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<td>SAV – The company</td>
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<td>09 - 16</td>
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<td>Dressing devices</td>
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<td>Zero settlers</td>
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<td>Roller blocks</td>
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CATALOGUE IX

CIRCULAR GRINDING AND DRESSING
INDEXING DEVICES

AUXILIARY DEVICES FOR MACHINE TOOLS
THE PARTNER FOR:

- Workholding technologies
  - Magnetic-hydraulic-mechanical-vacuum
- Stationary and rotary workholding
  - All technologies
- Heavy lifting systems
- Automation
- Standard parts
- Special applications
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www.group-sav.com
Catalogue IX 5
Leading in technology –
Not just a catch phrase for SAV

Research and development is the basis of our success. We develop magnetic, hydraulic, mechanical and vacuum technology solutions for our customers as well as tools and prototypes according to our customer’s specifications. We have a network of approximately 25 CAD workstations at several locations. All of them are equipped with 3D-systems and FEM programmes for magneto-static, thermal, static and dynamic analyses.

The engineering of standard and special solutions

Our engineering department is specialised in the development and engineering of rotary workholding solutions. Our high levels of expertise enable us to implement your specific requirements. Our many years of experience in the area of special-, workholding and lifting system solutions are integrated into the development of our standard products to ensure optimal results and the highest possible flexibility in their application.
The production of standard and special solutions

Our products are manufactured in our state-of-the-art production facilities which are designed for various production processes. 5-Axis milling, circular and surface grinding, wire cutting and sinking operations are carried out in our own production facilities.

In order that we are able to offer our customers excellent levels of product quality, our quality control management procedures are certified annually (ISO 9001/2010).

We manufacture globally. Our main production facilities are located in Nuremberg, Mittweida and Göppingen in Germany. Naturally, our standard products are employed in our own production processes. This enables our experienced development team to continually monitor and improve the product specifications which provides a practical benefit to our customers.

Our production facilities

- 55 CNC-machining centres up to 5000 mm machining length and 3000 mm in width
- 2 CNC Gantry milling machines
  Gantry range 3 m, table length 5 m
- 4 HSC 5 axis milling machines
- 50 profile / surface / coordinate / circular (internal and outside) grinding machines up to 4000 mm machining length.
- Magnet test bench up to 50,000 kg
- 12 wire cutting and sinker EDM machines
- 4 CNC horizontal lathes
- 1 large horizontal lathe
  Face plate diameter 3000 mm
- 4 coordinate measuring machines
  Range: x = 600 mm, y = 1000 mm, z=465 mm
- 1 injection moulding machine
### PRODUCT OVERVIEW

<table>
<thead>
<tr>
<th>SAV-ART.-NO.</th>
<th>DESCRIPTION</th>
<th>COMMENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAV 434.01</td>
<td>Precision Radius Dresser</td>
<td>For profiling grinding wheels</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to 400 mm diameter</td>
<td></td>
</tr>
<tr>
<td>SAV 434.02</td>
<td>Precision Radius Dresser</td>
<td>For profiling grinding wheels, universal</td>
<td>11</td>
</tr>
<tr>
<td>SAV 434.03</td>
<td>Precision Angle Dresser</td>
<td>For angle dressing of grinding wheels, with graduated scale</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and vernier</td>
<td></td>
</tr>
<tr>
<td>SAV 434.05</td>
<td>Precision Angle Dresser</td>
<td>For angle dressing of grinding wheels according to the sine</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>principle</td>
<td></td>
</tr>
<tr>
<td>SAV 434.06</td>
<td>Precision Side-Face Dresser</td>
<td>For dressing the side faces of grinding wheels</td>
<td>14</td>
</tr>
<tr>
<td>SAV 434.07</td>
<td>Precision Punch Former</td>
<td>For grinding of punches and profiling of grinding wheels</td>
<td>15</td>
</tr>
<tr>
<td>SAV 401.01</td>
<td>Dressing Diamonds</td>
<td>Accessories</td>
<td>16</td>
</tr>
</tbody>
</table>
For profiling grinding wheels

**Application:**
With this radius dressing device, grinding wheels of up to ø 400 mm, with concave and convex radii, can be profiled.

**Features:**
The lapped, robust spindle runs in a honed bore and is sealed against dust. With graduated angular scale. The radius movement is limited by adjustable end stops. The height of the arm with the diamond dresser can be set by means of a threaded adjustor. With the help of a fine adjusting screw on the arm, the diamonds can be brought into the correct position with high precision. The precision radius dressing device is supplied with 3 replaceable dressing sets and dressing arm "2".

Optionally, two additional arms with larger machining radius ranges are available. Arm 3 with 100 mm raiser foot for dressing larger radius ranges.

**Accessories:**
- Dressing diamond SAV 401.01 K 10, Type D
- Arm 1 - SAV 434.01 - 1
- Arm 3 - SAV 434.01 - 3

Both supplied at a surcharge.

### Examples of profiled grinding wheels.

<table>
<thead>
<tr>
<th>Arm</th>
<th>Machining radius concave mm</th>
<th>Machining radius convex mm</th>
<th>Arm length A mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19 - 112</td>
<td>-</td>
<td>143</td>
</tr>
<tr>
<td>2*</td>
<td>0 - 22 / 108 - 155</td>
<td>0 - 25</td>
<td>143</td>
</tr>
<tr>
<td>3</td>
<td>151 - 199</td>
<td>21 - 68</td>
<td>158</td>
</tr>
</tbody>
</table>

* included in the delivery

Ordering example:
- **Precision Radius Dressing Device** SAV 434.01
- **Designation** SAV - No.
Ordering example:

Precision Radius Dressing Device  SAV 434.02
Designation  SAV - No.

Axis height in mm  62
Max. machining radius
- concave: in mm  26
- convex: in mm  16
max. grinding wheels - ø in mm  200
Bore hole for diamond in mm  6
Adjustment range in mm ± 15
Weight in kg  4.1

Examples of profiled grinding wheels
For angle dressing of grinding wheels

**Application:**
Using this tool grinding wheels can be simply dressed and cut back in any angle or shape. For dressing of straight, angled and side faces. For grinding end faces, slots and precise angled surfaces.

**Features:**
Can be tilted over 90° in both directions from the vertical position. Adjustable using graduated scale.

Adjustable application head for the diamond. Diameter 6 mm, stroke 10 mm SAV 439.60. Included in the delivery.

**Accessories:**
Dressing diamond SAV 401.01 - 06. Supplied at a surcharge.

---

**Base area approx. in mm**
- **max. stroke:** 60
- **Bore hole for diamond:** 6
- **Weight in kg:** 4.1
- **Swivel range in °:** ± 90

---

**Ordering example:**
Precision Angle Dressing Device SAV 434.03
Designation SAV - No.
PRECISION ANGLE DRESSING DEVICE

SAV 434.05

Ordering example:

Precision Angle Dressing Device | SAV 434.05 - 100
Designation | SAV - No. - max. dressing range

For angle dressing of grinding wheels

**Application:**
For precise dressing of grinding wheels on flat grinding machines using the sine principle.

**Features:**
All parts hardened to HRC 60 and precision ground. The start position of the dresser is 45 degrees.
Angular precision: 5 sec.

**Accessories:**
Dressing diamond for SAV 434.05 - 45:
SAV 401.01 - K 10
Dressing diamond for SAV 434.05 - 100:
SAV 401.01 - MK 1
Supplied at a surcharge.

**Application:**
The required angle is adjusted using end-gauges according to the table supplied. (Sine principle).

<table>
<thead>
<tr>
<th>Max. dressing range</th>
<th>45</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base plate B x C in mm</td>
<td>140 x 70</td>
<td>245 x 78</td>
</tr>
<tr>
<td>Height D - E in mm</td>
<td>142 - 172</td>
<td>232 - 302</td>
</tr>
<tr>
<td>Carriage width F in mm</td>
<td>40</td>
<td>48</td>
</tr>
<tr>
<td>Start position in °</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Overall adjustment range in °</td>
<td>0 - 90</td>
<td>0 - 90</td>
</tr>
<tr>
<td>Distance between axes G in mm</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>ø for dressing diamond in mm</td>
<td>6,2 / 1:10</td>
<td>MK 1</td>
</tr>
<tr>
<td>Weight in kg</td>
<td>4,75</td>
<td>13,5</td>
</tr>
</tbody>
</table>

SAV 434.05 - 45
Dressing range: 45 mm

SAV 434.05 - 100
Dressing range: 100 mm
**For dressing the side faces of grinding wheels**

**Application:**
For dressing the side faces of grinding wheels; for grinding slots.
Setting range from 0.5 to 50 mm.

**Features:**
Made from hardened tool steel HRC 60.
Available with (K) or without (N) cooling system upon request.

**Accessories:**
Dressing diamond
SAV 401.01 - 08, Type D
Supplied at a surcharge.

**Ordering example:**
Precision side-face dresser SAV 434.06 - K,
Type PWA 28 - K, with cooling system

Precision side-face dresser SAV 434.06 - N,
Type PWA 28, in standard execution without cooling system

<table>
<thead>
<tr>
<th>Base plate</th>
<th>in mm</th>
<th>190 x 72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>in mm</td>
<td>115</td>
</tr>
<tr>
<td>Setting range</td>
<td>in mm</td>
<td>0.5 - 50</td>
</tr>
<tr>
<td>max. wheel thickness</td>
<td>in mm</td>
<td>50</td>
</tr>
<tr>
<td>Feed per revolution</td>
<td>in mm</td>
<td>1</td>
</tr>
<tr>
<td>Feed per scale division</td>
<td>in mm</td>
<td>0.01</td>
</tr>
<tr>
<td>Bore hole for diamond</td>
<td>in mm</td>
<td>8</td>
</tr>
<tr>
<td>Weight</td>
<td>in kg</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**Ordering example:**
Precision side-face dresser SAV 434.06 - K
Designation SAV - No. - Execution
PRECISION PUNCH FORMER

SAV 434.07

For grinding of punches and profiling of grinding wheels

Application:
For the high-precision grinding of punches and the profiling of grinding wheels.

Features:
Made completely of steel to the highest precision. All parts are hardened and ground. Radius dressing arm for grinding wheels up to 200 mm diameter supplied as standard.

Usage:
The adjustable stops and a stop pin make it possible to set any required angle. In order to achieve the highest possible holding force, the stops are clamped to a conical rail.
The setting screw is used for uncomplicated setting of the V-block support. Any required angle can be set using the adjustable stops, stop pin and the gauge, according the sine principle.
The V-block is guided in a T-slot, positioned in the middle of the indexing plate.
A single bolt clamps the V-block in all positions without tolerance variance. Index pin and index disc with 24 notches and 15 degree graduations with an accuracy of ± 30 sec.
Equipped with handle for easy turning of index disc. Through hole 30 mm for long punches.
The L-shaped execution of the base provides the device with additional stability and stiffness.

Accessories:
Angular dressing bracket: SAV 434.07 - 01
Dressing diamond: SAV 401.01 - 10 - 92
Both supplied at a surcharge.

Examples of finished punches.

Examples of profiled grinding wheels (*Angular dressing bracket required)

Ordering example:
Precision punch former  SAV 434.07
Designation  SAV - No.

<table>
<thead>
<tr>
<th>Width</th>
<th>Overall height</th>
<th>Height to centre</th>
<th>Depth</th>
<th>Length of V-block</th>
<th>Clamping range V-block Ø</th>
<th>Max. machining radius:</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>132</td>
<td>76.2</td>
<td>202</td>
<td>40</td>
<td>4 - 25</td>
<td>- concave 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- convex 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>max. machining length 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aperture for diamond 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Weight 5</td>
</tr>
</tbody>
</table>

Radius dressing arm for grinding wheels up to 200 mm diameter included in the delivery.
DRESSING DIAMONDS

to dress grinding discs

Application:
For use with dressing tools and punch formers.

Dressing diamond SAV 401.01 - 10 - 92:
Suitable for the precision, universal, dresser SAV 434.04 and precision punch former: SAV 434.07.
Diameter: 10 mm
Quality: 0,5 Carat

Dressing diamond SAV 401.01 - 10 - 40:
Suitable for the precision, universal, dresser SAV 434.04.
Diameter: 10 mm
Quality: 0,5 Carat

Dressing diamond SAV 401.01 - 08:
Suitable for the side-face dresser SAV 434.06.
Diameter: 8 mm
Quality: 0,25 Carat

Dressing diamond SAV 401.01 - MK1:
Suitable for the precision, angle dresser SAV 434.05 - 100.
Diameter: 12,065 mm
Morse taper: MK 1
Quality: 0,5 Carat

Dressing diamond SAV 401.01 - K10:
Suitable for the grinding disc dressing device SAV 434.05 - 45 and SAV 434.01.
Diameter: 6,2 mm
Taper ratio: 1 : 10
Quality: 0,5 Carat

Dressing diamond SAV 401.01 - 06:
Suitable for the grinding disc dressing device SAV 434.03 and SAV 434.02.
Diameter: 6 mm
Quality: 0,5 Carat

Ordering example:
Dressing diamond SAV 401.01 - 06
Designation SAV - No. - Type
## PRODUCT OVERVIEW

### INDEXING HEADS

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<th>PAGE</th>
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<td>SAV 434.47</td>
<td>Digital, precision indexing head</td>
<td>with sine setting with encoder and display unit</td>
<td>18</td>
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<tr>
<td>SAV 434.49</td>
<td>Vice indexing head</td>
<td>for collets according to DIN 6388 and Type ER</td>
<td>19</td>
</tr>
<tr>
<td>SAV 207.11</td>
<td>Precision clamping blocks</td>
<td>to clamp round parts</td>
<td>20</td>
</tr>
</tbody>
</table>
DIGITAL, PRECISION INDEXING HEAD

SAV 434.47

With encoder and display unit

**Application:**
For indexing.

Indexing head with digital display unit (SAV 877.41, included in delivery). Swivel range up to 90 degrees.

For the measurement of complicated workpieces. Due to its compact size the unit can be used at any time with the minimum of set-up effort.

Digital display unit: Heidenhain Type ND 281.
Encoder: Heidenhain RON 455 B.

**Features:**
The base plate, the angle plate and wear-parts are hardened. The bearing is splash-proof.
- compact construction, safety class IP 54
- high divisional accuracy, zero-point setting
- easy maintenance and cleaning
- unobstructed view of the workpiece
- Sine swivel range 0 - 90 degrees
- Spindle Mounting MT 4

Other mountings and executions on request.

**Accessories:**
- Round magnets ø 100
- 3- and 4-jaw chucks ø 80 and ø 100
- Mandrels
- Special mounting fixtures

**Technical Data:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (in mm)</td>
<td>ca. 180</td>
</tr>
<tr>
<td>Width (in mm)</td>
<td>ca. 140</td>
</tr>
<tr>
<td>Height horizontal (in mm)</td>
<td>ca. 180</td>
</tr>
<tr>
<td>Height vertical (in mm)</td>
<td>ca. 190</td>
</tr>
<tr>
<td>Spindle height (in mm)</td>
<td>ca. 122</td>
</tr>
<tr>
<td>Base plate (in mm)</td>
<td>140 x 130</td>
</tr>
<tr>
<td>Weight (in kg)</td>
<td>ca. 15</td>
</tr>
<tr>
<td>Angle setting range (°)</td>
<td>0 - 90</td>
</tr>
<tr>
<td>Subdivision (°)</td>
<td>0 - 360</td>
</tr>
<tr>
<td>Spindle concentricity (mm)</td>
<td>0,003</td>
</tr>
<tr>
<td>Resolution (°)</td>
<td>0,01</td>
</tr>
<tr>
<td>Spindle Mounting (°)</td>
<td>MK 4</td>
</tr>
</tbody>
</table>

**Ordering example:**

Digital, precision indexing head
Designation: SAV 434.47
SAV - No.
Features:
Made from tool steel, hardened and with all angles and faces precision ground. Readings via a graduated vernier scale. With M28 through-bore.
Robust and durable in service due to the precise plain bearings.
Raster-indexation 15° and 90°.
Upon request with base plate (GP) and adjustable stop (A).
Clamping for 90°.
M28 through-bore.
Supplied in a storage case.
Division accuracy ≤ 0.1°
Concentricity: 0.01 mm

Application:
Simple and secure clamping of round workpieces without damaging the surfaces. By using the indexing head an extra axis is provided to clamp the machine tool. Sealed and therefore suitable for EDM operations.

Benefits:
Low set-up costs as the vice does not have to be removed from the machining table. Milling machine collets may be used.

**Collet type**

<table>
<thead>
<tr>
<th>Collet type</th>
<th>Dimensions in mm</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF ø 2 - 16 DIN 6388</td>
<td>A: 80</td>
<td>B: 80</td>
</tr>
<tr>
<td>HF ø 2 - 25 DIN 6388</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>ER 25 ø 1 - 16 430 E</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>ER 32 ø 2 - 20 470 E</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>ER 40 ø 2 - 26 472 E</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>HF ø 10 - 32 DIN 6388</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>ER 50 ø 10 - 34 477 E</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>

Ordering example:
Vice indexing head SAV 434.49 - ER 50 - 34
Designation SAV - No. - Collet Type
**PRECISION CLAMPING BLOCKS**

**SAV 207.11**

To clamp round parts

**Application:**
For simple, quick and secure clamping of punches and round parts on which, for instance, 3, 4 or 6 surfaces must be ground, eroded or milled.

**Features:**
- Precision ground on all sides. Made of tool steel hardened to 60 HRC.
- Collet mountings suitable for Deckel collets with retaining thread S 20 x 2 mm and Schaublin 470E (ER32)
- Suitable for clamping directly on a magnetic chuck or in machine vice.

The following collets are not included in the delivery:
- SAV 439.66 - 355 E
- SAV 439.67 - 470 E

Collet mountings:
- Deckel 355 E (D)
- Schaublin 470 E (Sch)

**Angular precision:** 3 sec.
**Plane parallelism:** 0,003 / 100 mm
**Weight PSV 10 / D / Sch:** 1,6 kg / 2,15 kg
**Weight PSV 20 / D / Sch:** 1,4 kg / 1,85 kg

**Precision clamping block**

**Designation**

SAV 207.11 - PSV 10 - D

**SWIVEL MAGNETS AND FIXTURES**

**In special executions**

Construction and assembly of magnets or special fixtures with base plates and tailstocks for standard-indexers with control units.

**Dual axis indexer**

with 4 NC-axes
## PRODUCT OVERVIEW

<table>
<thead>
<tr>
<th>SAV-ART.-NO.</th>
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<tr>
<td><strong>CIRCULAR GRINDING DEVICES</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SAV 434.80</td>
<td>Precision sine circular grinder</td>
<td>Complete with tailstock, adjustable according to the sine principle</td>
<td>22</td>
</tr>
<tr>
<td>SAV 434.81</td>
<td>Precision sine circular grinder</td>
<td>With sine setting</td>
<td>23</td>
</tr>
<tr>
<td>SAV 434.83</td>
<td>Precision sine circular grinder</td>
<td>With sine setting</td>
<td>24</td>
</tr>
<tr>
<td>SAV 434.85</td>
<td>Precision circular grinder</td>
<td>With manual drive</td>
<td>25</td>
</tr>
<tr>
<td>SAV 434.87</td>
<td>Precision circular grinder</td>
<td>With side-mounted drive motor</td>
<td>26</td>
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<td>Accessories circular grinding / indexing heads</td>
<td>28</td>
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</tbody>
</table>
**Application:**
This circular grinding device has been specially designed for use in the areas of toolmaking, fixture/jig manufacture and mould/die construction. Due to its compact size the device can be used at any time with the minimum of set-up effort. Through its universal applicability it is possible to machine parts which can not be produced on other circular grinding machines or only with a great deal of effort.

**Features:**
The base plate and all wear-parts are hardened. Safety class of bearing and motor: IP 54.

With Spindle mountings:
- Schaublin 470 E (Sch)
- ISO 30 taper (SK 30)
- Deckel 355 E (D)

Adjustable tailstock on base plate: with spring-loaded centre point.

Control unit SAV 875.40, included in delivery. Stagelessly adjustable 24 Volt Electro-Motor from 0 - 333 1 / min.

Right / left rotation.

With indexing device 12 x 30° via index pins, Other divisions available upon request.

Sine swivel range from 0˚ - 45˚.

**Accessories:**
Permanent circular magnet:
D = 100 mm, with flange.
SAV 244.03 - 100 - Mounting

3-Jaw chuck:
D = 80 mm, with flange.
SAV 439.62 - 80 - Mounting

4-Jaw chuck:
D = 80 mm, with flange.
SAV 439.63 - 80 - Mounting

Face plate:
D = 90 mm, with M8 thread.
SAV 439.64 - 90 - Mounting

Collet: Schaublin No. 470 E:
D = 2.0 to 3.0, Increment 0.5 mm
D = 4.0 to 20.0, Increment 1.0 mm
or complete set from 3.0 to 18.0 mm (Set)
SAV 439.67 - 470 E - Set

Centre point:
60° 60° point angle, with drive pin.
Spindle-mounted with flange.
SAV 439.71 - Mounting

Collet: Deckel Nr. 355 E:
D = 0.5 to 18.0, or complete set from 3.0 to 18.0 mm (Set)
SAV 439.66 - 355 E - Set

**Ordering example:**
Precision sine circular grinder: SAV 434.80 - SK 30
Designation: SAV - No. - Mounting

**Control unit SAV 875.40**
W x H x L = 170 x 140 x 230
With sine setting

Application:
This circular grinding device has been specially designed for use in the areas of toolmaking, fixture/jig manufacture and mould/die construction. Due to its compact size the device can be used at any time with the minimum of set-up effort. Through its universal applicability it is possible to machine parts which can not be produced on other circular grinding machines or only with a great deal of effort.

Features:
The base plate, the angle plate and all wear parts are hardened.
Safety class of bearing and motor: IP 54.

With spindle mountings:
- Schaublin 470 E (Sch)
- ISO 30 taper (SK 30)
- Deckel 355 E (D)

Control unit SAV 875.40, included in delivery.
Stagelessly adjustable 24 Volt Electro-Motor from 0 - 333 1 / min.

Right / left rotation.

With indexing device 12 x 30˚ via index pins,
Other divisions available upon request.
Sine swivel range from 0˚ - 35˚.

---

**Accessories:**
- Permanent circular magnet:
  D = 100 mm, with flange.
  SAV 244.03 - 100 - Mounting
- 3-Jaw chuck - adjustable:
  D = 80 mm, with flange.
  SAV 439.62 - 80 - Mounting
- 4-Jaw chuck:
  D = 80 mm, with flange.
  SAV 439.63 - 80 - Mounting
- Face plate:
  D = 90 mm, with M8 thread.
  SAV 439.64 - 90 - Mounting
- Collet: Schaublin No. 470 E:
  D = 2.0 to 3.0, Increment 0.5 mm
  SAV 439.67 - 470 E - Set
- Collet chuck: Type ER:
  SAV 439.65 - ER 32 - SK 30
- Collet: Deckel Nr. 355 E:
  D = 0.5 to 18.0 mm or complete set from 3.0 to 18.0 mm (Set)
  SAV 439.66 - 355 E - Set

---

**Dimensions:**
- Base area:
  in mm 160x80
- Height horizontal:
  in mm 107
- Total length:
  in mm 160
- Spindle height:
  in mm 50
- RPM:
  in 1/min 0 - 333
- Spindle concentricity:
  in mm 0.003
- Weight circular grinder:
  in kg ca. 9.0
- Weight Steuerung:
  in kg 4.8

---

**Ordering example:**
- Precision sine circular grinder: SAV 434.81 - SK 30
- Designation:
  SAV - No. - Mounting
**With sine setting**

**Application:**
Circular grinding, taper grinding, profile grinding, plunge-cut grinding.
This circular grinding device has been specially designed for use in the areas of tool-making, fixture/jig manufacture and mould/die construction.
By swivelling according to the sine principle, this device can also be brought into a horizontal position. It is then possible to use it for flat grinding.

**Features:**
The base plate and all wear-parts are hardened. Safety class of bearing and motor: IP 54, splash-proof. Swivel range up to 90 degrees. Special executions available upon request.

With Spindle mountings:
- Schaublin 470 E (Sch)
- ISO 40 taper (SK 40)
Compact construction, low space requirement, can be used immediately.
Control unit SAV 875.40, included in delivery. Stagelessly adjustable 24 Volt Electro-Motor from 0 - 200 1 / min.
Right / left rotation.
With retaining holes 4 x 90°. Upon request with raster indexation for use as an indexing head – surcharge applies.
Sine swivel range from 0˚ - 35˚.
Modular system. Special mountings and executions according to your specifications can be supplied. Suitable for concentricity testing.

<table>
<thead>
<tr>
<th>Spindle height</th>
<th>in mm</th>
<th>83</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>in mm</td>
<td>150</td>
</tr>
<tr>
<td>Width incl. Motor</td>
<td>in mm</td>
<td>200</td>
</tr>
<tr>
<td>Height incl. Motor</td>
<td>in mm</td>
<td>210</td>
</tr>
<tr>
<td>Height vertical</td>
<td>in mm</td>
<td>145</td>
</tr>
<tr>
<td>RPM</td>
<td>in 1/min</td>
<td>0 - 200</td>
</tr>
<tr>
<td>Weight</td>
<td>in kg</td>
<td>13</td>
</tr>
</tbody>
</table>

**Accessories:**
3-Jaw chuck:
D = 80 mm, with flange.
SAV 439.62 - 80 - Mounting
D = 100 mm, with flange.
SAV 439.62 - 100 - Mounting
4-Jaw chuck:
D = 80 mm, with flange.
SAV 439.63 - 80 - Mounting
D = 100 mm, with flange.
SAV 439.63 - 100 - Mounting

Permanent circular magnet:
D = 100 mm, switchable, with flange.
SAV 244.03 - 100 - Mounting

Collet: Schaublin No. 470 E:
D = 2.0 to 3.0, Increment 0.5 mm
D = 4.0 to 20.0, Increment 1.0 mm
or complete set from 3.0 to 18.0 mm (Set)
SAV 439.67 - 470 E - Set
Application:
Circular grinding, profile grinding, indexing, concentricity testing.

Features:
All wear-parts are hardened. The bearing is splash-proof. Compact construction, low space requirement, can be used immediately. Modular system. Special executions on request.

Size 100 (with spindle executions):
- Schaublin 470 E (Sch)
- ISO 30 taper (SK 30)
- Deckel 355 E (D)
With indexing device 12 x 30° via index pins, Other divisions available upon request.

Size 200 (with spindle mounts):
- Schaublin 470 E (Sch)
- ISO 40 taper (SK 40)
With retaining holes 4 x 90°. Upon request with raster indexation for use as an indexing head – surcharge applies. Upon request with index bores, Divisions according to customer specifications.

Accessories:
3-Jaw chuck:
D = 80 mm, with flange.
SAV 439.62 - 80 - SK 40
D = 100 mm, with flange.
SAV 439.62 - 100 - SK 40

4-Jaw chuck:
D = 80 mm, with flange.
SAV 439.63 - 80 - SK 40
D = 100 mm, with flange.
SAV 439.63 - 100 - SK 40

Permanent circular magnet:
D = 100 mm, switchable, with flange.
SAV 244.03 - 100 - SK 40

Collet: Schaublin No. 470 E:
D = 2.0 to 3.0, Increment 0.5 mm
D = 4.0 to 20.0, Increment 1.0 mm
or complete set from 3.0 to 18.0 mm (Set)
SAV 439.67 - 470 E - Set

Collet: Deckel Nr. 355 E:
D = 0.5 to 19.0 mm or complete Set from 3.0 to 18.0 mm (Set)
SAV 439.66 - 355 E - Set

Ordering example:
Precision circular grinder SAV 434.85 - 100 - SK 30
Designation SAV - No. - Size - Mounting
Precision Circular Grinder

SAV 434.87

With side-mounted drive motor

**Application:**
For flat grinding machines for the production of individual parts or small batches in the areas of toolmaking, fixture/jig manufacture and mould/die construction. A special device for profile, circular and plunge-cut grinding. Suitable for continuous use.

**Features:**
With Deckel 355 E spindle mounting. Backlash-free, pre-loaded, axial angular contact bearing unit. Maintenance-free, robust, DC motor. Safety class IP 65, splash-proof. Precision circular grinder with larger base plate and tailstock (SAV 434.88) also available. Regulator unit SAV 875.41 included in delivery. Made from hardened, precision-ground steel. 20 mm spindle sleeve by use of a side-mounted motor. Planetary gear with transmission ratio 1 : 3. Right / left rotation stagelessly adjustable from 70 to 430 1 / min. Wooden case SAV 539.23 Supplied at a surcharge.

**Accessories:**
- 3-Jaw chuck:
  - D = 80 mm
  - SAV 439.62 - 80 - D
- 4-Jaw chuck:
  - D = 80 mm
  - SAV 439.63 - 80 - D
- Permanent circular magnet:
  - D = 100 mm
  - SAV 244.03 - 100 - D
- Face plate:
  - D = 90 mm
  - SAV 439.64 - 90 - D
- Sine plate with clamping fixture:
  - SAV 439.72 - T 100 - S
- Collet: Deckel Nr. 355 E:
  - D = 1,0 to 18,0 mm or complete Set from D = 3,0 to 18,0 mm (Set).
  - SAV 439.66 - 355 E - 4,0

**Example workpieces**

<table>
<thead>
<tr>
<th>Length in mm</th>
<th>Width in mm</th>
<th>Height in mm</th>
<th>Overall length incl. Motor in mm</th>
<th>Spindle height in mm</th>
<th>Spindle concentricity in mm</th>
<th>RPM in 1/min</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>180</td>
<td>112</td>
<td>350</td>
<td>67</td>
<td>0,002</td>
<td>70 - 430</td>
<td>8.9</td>
</tr>
</tbody>
</table>

**Ordering example:**
- Precision sine circular grinder: SAV 434.87
- Designation: SAV - No.
Sonder-Zubehör

3-Jaw chuck

Execution - Adjustable (E)
Execution - Fixed (F)
Diameter $A = 80 \text{ mm}$ or $A = 100 \text{ mm}$
Available flange types: Schaublin (Sch), Deckel (D), ISO 30 (SK 30), ISO 40 (SK 40) and MT 4 (MK).

Ordering example:
3-Jaw chuck SAV 439.62 - 100 - E - D
Designation SAV - No. - A - Execution - Flange

4-Jaw chuck

Diameter $A = 80 \text{ mm}$ or $A = 100 \text{ mm}$
Available flange types: Schaublin (Sch), Deckel (D), ISO 30 (SK 30), ISO 40 (SK 40) and MT 4 (MK).

Ordering example:
4-Jaw chuck SAV 439.63 - 100 - SK 30
Designation SAV - No. - A - Flange

Face plate

Diameter $A = 90 \text{ mm}$.
With flange and M8 thread.
Available flange types: Schaublin (Sch), Deckel (D), ISO 30 (SK 30).

Ordering example:
Face plate SAV 439.64 - 90 - SK 30
Designation SAV - No. - A - Flange

Collet - Deckel No. 355 E

S 20 x 2
Clamping range from $D = 0.5 \text{ mm}$ to $18.0 \text{ mm}$,
Increment 0.5 mm ascending. Also available in sets (Set) consisting of 31 collets from 3 mm to 18 mm diameter.

Ordering example:
Collet SAV 439.66 - 355 E - 4,0
Designation SAV - No. - Typ - D or Set

Nuts for Collet 470 E

For all devices with Schaublin (Sch) spindle taper mounting M40 x 1.5

Ordering example:
Collet nut SAV 439.68 - 1
Designation SAV - No.
ACCESSORIES CIRCULAR GRINDING / INDEXING HEADS

Special accessories

Centre Point

Fixed, mounted on the tailstock for circular grinding devices
SAV 434.80 / 434.82 / 434.84

Ordering example:
Centre Point SAV 439.69
Designation SAV - No.

Centre Point

Spring-loaded, mounted on the tailstock for circular grinding devices
SAV 434.80 / 434.82 / 434.84

Ordering example:
Centre Point SAV 439.70
Designation SAV - No.

Centre Point

60° point angle, with drive pin. Spindle-mounted with flange.
Flange types available: Schaublin (Sch), Deckel (D), ISO 30 (SK 30), ISO 40 (SK 40).

Ordering example:
Centre Point SAV 439.71 - Sch
Designation SAV - No. - Flange

Sine plate

With clamping fixture for circular grinding devices
SAV 434.86 / 434.87 / 434.88

Ordering example:
Sine plate SAV 439.72 - T 100 - S
Designation SAV - No. - Type

3-Jaw, quick-action chuck

Diameter A = 80 mm or A = 110 mm.
Flange types available: Schaublin (Sch), Deckel (D), ISO 30 (SK 30), ISO 40 (SK 40) and MT 4 (MK).
Execution with 6-jaws available upon request.

Ordering example:
3-Jaw, quick-action chuck SAV 439.73 - 110 - SK 30
Designation SAV - No. - A - Flange
## PRODUCT OVERVIEW

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<th>COMMENTS</th>
<th>PAGE</th>
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<td>Vertical and horizontal</td>
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<td>SAV 483.20</td>
<td>Precision roller blocks</td>
<td>For static balancing</td>
<td>31</td>
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</table>
ZERO SETTER – THE ORIGINAL

SAV 483.02

Vertical and horizontal

Application:
For setting of tools (e.g. milling tools) to “zero” and to determine the reference point of the machine spindle. No damage to tools; feeler gauges and edge finders are not required.

Features:
Housing and spring-loaded measuring surface made from hardened tool steel; precision ground. Supplied complete with dial gauge (reading accuracy 0.01 mm) in a rubber storage case. A version with a stop for horizontal application of the milling tool is available under Order No.: SAV 483.02 - NE 2

Usage:
1. Bring the spring-loaded measuring surface and the reference surface of the device to the same height using a straight edge and set the dial gauge pointer to -0.50.
2. Place the zero setter NE1 with the base surface on the workpiece to be machined. When setting the reference point for the horizontal spindle with the device NE 2, put the lateral side on the workpiece, making sure the side stop is positioned securely against the workpiece edge.
3. Move the resting tool on to the spring-loaded measuring surface until the dial gauge pointer is at “0”. The milling cutter is now positioned exactly 50 mm ±0.01 mm above the workpiece to be machined (NE 1), or it is up to ±0.01 mm above the workpiece edge (NE 2). The reference point can now be entered into the machine control unit.

Reading accuracy of the gauge in mm 0.01
Height: housing – reference surface in mm 49.5
Height: spring-loaded measuring surface in mm 51.5
Housing diameter in mm 68
Diameter measuring surface in mm 45

Ordering example:
Zero Setter SAV 483.02 - NE 1
Designation SAV - No. - Type
For static balancing

**Application:**
For the static balancing of grinding discs, flywheels, fan blades, ship propellers’ etc. The balancing precision is dependent on the quality of the rotor axis or the balancing arbour, so that a residual eccentricity of 0.01 mm can clearly be observed.

As there is no restriction on the spacing distance between the roller blocks and that they can be positioned on support bases, the only limitation on the diameter and length is dependent on the weight of the test piece. The high level of true-running precision also makes them suitable for concentricity testing.

**Features:**
The hardened and ground roller discs are seated in precision ball bearings.
The narrow, overlapping roller discs also enables the acceptance of test specimens with small bearing surfaces. Mounting the roller blocks on bed rails makes for easy setting of defined bearing spacings.
The use of bed rails is especially beneficial for concentricity testing.

1 Set = 2 Pieces

Roller blocks for greater weights up to 50,000 kg available upon request.

<table>
<thead>
<tr>
<th>Loading capacity in kg</th>
<th>Dimensions in mm</th>
<th>Weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1 - 10</td>
<td>A 200 B 120 C 170 D 20 E 215 F 219 G 6 H 45 I 63</td>
<td>8,0</td>
</tr>
<tr>
<td>5 - 100</td>
<td>A 200 B 160 C 250 D 40 E 335 F 330 G 9 H 70 I 100</td>
<td>20,0</td>
</tr>
<tr>
<td>20 - 400</td>
<td>A 360 B 230 C 380 D 80 E 500 F 480 G 12 H 80 I 130</td>
<td>56,0</td>
</tr>
</tbody>
</table>

**Ordering example:**
*Precision roller block set* SAV 483.20 - 400
*Designation* SAV - No. - Loading capacity
1. General and contract conclusion
a) all agreements and offers are based on our conditions; they apply as accepted through placement with full acceptance of the supply. Delays or changes in the conditions of the customer, which we do not accept expressly in writing, are noncommittal for us, even if we do not contradict explicitly.

b) Prior to acceptance of our offer our confirmation of order is determining. Verbal, telephonically, telegraphic and telefaxed special agreements and additional contract modifications have validity only in written confirmation by us. The same applies to assumed properties of the supplied article. All data in our designs, illustrations, measurement tables, weight tables etc. are - so far not explicitly confirmed by us - only approximate values. The documents belonging to the offers remain our property, are subordinate to our copyright and may not be made accessible to third parties or only with our written approval.

c) The order acceptance by us takes place in writing. If we should deviate slightly in our order confirmation in relation to the order of the customer, then our order confirmation is obligatory, if within eight days - in urgent cases by telephone call, telegram or telefax - one does not object in writing to these. Hereunder applies the principle that a wrong transmission always goes debited to the customer, and will not be borne by us.

d) Place of delivery for all obligations developing from the contractual relation is Nuremberg. Jurisdiction for all the disputes rising out of our business relations is Nuremberg; after our choice also seat of the customer (with foreign contracts: also court of the capital of the country, in which the customer has his seat). The contractual relation is subject to German law, right under exclusion of international purchase rights.

2. Prices
The prices are in Euro. The prices apply, if not explicitly differently agreed, purely net ex works including loading, excluding packing, freight, insurance, assembly and other additional expenses. All increases of freight and tariffs, value added tax, material prices and wages are for the account of the customer. With supplementary orders the prices are newly agreed upon.

3. Delivery time.
The delivery time is specified after best discretion and is therefore to be understood as approximately, excluding explicitly firm designated agreements. The time for delivery starts only from the time, in which written agreement exists over the final supply and all dispatch necessary for the trouble-free execution of the order are clarified. The time for delivery does not begin before the time that all documents are made available to us, the necessary official approval, explanations, permissions and releases etc. are available and the customer has fulfilled the agreed payments and other obligations.

The delivery time is considered as firm, if the shipment has left our works within the agreed delivery time. If the delivery is delayed for reasons not attributable to us, then the time for delivery is considered as firm with the message that goods are ready for dispatch within the agreed delivery time.

The time for delivery extends - also within a delivery delay appropriate at occurrence of unforeseen events, which we could reasonably not prevent despite the circumstances of the case – equally to events in our work or at possible subcontractors - for example operational disturbances, wasting of an important working part, delays in the delivery of substantial raw materials and delivery parts, strike, lockout, mobilization, war and riot as well as law cases rising over its developing and it's effectiveness is Nuremberg; after our choice also seat of the customer (with foreign contracts: also court of the capital of the country, in which the customer has his seat). The contractual relation is subject to German law, right under exclusion of international purchase rights.

At later changes of the contract, which can affect the delivery time, the delivery time extends, unless special agreements concerning this can be made, to appropriate extent. Consequential loss or damage because of late supply with negligent behaviour by us or our personnel are exclusively excluded.

In any case we are responsible for such damage only up to the invoice amount excluding V.A.T., whose cause and extent could have been foreseen by us. Partial deliveries are permissible. For special and customer specific products a withdrawal is not possible.

4. Terms of payment
Our invoices are payable within eight days from invoice date with 2.5% discount or within 30 days net. Repair and spare part invoices are immediately payable without any deduction. The retention of payment due to whatever unrecognized or legally invalid counterclaims of the customer just as inadmissible as the set-off with such counterclaims.

Cheques and discountable changes are accepted only after special agreement and only when all additional collection and discount charges are paid. When payment is received after the due date, interest according the usual bank interest on debt balances plus 2% as well as all arising additional fees or other costs can be charged.

With call-off orders we are entitled make our invoices payable at readiness for dispatch. With call-off orders, starting 14 days after announcement of readiness for dispatch, the additional charges for storage, care and shifting of the commodities can be charged.

With additional charges which were accepted by us the entire remainder becomes immediately due, if the customer with a due payment is over 10 days in delay or in his financial circumstances nature due, if the customer with a due payment is over 10 days in delay or substantial degradations in his financial circumstances occurs.

In addition we are entitled to reject all pending supplies subject to payment, or to insist on acceptance and/or if necessary validate claims for damages in accordance with the condition of the previous paragraph.

5. Transfer of risk
The risk is passed-on to the customer, even if freight-free delivery was agreed:

a) At delivery of the supplies by us or of one of our assigned transporters, however latest at leaving our warehouse. This packing takes place after best discretion of the supplier. On request and for the account of the customer the delivery is insured by the supplier against breakage, transportation- and fire damage.

b) If the dispatch, the delivery or the acceptance are delayed for reasons, which are not attributable to us, then the risk is transferred to the customer on the day of readiness for dispatch; however we are prepared to take out a desired insurance on request and for the account of the customer.

6. Receipt
Delivered articles are to be received by the customer, even if they show insignificant defects. Partial deliveries are permissible.

7. Guarantee
If a commodity is defective, is missing assured characteristics or will lose characteristics during the guarantee period due to production or material failures or will it become defective during the guarantee period due to production or material failures, then we, without exclusion of further guarantee claims of the customer, according our choice supply a replacement or have the commodity reordered.

If this is not possible, the rework fails or is refused by us or unreasonably delayed, then the customer has the right to a replacement or reduction. Damage claims because of non-fulfillment or consequential damage are explicitly not accepted, except for mandatory liability because of guilt.

For consequential damages we only take responsibility, if the customer should be secured by the warranty against such consequential damages. In these cases we are liable only up to the expected interest, maximum up to 2-times the value of the supply, excluding value added tax.

Determination of all defects must be announced immediately - with recognized defects at latest within 8 days after receipt of the commodities, with non-recognized defects immediately after determination - in writing.

Costs of the workaround are for our account up to the value of the defective part, beyond that is for the account of the customer.

Wear or damages, which are due to careless or unsuitable use, excessive load, unsuitable equipment, inadequate construction work, is excluded, as far as known to us at completion of contract and the use was expressly assured.

When improper changes or repairs are made by the customer or a third party, our liability for the consequences caused by this is waived.

For improvement work and spare pieces we are liable to the same amount as for the original delivered commodity, and only up to the expiration of the guarantee period of the original delivered commodity.

For sub supplied commodities our total liability is limited to passing on the liability claims, which we have against the supplier of these commodities.

Only if they were claimed without result, our liability according paragraph 1 is revived again. In all cases only such damages, whose cause and extent were foreseeable for us, are replaced.

The guarantee claims expire 12 months after delivery.

8. Other claims for damages, resignation
Claims for damages from impossibility of the performance, delay, positive violation of contract, debts at completion contract or tortuous liability are excluded, unless, these are based on intent or gross negligence of us. Claims for damages are limited in each case to the value of the supply.

When the performance becomes impossible to us or the customer, then general rights of law apply under the following condition:

If impossibility is due to our fault, then the customer is entitled to require compensation of damages. This is limited to half of the value of the supply, excluding value added tax, of the part of the supply or performance, which cannot be taken in useful service because of the impossibility.

The right of the customer to the resignation remains unaffected. If unexpected events in the sense of number 3 of the economic meaning or the contents of the supply or performance change substantially or considerably affect on our company, the contract will be changed proportionally.

As far as this is economically not justifiable, a right of resignation is entitled to us. If we want to make use from this right, then we will communicate this to the customer immediately after determination of significance, and also then, when even at first with this an extension of the delivery time was agreed upon.

In all cases only such damages, whose origin and extent were foreseeable for us, are replaced.

9. Right of ownership
The supplied commodity remains our full property until full payment, also the future developing demands, indifferently from whatever argument this developed, even if payments for particularly designated demands were made. With open invoices the reserved property applies as security of our demand for balance.

a) By machining and processing of the reserved commodities, the customer does not acquire the property of the new item in accordance with § 958 BGB. The processing is performed by the customer for us, without resulting in any obligations to us. If the reserved commodities are processed, connected, mixed or integrated with other items not belonging to us, we acquire the property of the new item in relationship to the value of the reserved commodity to the other finished items.

b) The allowances of the customer from resale or rental of the reserved commodities are directly assigned to us and without consideration, if the reserved commodities are without or after processing, connection, mixture or integration and if they are resold to one or multiple customers.

These demands serve as protection only up to the value of the already sold reserved commodities. In case that the reserved commodities are sold together with other items not belonging to us, with or without processing, the transfer of the demand for purchase price applies only to the amount of the reserved commodities , which is, together with other items, the subject of this contract.

Regardless of the transfer and our right to resignation, the customer is entitled for resignation in so far, when he fulfills his obligations to us and does not come into financial collapse. On request the customer has to give us the details necessary for the resignation of the resigned demands, and communicate the resignation to the debtors.

The customer has to inform us immediately about the execution measures of third parties in the reserved commodities in accordance with best care. The customer has to inform us immediately about the execution measures of third parties in the reserved commodities, by handing over the documents necessary for an intervention. The customer bears the cost of our intervention.

c) The customer has the obligation to keep the commodities in proper condition during the duration of the right of ownership and will directly have the necessary repairs - apart from emergencies - performed by us or by one of our recognized repair workshop at own expense.

10. Transfer of the contract
The transfer of demands on us to third parties is impossible, if we do not agree in writing.
CATALOGUE I: SAV–MAGNETIC WORKHOLDING
Temporary, electro and ep-magnetic, mechanical, hydraulic, vacuum, multi-technique. Demagnetisers, sine tables, magnetic tools

CATALOGUE II: SAV–STATIONARY WORKHOLDING
Vices and clamping equipment, vacuum clamping, Angle plates and tombstone fixtures, stationary chucks and attachments

CATALOGUE III: SAV–ROTARY WORKHOLDING
Manually and power operated chucks, lever compensating, finger, console and column chucks

CATALOGUE IV: SAV–PRODUCTION AUTOMATION
Pallet changers, transfer lines, deburring cells, tool changers, loading/unloading robots

CATALOGUE V: SAV–STANDARD PARTS
Semi-finished parts, spanners, positioning elements, actuating, guiding and driving components

CATALOGUE VI: SAV–MAGNETIC LIFTING
Heavy duty magnetic lifting equipment, Permanent lifting magnets, battery lifting magnets, handling tools

CATALOGUE VII: SAV–CUSTOM SOLUTIONS
Customized magnetic, mechanical, hydraulic, vacuum, stationary and rotary workholding

CATALOGUE VIII: SAV–SMALL MAGNETS
Flat and holding magnets, pot magnets, magnet cores and office magnets

CATALOGUE IX: SAV–DRESSING AND CIRCULAR GRINDING
Dressing, circular grinding, indexing tables
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