WORKHOLDING FOR ROTARY OPERATIONS
YEARS

25

SUPERIOR TECHNOLOGY

IN ROTARY WORKHOLDING

MATNETIC
HYDRAULIC
MECHANIC
VACUUM

market
LEADER
FOR highest performance
AND QUALITY
The requirements of our customers determine our products and the company philosophy.

<table>
<thead>
<tr>
<th>GUARANTEES</th>
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<tbody>
<tr>
<td>Quality, reliability and longevity</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
<tr>
<td>Precision solutions</td>
</tr>
<tr>
<td>Problem solving competence</td>
</tr>
<tr>
<td>From Workpiece to Process – Handling and Automation</td>
</tr>
<tr>
<td>The right principle: magnetic, hydraulic, mechanic, vacuum</td>
</tr>
<tr>
<td>Flexibility of design manufactured in SAV factory</td>
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<tr>
<td>Innovation – new technologies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ELECTROMAGNETIC AND ELECTRO-PERMANENT MAGNETIC CHUCKS WITH DEMAGNETIZING CYCLE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PRECISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADE IN GERMANY</td>
</tr>
</tbody>
</table>

### 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

**SAV** 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**

**PRECISION**

**MADE IN GERMANY**

**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

**TOP QUALITY WORKHOLDING**

- 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
**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

<table>
<thead>
<tr>
<th>Form- resp. surface quality</th>
<th>Reproducible quality magnetic chuck</th>
<th>Potential improvement *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetical inside roughness</td>
<td>0.3 µm</td>
<td>0% to 25%</td>
</tr>
<tr>
<td>Circular form difference</td>
<td>0.5 µm</td>
<td>75% to 90%</td>
</tr>
<tr>
<td>Cylindrical form failure</td>
<td>10 µm</td>
<td>80% to 85%</td>
</tr>
<tr>
<td>Wall thickness variation</td>
<td>25 µm</td>
<td>60% to 80%</td>
</tr>
</tbody>
</table>

* potential improvement in comparison with conventional methods

**SAV MAGNETS FOR CIRCULAR AND CENTERLESS GRINDING**

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
- Precision clamping with point supports / point clamping, no pull-down of uneven parts
- Shaft clamping with centre offset
- Clamping of rings without deformation
- Fine turning operations

**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

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

Electromagnetic circular chuck Ø 500 mm for shoe centerless grinding applications

3-jaw Tipping Lever Chuck for gear box flanges
### Magnetic Workholding – Selection Criteria

<table>
<thead>
<tr>
<th>Operation</th>
<th>Workpieces</th>
<th>Selection Criteria</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning / Hard turning – Vertical spindle</td>
<td>For disc shaped workpieces</td>
<td>• High forces at low magnetic field height</td>
<td>SAV 244.70 / .71 Upto ø 5000 mm and bigger</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Safety and independence of electrical supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High rotation speed range</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High holding forces</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High rotation speed range</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Even pole division at perimeter</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Flexible modification of diameter range</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Safety and independence of electrical supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High stiffness for machining of large parts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Simple energy supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Holding force regulation of EP magnets for centering of workpieces possible</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding vertical / horizontal</td>
<td>For disc shaped workpieces</td>
<td>• High precision</td>
<td>SAV 244.02 Upto ø 500 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low magnetic field height supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Good holding force regulation for Electro</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Permanent Circular Magnets</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For multiple loading with small workpieces</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Also for thin workpieces</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoe centerless grinding</td>
<td>For ring shaped workpieces</td>
<td>• High precision</td>
<td>SAV 244.45 Upto ø 500 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bigger, flexible clamping range</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Extreme air gap behavior</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinding of small parts</td>
<td>For disc shaped workpieces</td>
<td>• Extreme holding forces</td>
<td>SAV 244.07 Upto ø 200 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High precision</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• High precision</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High stiffness</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low magnetic field height</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fine, real pole pitch</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For disc shaped workpieces</td>
<td>For instance ø 40 x 0.8 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For ring shaped workpieces</td>
<td>For instance ø 6 x 5 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Workholding and Automation

SAV Spann-Automations-Normteiletechnik GmbH • www.sav-spanntechnik.de

SAV Workholding and Automation • www.sav-workholding.com
**ELECTRO-PERMANENT CIRCULAR MAGNETS**

**SAV 244.70**

**With radial poles and strong magnetic field**

**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

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

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnetic active range from Ø upto Ø in mm</th>
<th>Pole pairs</th>
<th>Weight in Kg</th>
<th>Control unit max. current in mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>Height in mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>90</td>
<td>6</td>
<td>42</td>
<td>30</td>
</tr>
<tr>
<td>400</td>
<td>90</td>
<td>6</td>
<td>76</td>
<td>30</td>
</tr>
<tr>
<td>500</td>
<td>90</td>
<td>8</td>
<td>120</td>
<td>30</td>
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<tr>
<td>600</td>
<td>100</td>
<td>8</td>
<td>195</td>
<td>30</td>
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<tr>
<td>800</td>
<td>100</td>
<td>12</td>
<td>365</td>
<td>30</td>
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<tr>
<td>1000</td>
<td>100</td>
<td>12</td>
<td>580</td>
<td>30</td>
</tr>
<tr>
<td>1200</td>
<td>110</td>
<td>18</td>
<td>990</td>
<td>60.2 x 2</td>
</tr>
<tr>
<td>1500</td>
<td>120</td>
<td>18</td>
<td>1850</td>
<td>60.2 x 2</td>
</tr>
<tr>
<td>1600</td>
<td>120</td>
<td>18</td>
<td>1760</td>
<td>60.2 x 2</td>
</tr>
</tbody>
</table>

**SAV 244.71**

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

**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
- 8 mm consumption of pole plate
- Heat treated tension free body
- Available with T-slots for 3-side machining
- 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

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

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnetic active range from Ø upto Ø in mm</th>
<th>Pole pairs</th>
<th>Weight in Kg</th>
<th>Control unit max. current in mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>Height in mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>100</td>
<td>6</td>
<td>54</td>
<td>30</td>
</tr>
<tr>
<td>400</td>
<td>100</td>
<td>6</td>
<td>85</td>
<td>30</td>
</tr>
<tr>
<td>500</td>
<td>110</td>
<td>8</td>
<td>150</td>
<td>30</td>
</tr>
<tr>
<td>600</td>
<td>110</td>
<td>8</td>
<td>210</td>
<td>30</td>
</tr>
<tr>
<td>800</td>
<td>110</td>
<td>12</td>
<td>380</td>
<td>30</td>
</tr>
<tr>
<td>1000</td>
<td>125</td>
<td>12</td>
<td>680</td>
<td>60</td>
</tr>
<tr>
<td>1200</td>
<td>125</td>
<td>18</td>
<td>975</td>
<td>60 x 2</td>
</tr>
<tr>
<td>1500</td>
<td>135</td>
<td>18</td>
<td>1850</td>
<td>60 x 2</td>
</tr>
<tr>
<td>1600</td>
<td>135</td>
<td>18</td>
<td>2100</td>
<td>60 x 2</td>
</tr>
</tbody>
</table>

**Nominal holding force:**
- 120 N/cm² - adjustable by control unit
- Equal pole pitch within circle range; therefore also suitable for ring shaped workpieces

**Nominal operating voltage:**
- 210 V DC upto Ø 400 mm diameter
- 170 N/cm² on inducible steel surface - adjustable through control unit with coded switch
- 360 V DC magnet voltage

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* For execution with T-slots the height increases with 10 mm Adaption to spindle according requirements.
**ELECTRO-PERMANENT CIRCULAR MAGNETS**

### SAV 244.72

**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.

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>Magnetic active range from Ø up to Ø in mm</th>
<th>Height in mm</th>
<th>Control unit max. current in A</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>105</td>
<td>60 - 280</td>
<td>52</td>
</tr>
<tr>
<td>400</td>
<td>105</td>
<td>70 - 360</td>
<td>82</td>
</tr>
<tr>
<td>500</td>
<td>105</td>
<td>100 - 460</td>
<td>141</td>
</tr>
<tr>
<td>600</td>
<td>105</td>
<td>100 - 560</td>
<td>204</td>
</tr>
<tr>
<td>800</td>
<td>105</td>
<td>150 - 764</td>
<td>383</td>
</tr>
<tr>
<td>1000</td>
<td>100</td>
<td>200 - 864</td>
<td>578</td>
</tr>
<tr>
<td>1200</td>
<td>125</td>
<td>300 - 1150</td>
<td>990</td>
</tr>
<tr>
<td>1500</td>
<td>125</td>
<td>300 - 1450</td>
<td>1760</td>
</tr>
</tbody>
</table>

Available with pole pitch 4.5 mm, Ø 8 mm and 18 mm.

### SAV 244.73

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

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>Magnetic active range from Ø up to Ø in mm</th>
<th>Height in mm</th>
<th>Control unit max. current in A</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>100</td>
<td>213</td>
<td>55</td>
</tr>
<tr>
<td>400</td>
<td>100</td>
<td>301</td>
<td>98</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>401</td>
<td>153</td>
</tr>
<tr>
<td>600</td>
<td>100</td>
<td>481</td>
<td>220</td>
</tr>
<tr>
<td>700</td>
<td>100</td>
<td>581</td>
<td>300</td>
</tr>
<tr>
<td>800</td>
<td>100</td>
<td>681</td>
<td>392</td>
</tr>
</tbody>
</table>

For thin workpieces, minimum 45x45 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
- Through holes on request
- Electro-permanent system, guaranteeing safe operation during power failure
- 8 mm consumption of pole plate

**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**

- **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.

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Height</th>
<th>Magnetic active range from Ø upto Ø</th>
<th>Pole pairs</th>
<th>Weight in kg</th>
<th>Power in W</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>90</td>
<td>60 - 280</td>
<td>6</td>
<td>42</td>
<td>90</td>
</tr>
<tr>
<td>400</td>
<td>90</td>
<td>70 - 380</td>
<td>6</td>
<td>76</td>
<td>150</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>100 - 500</td>
<td>8</td>
<td>120</td>
<td>190</td>
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<td>600</td>
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<td>800</td>
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<td>100 - 764</td>
<td>12</td>
<td>365</td>
<td>440</td>
</tr>
<tr>
<td>1000</td>
<td>100</td>
<td>200 - 964</td>
<td>12</td>
<td>580</td>
<td>660</td>
</tr>
<tr>
<td>1200</td>
<td>110</td>
<td>300 - 1150</td>
<td>18</td>
<td>990</td>
<td>960</td>
</tr>
<tr>
<td>1500</td>
<td>120</td>
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<td>18</td>
<td>1550</td>
<td>1440</td>
</tr>
<tr>
<td>1600</td>
<td>120</td>
<td>300 - 1550</td>
<td>18</td>
<td>1760</td>
<td>1630</td>
</tr>
</tbody>
</table>

**Strong and low magnetic field though concentric poles**

**SAV 244.41**

- **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.

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnetic active range from Ø upto Ø</th>
<th>Pole pitch in mm</th>
<th>Weight in kg</th>
<th>Power in W</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>100</td>
<td>60 - 280</td>
<td>42</td>
<td>90</td>
</tr>
<tr>
<td>400</td>
<td>100</td>
<td>70 - 380</td>
<td>76</td>
<td>150</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>100 - 500</td>
<td>120</td>
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<tr>
<td>600</td>
<td>100</td>
<td>100 - 500</td>
<td>195</td>
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<tr>
<td>800</td>
<td>100</td>
<td>100 - 764</td>
<td>365</td>
<td>440</td>
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<td>200 - 964</td>
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<td>1200</td>
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<td>1500</td>
<td>120</td>
<td>300 - 1450</td>
<td>1550</td>
<td>1440</td>
</tr>
<tr>
<td>1600</td>
<td>120</td>
<td>300 - 1550</td>
<td>1760</td>
<td>1630</td>
</tr>
</tbody>
</table>

**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

**Execution:**
- Evenly distributed, strong magnetic field
- Solid constructed pole plate
- Switching off through demagnetizing cycle
- 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

**Bigger diameters on request.**

**Larger sizes on request.**

Available with pole pitch 4.5 mm, 9 mm and 18 mm.
**ELECTRO CIRCULAR MAGNETS**

**SAV 244.43**

With fine pitch, for machining of thin parts

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Magnetic active range from Ø up to Ø in mm</th>
<th>Weight in kg</th>
<th>Power in W</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>100</td>
<td>213</td>
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</tr>
<tr>
<td>800</td>
<td>100</td>
<td>681</td>
<td>392</td>
</tr>
</tbody>
</table>

**SAV 244.45**

With pot-magnetic system for large workpiece range

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Weight in kg</th>
<th>Power in W</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>130</td>
<td>23</td>
</tr>
<tr>
<td>200</td>
<td>130</td>
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</tr>
<tr>
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<td>285</td>
</tr>
<tr>
<td>500</td>
<td>200</td>
<td>350</td>
</tr>
</tbody>
</table>

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

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

**Nominal operating voltage:**
- 110 V DC

---

**SLIDING SHOE GRINDING MAGNETS**

**SAV Workholding and Automation** • **www.sav-workholding.com**

**Execution:**
- For grinding of thin plates, wide rings with low thickness
- For workpieces with minimum thickness 2 mm
- For flat workpieces, minimum 40x40 mm
- Extreme magnetic field for grinding of large workpiece range
- Delivery with driver according to 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

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Weight in kg</th>
<th>Power in W</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>130</td>
<td>23</td>
</tr>
<tr>
<td>200</td>
<td>130</td>
<td>40</td>
</tr>
<tr>
<td>250</td>
<td>160</td>
<td>80</td>
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<td>180</td>
<td>225</td>
</tr>
<tr>
<td>450</td>
<td>180</td>
<td>285</td>
</tr>
<tr>
<td>500</td>
<td>200</td>
<td>350</td>
</tr>
</tbody>
</table>

**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 up to Ø500 mm diameter
- Workpiece out of spindle center
- Magnet for turning movement, precision through sliding shoes

**Nominal operating voltage, advised:**
- 24 V DC up to diameter 250 mm
- 110 V DC above diameter 250 mm

---

**For universal use!**

- 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.

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

**Nominal operating voltage:**
- 110 V DC

---

**For workpieces with minimum thickness 2 mm**

**For flat workpieces, minimum 40x40 mm**

**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%
SAV SPECIAL MAGNETIC SOLUTIONS

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

**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

**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

**SAV LARGE MAGNET PRODUCTION**

**Electro-permanent ring magnet for turbine parts**

**Special clamping tool for coordinate grinding of Maltese cross drives**

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

**Electro-circular magnet in segments, Ø3200 mm**
The clever combination!

**SAV MECHATRONIC CHUCK**  SAV 244.75

**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

**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 B**
- 6 Axis centric
- Internal or external engaging

**Variant C**
- Clamping of oval parts

**Variant D**
- Manual workpiece positioning with dial gauge
- Magnetic pre-clamping
- 6 Axis individual engaging and clamping

**Variant E**
- Centric per 2 facing axis

**Variant F**
- Clamping external parts at changing positioning to spindle

**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 B**
- 6 Axis centric
- Internal or external engaging

**Variant C**
- Clamping of oval parts

**Variant D**
- Manual workpiece positioning with dial gauge
- Magnetic pre-clamping
- 6 Axis individual engaging and clamping

**Variant E**
- Centric per 2 facing axis

**Variant F**
- Clamping external parts at changing positioning to spindle

**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**

**PATENT PENDING**
**SAV POLE RAISERS**

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

**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 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

**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
SAV STEUERUNGS-TECHNIK

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 876.10-E-T-24/7/230 220 120 95 2 210 30 230
SAV 876.10-E-T-24/15/230 220 120 95 3 210 30 230
SAV 876.10-E-O-110/6/230 220 120 95 2 110 6 230
SAV 876.10-E-O-110/16/230 220 120 95 3 110 16 230

SAV 876.12 for electro-permanent magnets

<table>
<thead>
<tr>
<th>Ordering no.</th>
<th>Dimensions in mm</th>
<th>Weight in kg</th>
<th>Magnet voltage AC in V</th>
<th>Magnet current in A</th>
<th>Mains voltage AC in V</th>
</tr>
</thead>
<tbody>
<tr>
<td>876.12-E-O-210/30/230</td>
<td>220 120 95</td>
<td>2</td>
<td>210</td>
<td>30</td>
<td>230</td>
</tr>
<tr>
<td>876.12-E-O-210/30/400</td>
<td>220 120 95</td>
<td>3</td>
<td>210</td>
<td>30</td>
<td>400</td>
</tr>
<tr>
<td>876.12-E-O-360/30/400</td>
<td>320 120 95</td>
<td>3</td>
<td>360</td>
<td>30</td>
<td>400</td>
</tr>
<tr>
<td>876.12-E-O-360/60/400</td>
<td>400 120 95</td>
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<td>360</td>
<td>60</td>
<td>400</td>
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<tr>
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<td>540 120 95</td>
<td>6</td>
<td>360</td>
<td>60x2</td>
<td>400</td>
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SAV 876.12 for electro magnets

<table>
<thead>
<tr>
<th>Ordering no.</th>
<th>Dimensions in mm</th>
<th>Weight in kg</th>
<th>Magnet voltage AC in V</th>
<th>Magnet current in A</th>
<th>Mains voltage AC in V</th>
</tr>
</thead>
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<td>876.12-E-O-210/30/230</td>
<td>220 120 95</td>
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<td>24</td>
<td>7</td>
<td>230</td>
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<tr>
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<td>220 120 95</td>
<td>3</td>
<td>24</td>
<td>15</td>
<td>230</td>
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<tr>
<td>876.12-E-O-360/60/230</td>
<td>320 120 95</td>
<td>2</td>
<td>110</td>
<td>6</td>
<td>230</td>
</tr>
<tr>
<td>876.12-E-O-360/60x2/400</td>
<td>400 120 95</td>
<td>3</td>
<td>110</td>
<td>16</td>
<td>230</td>
</tr>
</tbody>
</table>

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.

SAV CONTROL TECHNOLOGY

Use:
For electro-permanent magnetic clamping systems. Also suitable for retrofitting.
Operation through remote control unit or PLC signals.

SAV 876.12 for electro-permanent magnets

SAV 876.10 for electro magnets

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

SAV WORKHOLDING AND AUTOMATION

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.

SAV 876.12 Compact
SAV 876.12 User friendly
SAV 876.12 Reliable

SAV WORKHOLDING AND AUTOMATION

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

SAV WORKHOLDING AND AUTOMATION

SAV WORKHOLDING AND AUTOMATION
SAV ELECTRIC SUPPLY FOR CIRCULAR MAGNETS

### Separated slip ring body SAV 248.81
**power supply for electro circular magnets**

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnet voltage in V</th>
<th>Number of contacts</th>
<th>Max r.p.m.</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>bis 300</td>
<td>40</td>
<td>24</td>
<td>2</td>
<td>3600</td>
</tr>
<tr>
<td>bis 900</td>
<td>110</td>
<td>11</td>
<td>3</td>
<td>3000</td>
</tr>
<tr>
<td>bis 1600</td>
<td>110</td>
<td>11</td>
<td>3</td>
<td>2500</td>
</tr>
</tbody>
</table>

### Separated slip ring body SAV 248.85
**power supply for electro-permanent circular magnets**

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnet voltage in V</th>
<th>Number of contacts</th>
<th>Max r.p.m.</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>bis 800</td>
<td>61.5</td>
<td>210/360</td>
<td>3</td>
<td>4100</td>
</tr>
<tr>
<td>bis 1000</td>
<td>65.5</td>
<td>360</td>
<td>3</td>
<td>3000</td>
</tr>
<tr>
<td>bis 1600</td>
<td>79.0</td>
<td>360</td>
<td>4</td>
<td>3000</td>
</tr>
</tbody>
</table>

### Carbon brush holder SAV 248.83
**power supply for electro circular magnets**

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnet voltage in V</th>
<th>Number of contacts</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>bis 300</td>
<td>40</td>
<td>24</td>
<td>0.10</td>
</tr>
<tr>
<td>bis 900</td>
<td>40</td>
<td>11</td>
<td>0.17</td>
</tr>
<tr>
<td>bis 1600</td>
<td>60</td>
<td>11</td>
<td>0.20</td>
</tr>
</tbody>
</table>

### Carbon brush holder SAV 248.84
**power supply for electro-permanent circular magnets**

<table>
<thead>
<tr>
<th>Dimensions in mm</th>
<th>Magnet voltage in V</th>
<th>Number of contacts</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>bis 800</td>
<td>40</td>
<td>210/360</td>
<td>0.10</td>
</tr>
<tr>
<td>bis 1000</td>
<td>40</td>
<td>360</td>
<td>0.17</td>
</tr>
<tr>
<td>bis 1600</td>
<td>60</td>
<td>360</td>
<td>0.23</td>
</tr>
</tbody>
</table>

### Power supply for electro-permanent circular magnets

- Protection IP65
- With quick locking for simple handling

---

**Application:**
- Slip ring bodies are used in combination with carbon brush holders for power supply.
- 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.
- For power supply on the slip ring body. The carbon brush holders are supplied in 3 sizes including mounting bar.
- Carbon brushes, spring loaded. Mounting over spacer bolts.

**Application:**
- Protection IP65
- With quick locking for simple handling

---

**Power supply for large circular magnets**

**Application:**
- For circular magnets with diameter bigger than Ø1000 mm.

**Execution:**
- Completely integrated in thermagnet. Adaption to spindle on request.

**Application:**
- Protection IP65
- With quick locking for simple handling

---

**Electro-permanent circular magnet**
- Changeable at spindle, for hard turning operation and extreme rotation speeds up to 3000 r.p.m.
- Electric connection through spring loaded contacts.
SAV PERMANENT CIRCULAR MAGNETS

**SAV 244.02**

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

- **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

- **Magnetic field height:** 10 mm
- **Pole plate wearing limit:** 8 mm

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Height</th>
<th>Pole pitch</th>
<th>Switching</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>62</td>
<td>4/1.5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>130</td>
<td>62</td>
<td>4/1.5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>160</td>
<td>65</td>
<td>6/5</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>200</td>
<td>80</td>
<td>8/5</td>
<td>1</td>
<td>13</td>
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<tr>
<td>250</td>
<td>80</td>
<td>8/5</td>
<td>1</td>
<td>20</td>
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<td>300</td>
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<td>8/5</td>
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<td>400</td>
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<tr>
<td>450</td>
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<td>8/5</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>8/5</td>
<td>2</td>
<td>90</td>
</tr>
</tbody>
</table>

**SAV LAMINATED TOP PLATES**

**SAV 248.01**

- **Application:**
  - For use on circular magnets with parallel pole arrangement

- **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

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Height</th>
<th>Pole pitch</th>
<th>Switching</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>25</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>200</td>
<td>25</td>
<td>6</td>
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<td>6</td>
</tr>
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<td>250</td>
<td>25</td>
<td>10</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>300</td>
<td>25</td>
<td>14</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

**SAV PERMANENT CIRCULAR MAGNETS**

**SAV 244.06**

- **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

- **Nominal holding force:**
  - 100 N/cm²

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Height</th>
<th>Non-magnetic center in mm</th>
<th>Number of poles</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>48</td>
<td>14</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>130</td>
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<tr>
<td>400</td>
<td>75</td>
<td>40</td>
<td>20</td>
<td>75</td>
</tr>
</tbody>
</table>

**SAV LAMINATED TOP PLATES**

**SAV 248.05**

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

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

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Height</th>
<th>Number of poles</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>20</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>200</td>
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<tr>
<td>250</td>
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<td>8</td>
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<tr>
<td>300</td>
<td>25</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>350</td>
<td>25</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>400</td>
<td>25</td>
<td>20</td>
<td>24.5</td>
</tr>
</tbody>
</table>

**Dimensions in mm**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Height</th>
<th>Number of poles</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>25</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>200</td>
<td>25</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>250</td>
<td>25</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>300</td>
<td>25</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

*Available on request*
SAV NEODYMIUM CIRCULAR MAGNETS

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/mm² on inducible steel surface

Also suitable for parts with 0.8 mm thickness

Strongest forces for smallest parts!

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

SAV 244.07

SAV FLANGES

Short taper adapter flanges 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.

SAV 248.90

Short taper adapter flanges 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.

SAV 248.92

Short taper adapter flanges 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.

SAV 248.83

Morse taper adapter

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

SAV 248.94

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.

Pole configuration

Dimensions in mm

<table>
<thead>
<tr>
<th>Diameter</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>Weight (in kg)</th>
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<td>-</td>
<td>48</td>
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<td>65</td>
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<td>158</td>
</tr>
</tbody>
</table>

SAV Workholding and Automation • www.sav-workholding.com

SAV Spann-Automations-Normteiletechnik GmbH • www.sav-spanntechnik.de
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 chucks
- 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 hexi compensating chuck
- Ø200 upto Ø1480 mm
- for clamping of rings without deformation
- base jaw sealed
- pendular compensation can be blocked

Front chuck
- Ø820 mm
- for machining of pipe

Rear chuck
- Ø820 mm
- for machining of pipe

Face plate
- Ø500 – Ø2000 mm
- with torque amplifier

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

Special clamping fixture
in special execution for face machining

Other diameters for hydraulic-mechanic chucks on request

Other diameters for hydraulic-mechanic chucks on request

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