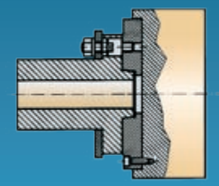
Short taper adapter flanges SAV 248.90
without mounting bolts

Application:
Mounting of circular magnets or other clamping tools. For spindle noses according DIN 55026 (55021) Form A and B, ISO 702/I A1 and A2, ASA B5.9 A1 and A2.



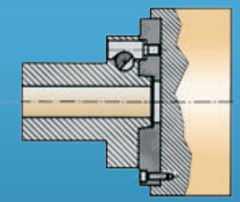
Short taper adapter flanges SAV 248.91
with bayonet ring fixing
with studs and collar nuts

Application:
Mounting of circular magnets or other clamping tools. For spindle noses according DIN 55022 and ISO 702/III.



Short taper adapter flanges SAV 248.92
with camlock fixing

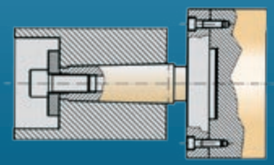
Application:
Mounting of circular magnets or other clamping tools. For spindle noses according DIN 55029 and ISO 702/II, ASA b5.9 D1.



Morse taper adapter SAV 248.94

Application:
Mounting of circular magnets or other clamping tools. For morse taper sockets according DIN 228.

Pulling thread possible according requirements.



Execution:

Soft steel flanges according:

- DIN,
- ISO and
- ASA standard

Machined on spindle side. The adaption to magnet or chuck according requirements (please indicate diameter and hole pattern when ordering)

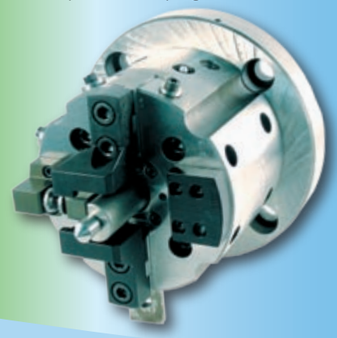
We supply our circular magnets completely mounted to flanges on request.

SAV HYDRAULIC-MECHANIC CLAMPING SYSTEMS

Column chuck
- Ø165 upto Ø400 mm
- for heavy chip removal

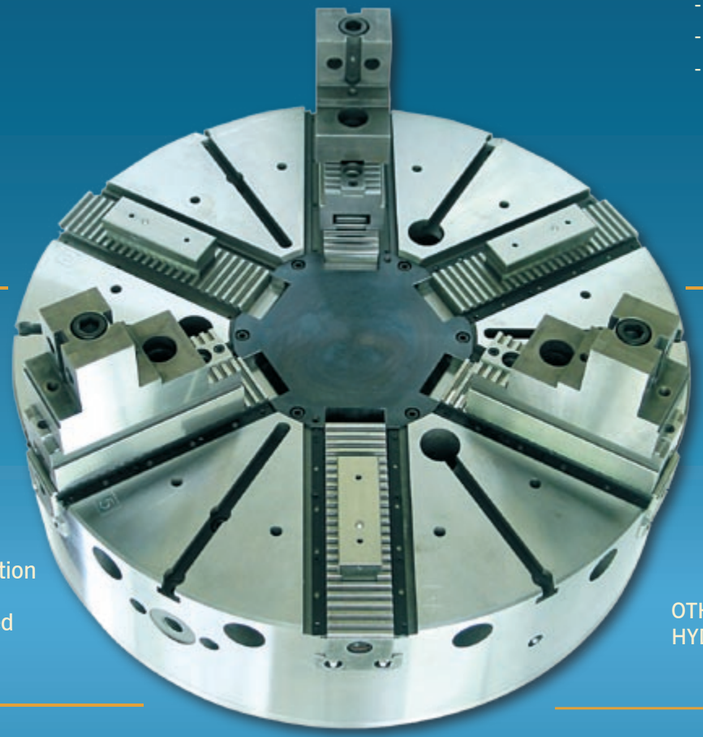
Centering and face clamping chuck
- Ø165 upto Ø500 mm
- for fine turning applications

Compensating chuck
- Ø165 upto Ø400 mm
- 2 jaws with spring loaded centering pin for clamping with offset



2+2 jaw chucks
- Ø165 upto Ø500 mm
- 2x centric operation
- axial pressing and radial positioning device

6 jaw lever compensating chuck
- Ø200 upto Ø1480 mm
- for clamping of rings without deformation
- base jaw sealed
- pendular compensation can be blocked

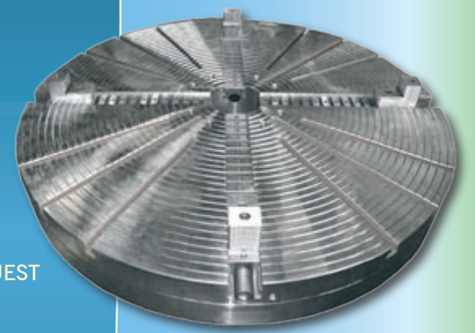


Rotary finger chuck
- ø 165 upto 400 mm
- Precise centering in tooth system
- Supporting and clamping in bore with miniature clamping fingers for highest precision

OTHER DIAMETERS FOR
HYDRAULIC-MECHANIC CHUCKS ON REQUEST

Face clamping finger chuck
- Ø165 upto Ø500 mm
- radial relocation
- integrated supporting elements for damping

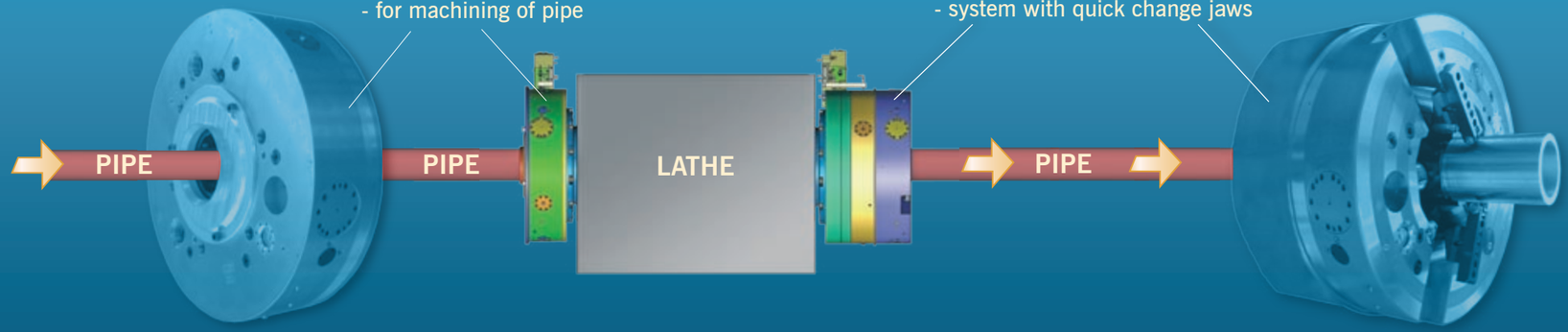
Face plate
- Ø500 – Ø2000 mm
- with torque amplifier



Special clamping fixture
in special execution for face machining

Rear chuck
- Ø820 mm
- for machining of pipe

Front chuck
- Ø1140 mm
- system with quick change jaws



WORKHOLDING

Contents

TURNING
HARD TURNING
CIRCULAR GRINDING

Turning

Grinding

Shoe centerless grinding

SAV NUREMBERG

Germany Headquarters
Sales and marketing – Germany, Austria, Switzerland

SAV Spann- Automations-Normteiletechnik GmbH
Schießplatzstraße 36+38a
D-90469 Nuremberg
Germany
Tel.: +49 - 911 - 9483-0
Fax: +49 - 911 - 4801426
Email: info@sav-spanntechnik.de

SAV PRODUCTION

SAV Production GmbH Nuremberg-Eibach
Gundelfinger Straße 8
D-90469 Nuremberg-Eibach
Germany

F&K Prototyping and Erosion Technology
Leipziger Straße 31
D-09648 Mittweida
Germany

PARTEC Automation Technology and Handling Systems
Leipziger Straße 29
D-09648 Mittweida
Germany

SAV Mittweida GmbH
Leipziger Straße 29-31
D-09648 Mittweida
Germany

EMATECH GmbH
Electronic and magnetic technology
Luitpoldstraße 32
D-87700 Memmingen
Germany

SAV INTERNATIONAL BRANCH OFFICES

Czech Republic
Sales and Marketing – Central and Eastern Europe

SAV CZECH spol. s. r. o.
Kotojedy 56
CZ-767 01 Kroměříž
Czech Republic
Tel.: +420 - 573 - 334 062

Poland
Sales and Marketing – Poland

SAV POLSKA sp. z o.o
ul. Hetmańska 38
PL-85-039 Bydgoszcz
Poland
Tel.: +48 - 52 321 91 40

The Netherlands
Sales and Marketing – International
SAV Workholding and Automation
Steenenstraat 8
NL-3262 JM Oud-Beijerland
The Netherlands
Tel.: +31 - 186 - 626 469

North-America
Sales and Marketing – North America
SAV-North America Inc.
250 Nutmeg Road South, STE N
South Windsor, CT 06074, U.S.A.
Tel.: +1 - 860 - 882 - 0841

China
Sales and Marketing – Asia
SAV-Asia (in progress)
Hong Kong / Guangzou

WORKHOLDING AND AUTOMATION

DESIGN
DEVELOPMENT
PRODUCTION
SALES
SERVICE

SAV Spann- Automations-Normteiletechnik GmbH
Schießplatzstraße 36+38a
D-90469 Nuremberg
Germany
Tel.: +49 - 911 - 9483 - 0
Fax: +49 - 911 - 4801426
Email: info@sav-workholding.com
www.sav-workholding.com