


**CIRCULAR GRINDING AND  
DRESSING INDEXING DEVICES**  
AUXILIARY DEVICES FOR MACHINE TOOLS

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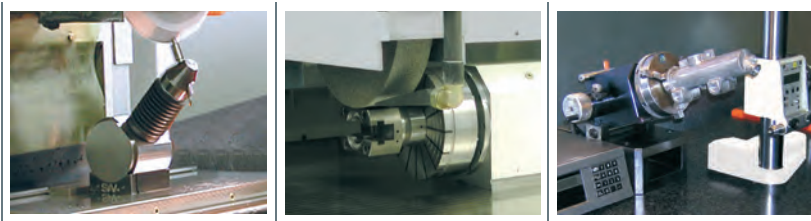
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CATALOGUE IX

# CIRCULAR GRINDING AND DRESSING INDEXING DEVICES

AUXILIARY DEVICES FOR MACHINE TOOLS





## THE COMPANY

# 30 YEARS OF PRODUCTION



## 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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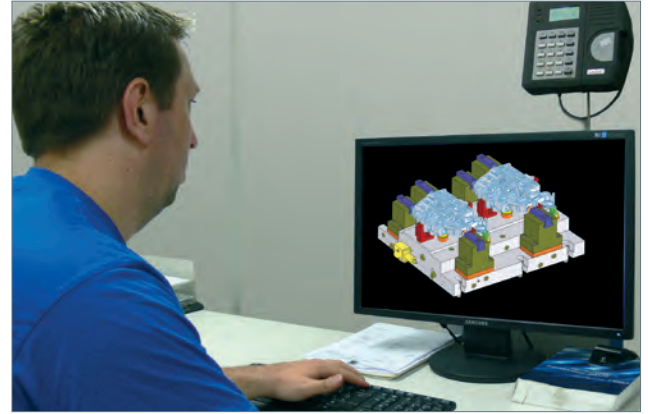
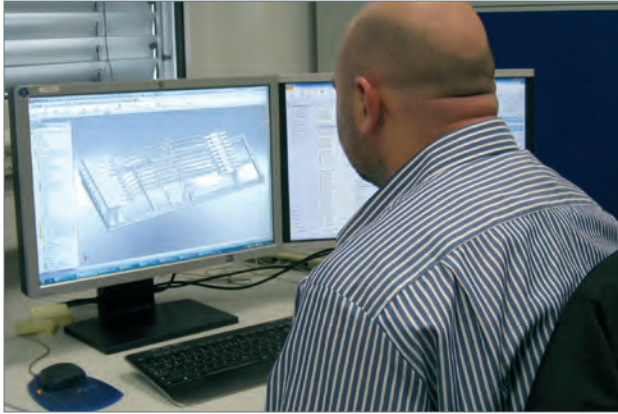


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## ENGINEERING, R&D



### 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.

#### Development competences in:

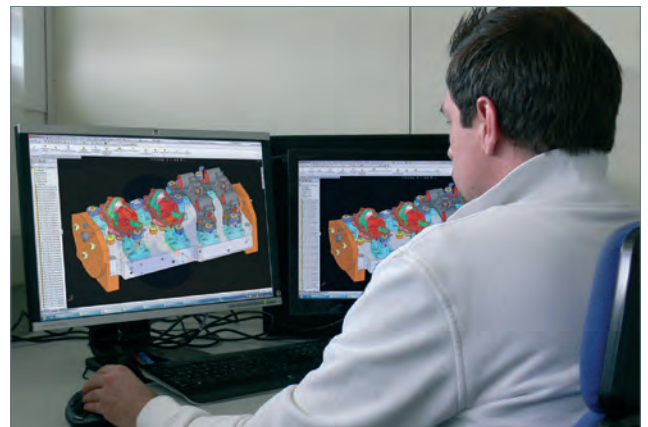
- Magnetics
- Hydraulics
- Mechanics
- Vacuum technologies
- Automation technologies
- Control technologies
- Stationary and rotating workholding technologies



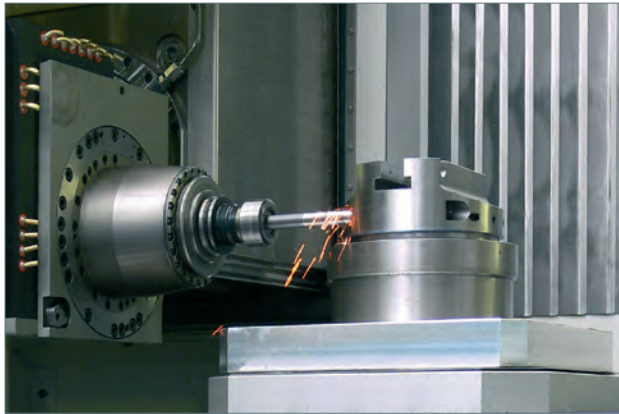
### The engineering of standard and special solutions

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.



## PRODUCTION



### 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.

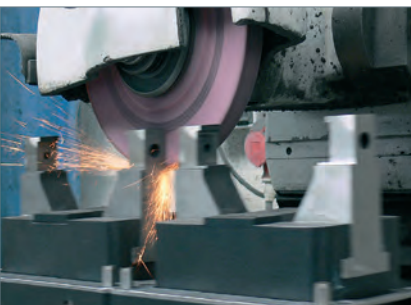
5-Axis milling, circular and surface grinding, wire cutting and sinking operations are carried out in our own production facilities.

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



## SAV – CATALOGUES



Catalogue I  
SAV – MAGNETIC WORKHOLDING



Catalogue II  
SAV – STATIONARY WORKHOLDING



Catalogue III  
SAV – ROTARY WORKHOLDING



Catalogue IV  
SAV – AUTOMATIONSLÖSUNGEN  
(only in german)



Catalogue V  
SAV – NORMTEILE (only in german)



Catalogue VI  
SAV – MAGNETIC LIFTING



Catalogue VII  
SAV – SPECIAL SOLUTIONS








Catalogue VIII  
SAV – SMALL MAGNETS



## PRODUCT OVERVIEW

1

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

## PRECISION RADIUS DRESSING DEVICE

SAV 434.01

For profiling grinding wheels

### Application:

With this radius dressing device, grinding wheels of up to  $\varnothing 400$  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 adjuster.

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.

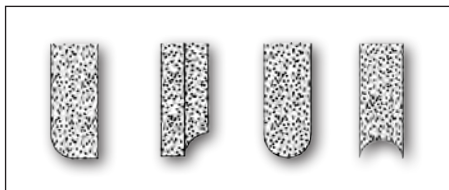
### Accessories:

Dressing diamond SAV 401.01 K 10, Type D

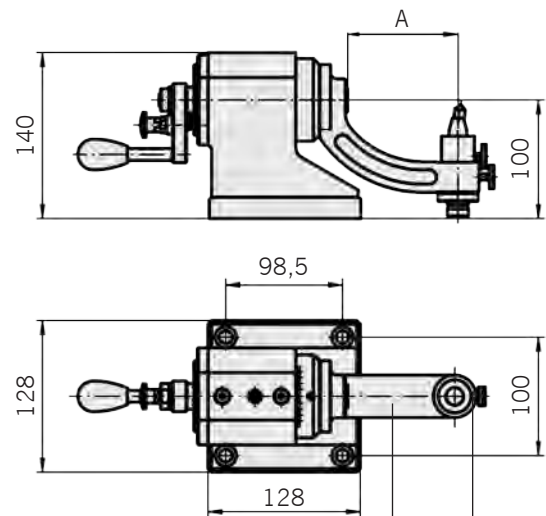
Arm 1 - SAV 434.01 - 1

Arm 3 - SAV 434.01 - 3

Both supplied at a surcharge.



Examples of profiled grinding wheels.



Dressing arm 1, 2 or 3

Dressing insert (set 3 pieces)  
included in the delivery

Arm	1	2*	3
Machining radius concave mm	19 - 112	0 - 22 / 108 - 155	151 - 199
Machining radius convex mm	-	0 - 25	21 - 68
Arm length A mm	143	143	158

\* included in the delivery

### Ordering example:

Precision Radius Dressing Device SAV 434.01  
Designation SAV - No.



## PRECISION RADIUS DRESSING DEVICE

SAV 434.02

1

For profiling grinding wheels

### Application:

With this radius dressing device grinding wheels, with concave and convex radii together with adjoining angled faces, can be profiled.

### Features:

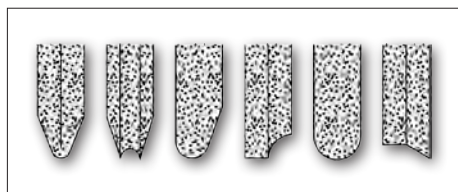
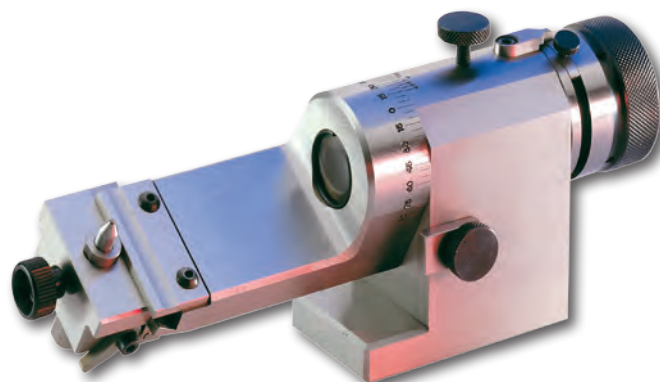
Fully precision-ground construction with end stops and a magnifying glass in the spindle. The rotating arm is equipped with a graduated scale. The radius movement is limited by adjustable end stops. The slide plate with the dressing diamond is attached to the rotating arm using a dovetail construction.

The dressing diamond is positioned using end-gauges.

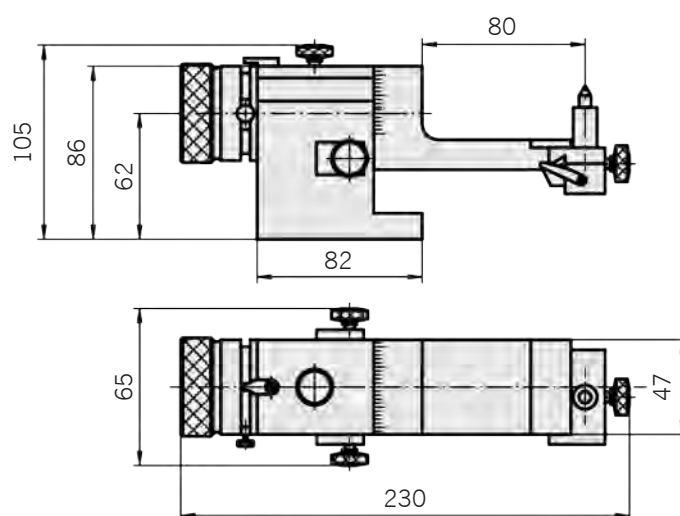
With the help of a fine adjusting screw on the diamond holder, the diamonds can be brought into the correct position with high precision.

### Accessories:

Dressing diamond SAV 401.01 - 06, Type D supplied at a surcharge.



Examples of profiled grinding wheels



Axis height	in mm	62
Max. machining radius		
- concave:	in mm	26
- convex:	in mm	16
max. grinding wheels - $\varnothing$	in mm	200
Bore hole for diamond	in mm	6
Adjustment range	in mm	$\pm 15$
Weight	in kg	4,1

### Ordering example:

Precision Radius Dressing Device SAV 434.02  
Designation SAV - No.

## PRECISION ANGLE DRESSING DEVICE

SAV 434.03

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.

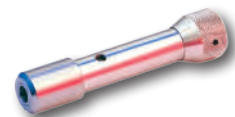
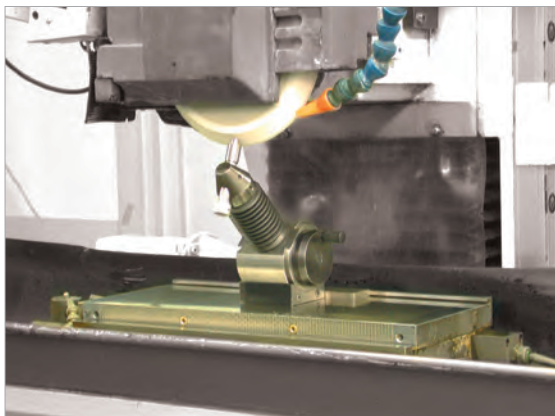
### Features:

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.

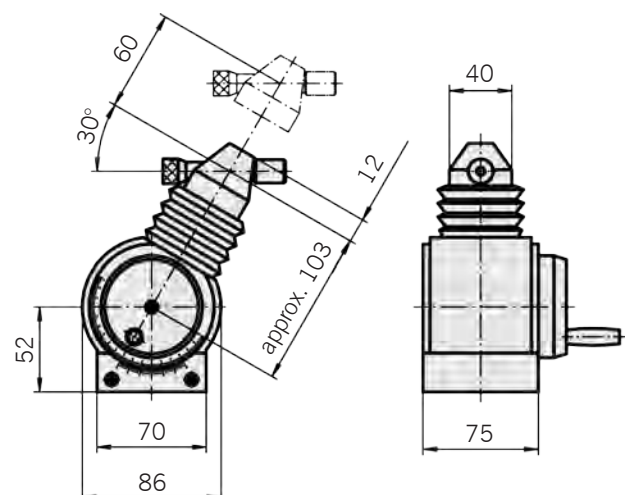
### Accessories:

Dressing diamond SAV 401.01 - 06  
Supplied at a surcharge.



Adjustable application head for diamond  
SAV 439.60 (included in the delivery)

Base area approx.	in mm	70 x 75
max. stroke	in mm	60
Bore hole for diamond	in mm	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

1

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

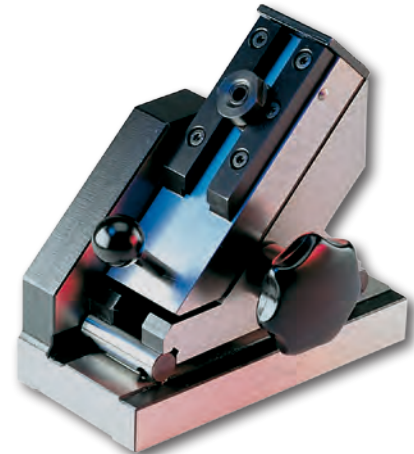
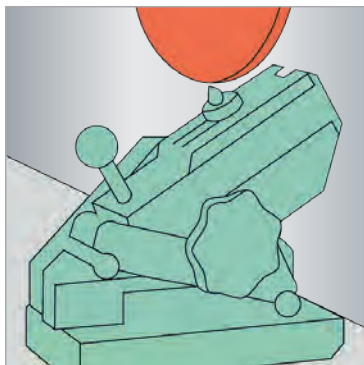
Dressing diamond for SAV 434.05 - 100:

SAV 401.01 - MK 1

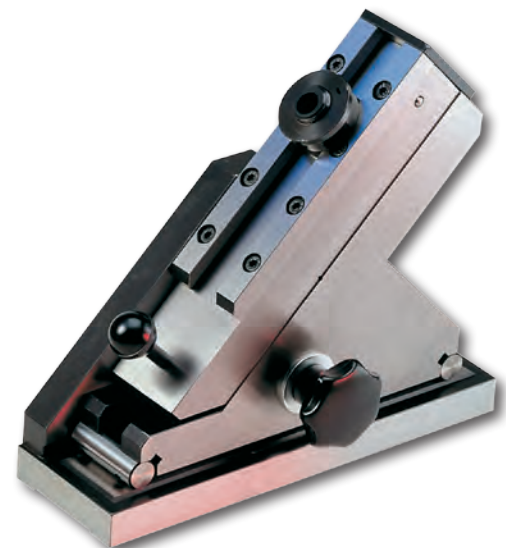
Supplied at a surcharge.

### Application:

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

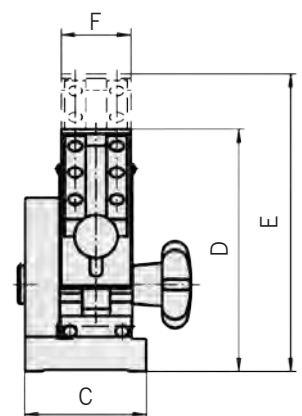
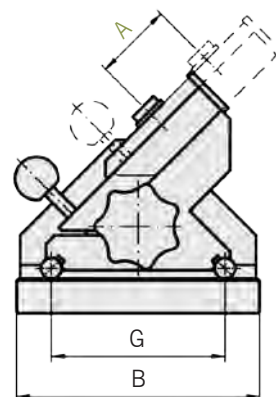


SAV 434.05 - 45  
Dressing range: 45 mm



SAV 434.05 - 100  
Dressing range: 100 mm

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



### Ordering example:

Precision Angle Dressing Device SAV 434.05 - 100

Designation SAV - No. - max. dressing range

## PRECISION SIDE-FACE DRESSER

SAV 434.06

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:

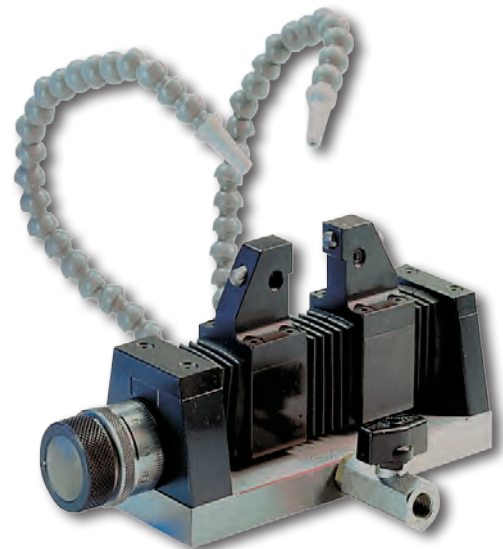
Made from hardened tool steel HRC 60.  
Available with (K) or without (N) cooling system upon request.

### Accessories:

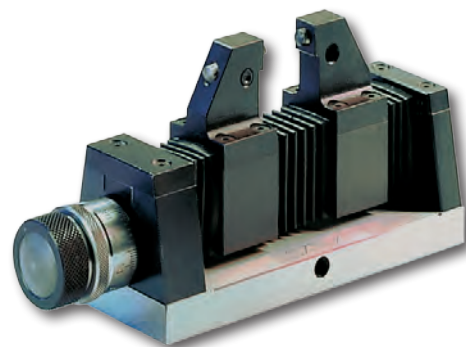
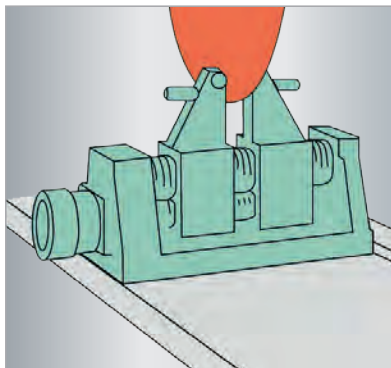
Dressing diamond

SAV 401.01 - 08, Type D

Supplied at a surcharge.

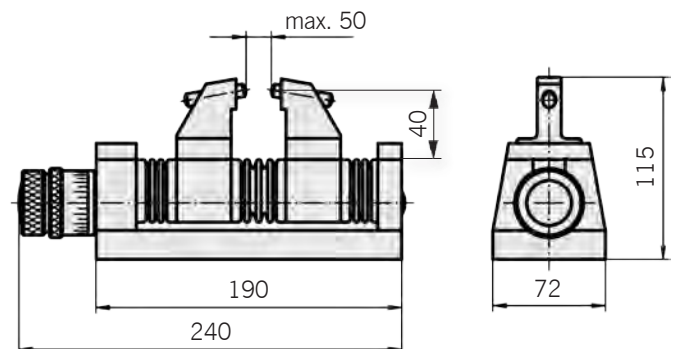


Precision side-face dresser SAV 434.06 - K,  
Type PWA 28 - K, with cooling system



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

Base plate	in mm	190 x 72
Height	in mm	115
Setting range	in mm	0,5 - 50
max. wheel thickness	in mm	50
Feed per revolution	in mm	1
Feed per scale division	in mm	0,01
Bore hole for diamond	in mm	8
Weight	in kg	5,0



### Ordering example:

Precision side-face dresser SAV 434.06 - K  
Designation SAV - No. - Execution



## PRECISION PUNCH FORMER

SAV 434.07

1

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  $\pm 30$  sec.

Equipped with handle for easy turning of index disc. Through hole 30 mm for long punches.

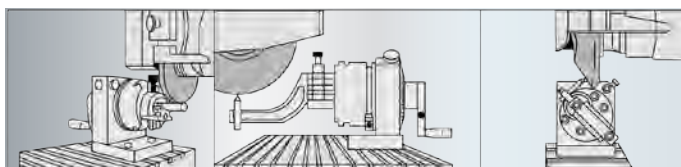
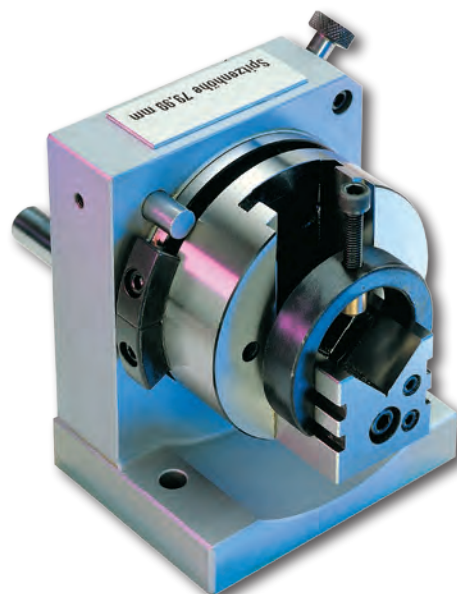
The L-shaped execution of the base provides the device with additional stability and stiffness.

### Accessories:

Angular dressing bracket: SAV 434.07 - 01

Dressing diamond: SAV 401.01 - 10 - 92

Both supplied at a surcharge.



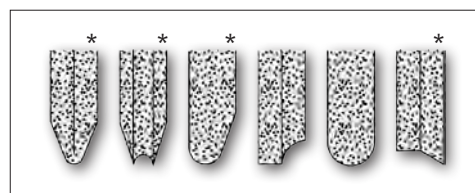
Examples of finished punches.



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

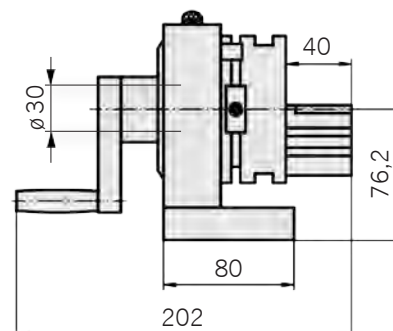
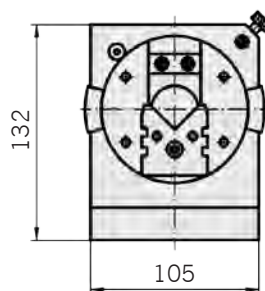


Angular dressing bracket  
SAV 434.07 - 01



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

Width	in mm	105
Overall height	in mm	132
Height to centre	in mm	76,2
Depth	in mm	202
Length of V-block	in mm	40
Clamping range V-block $\varnothing$	in mm	4 - 25
Max. machining radius:		
- concave	in mm	100
- convex	in mm	50
max. machining length	in mm	10
Aperture for diamond	in mm	10
Weight	in kg	5



### Ordering example:

Precision punch former SAV 434.07

Designation SAV - No.

## DRESSING DIAMONDS

SAV 401.01

to dress grinding discs

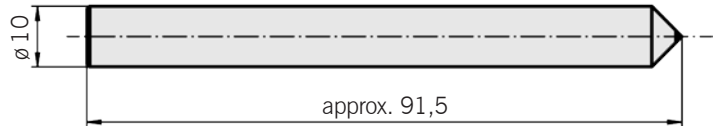
### Application:

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.

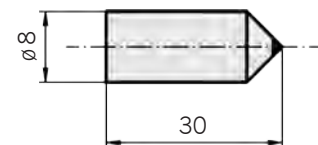
Diameter: 10 mm  
Quality: 0,5 Carat



#### Dressing diamond SAV 401.01 - 08:

Suitable for the side-face dresser SAV 434.06.

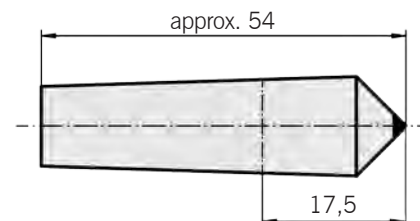
Diameter: 8 mm  
Quality: 0,25 Carat



#### Dressing diamond SAV 401.01 - MK1:

Suitable for the precision, angle dresser SAV 434.05 - 100.

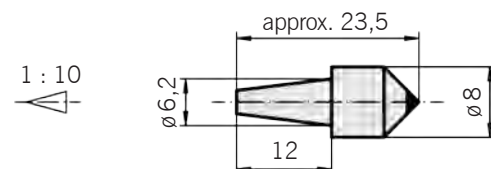
Diameter: 12,065 mm  
Morse taper: MK 1  
Quality: 0,5 Carat



#### Dressing diamond SAV 401.01 - K10:

Suitable for the grinding disc dressing device SAV 434.05 - 45 and SAV 434.01.

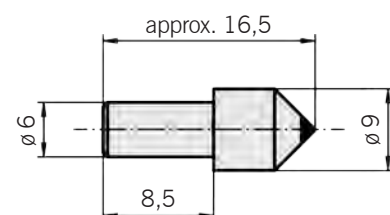
Diameter: 6,2 mm  
Taper ratio: 1 : 10  
Quality: 0,5 Carat



#### 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

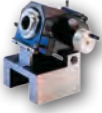

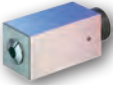


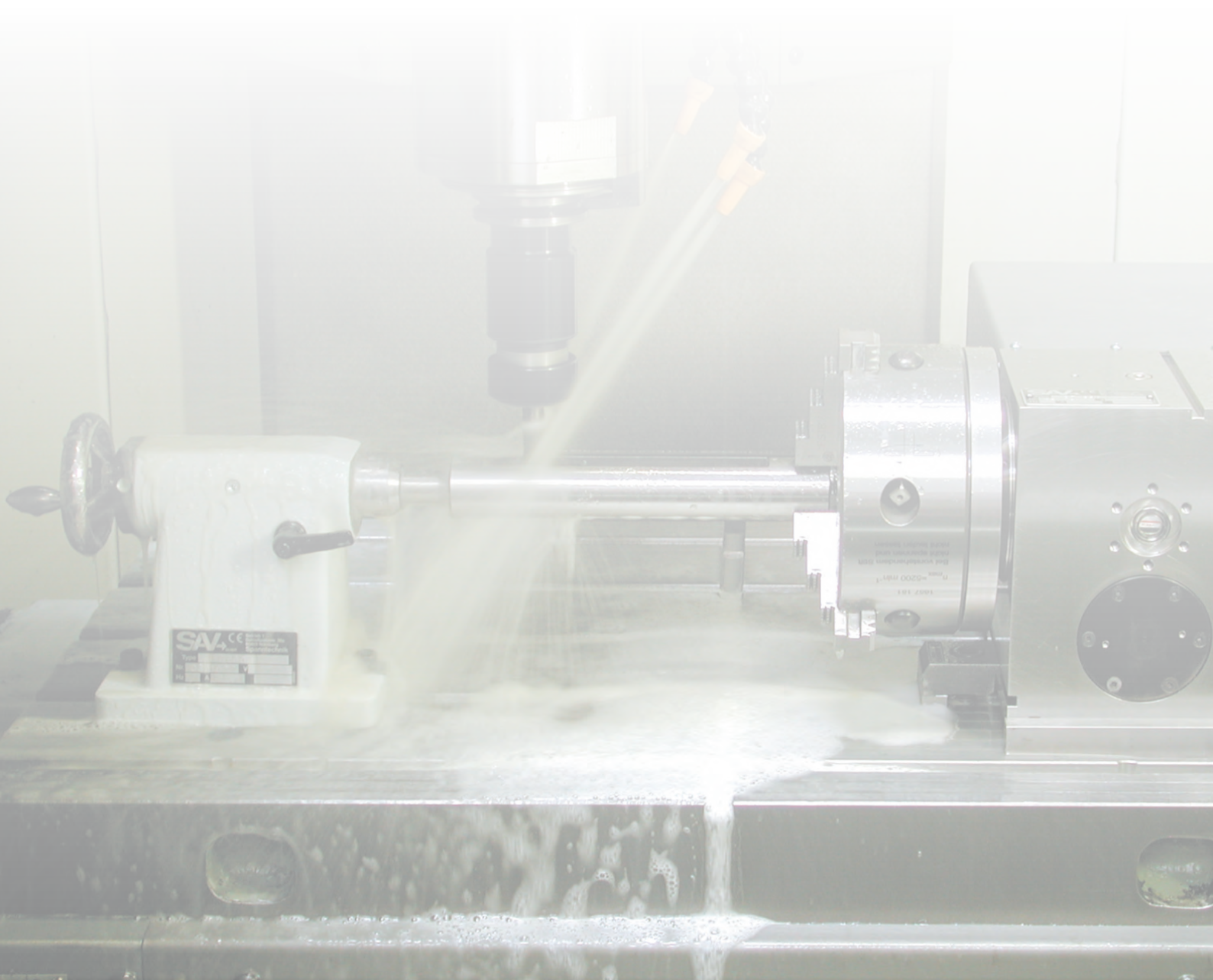
### Ordering example:

Dressing diamond SAV 401.01 - 06  
Designation SAV - No. - Type



## PRODUCT OVERVIEW

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
<b>INDEXING HEADS</b>				
	SAV 434.47	Digital, precision indexing head	with sine setting with encoder and display unit	18
	SAV 434.49	Vice indexing head	for collets according to DIN 6388 and Type ER	19
	SAV 207.11	Precision clamping blocks	to clamp round parts	20



## 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:

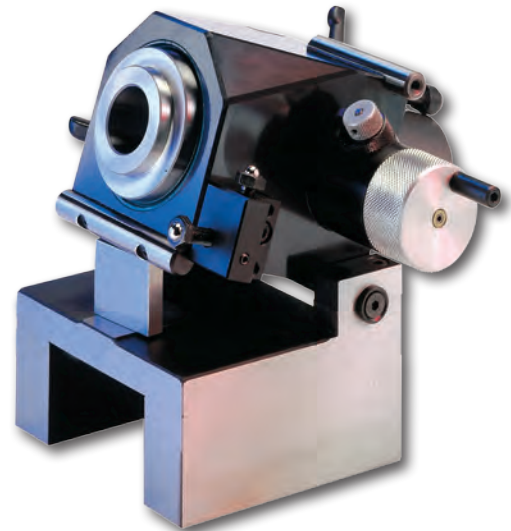
The base plate, the angle plate and wear-parts are hardened. The bearing is splash-proof.

- 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.

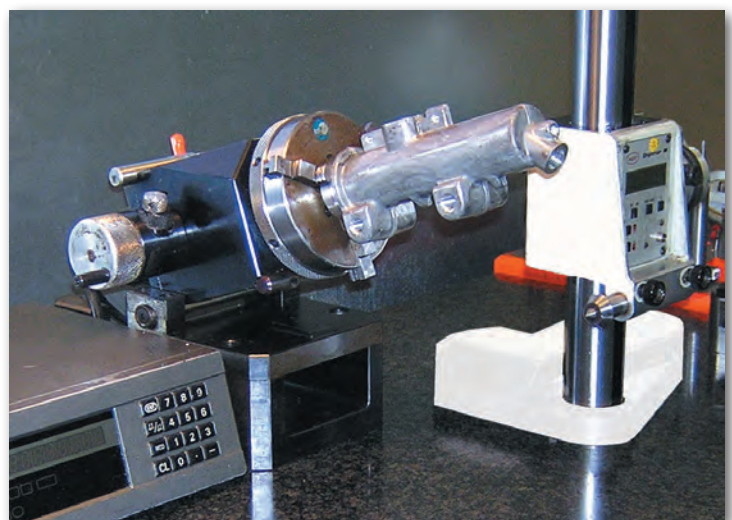
### Accessories:

- Round magnets  $\varnothing$  100
- 3- and 4-jaw chucks  $\varnothing$  80 and  $\varnothing$  100
- Mandrels
- Special mounting fixtures



Digital display unit SAV 877.41,  
(Heidenhain 281)

Length	in mm	ca. 180
Width	in mm	ca. 140
Height horizontal	in mm	ca. 180
Height vertical	in mm	ca. 190
Spindle height	in mm	ca. 122
Base plate	in mm	140 x 130
Weight	in kg	ca. 15
Angle setting range	in °	0 - 90
Subdivision	in °	0 - 360
Spindle concentricity	in mm	0,003
Resolution	in °	0,01
Spindle Mounting	in °	MK 4



### Ordering example:

Digital, precision indexing head SAV 434.47  
Designation SAV - No.



## VICE INDEXING HEAD

SAV 434.49

For collets according to DIN 6388 and Type ER

### 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  $\leq 0.1^\circ$

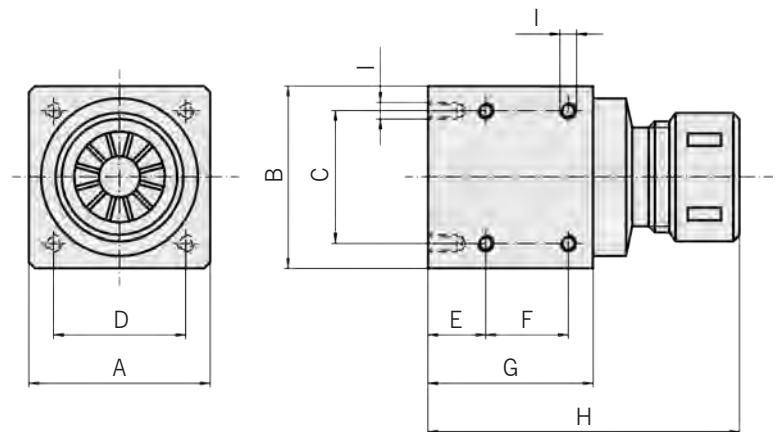
Concentricity: 0.01 mm

### 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		Dimensions in mm									Weight in kg
		A	B	C	D	E	F	G	H	I	
HF	∅ 2 - 16 DIN 6388	80	80	60	60	30	35	75	130	M 8	5,0
HF	∅ 2 - 25 DIN 6388	80	80	60	60	30	35	75	130	M 8	5,0
ER 25	∅ 1 - 16 430 E	80	80	60	60	30	35	75	130	M 8	5,0
ER 32	∅ 2 - 20 470 E	80	80	60	60	30	35	75	130	M 8	5,0
ER 40	∅ 2 - 26 472 E	80	80	60	60	30	35	75	130	M 8	5,0
HF	∅ 10 - 32 DIN 6388	100	100	80	80	35	40	90	150	M 10	9,0
ER 50	∅ 10 - 34 477 E	100	100	80	80	35	40	90	150	M 10	9,0

### 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

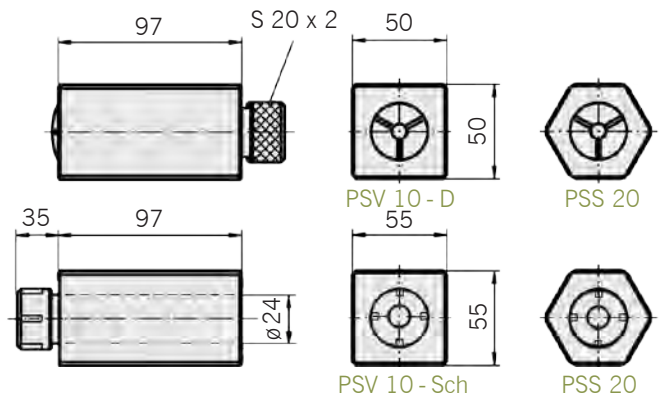
Weight PSV 20 / D / Sch: 1,4 kg / 1,85 kg

Precision clamping block

Designation

SAV 207.11 - PSV 10 - D

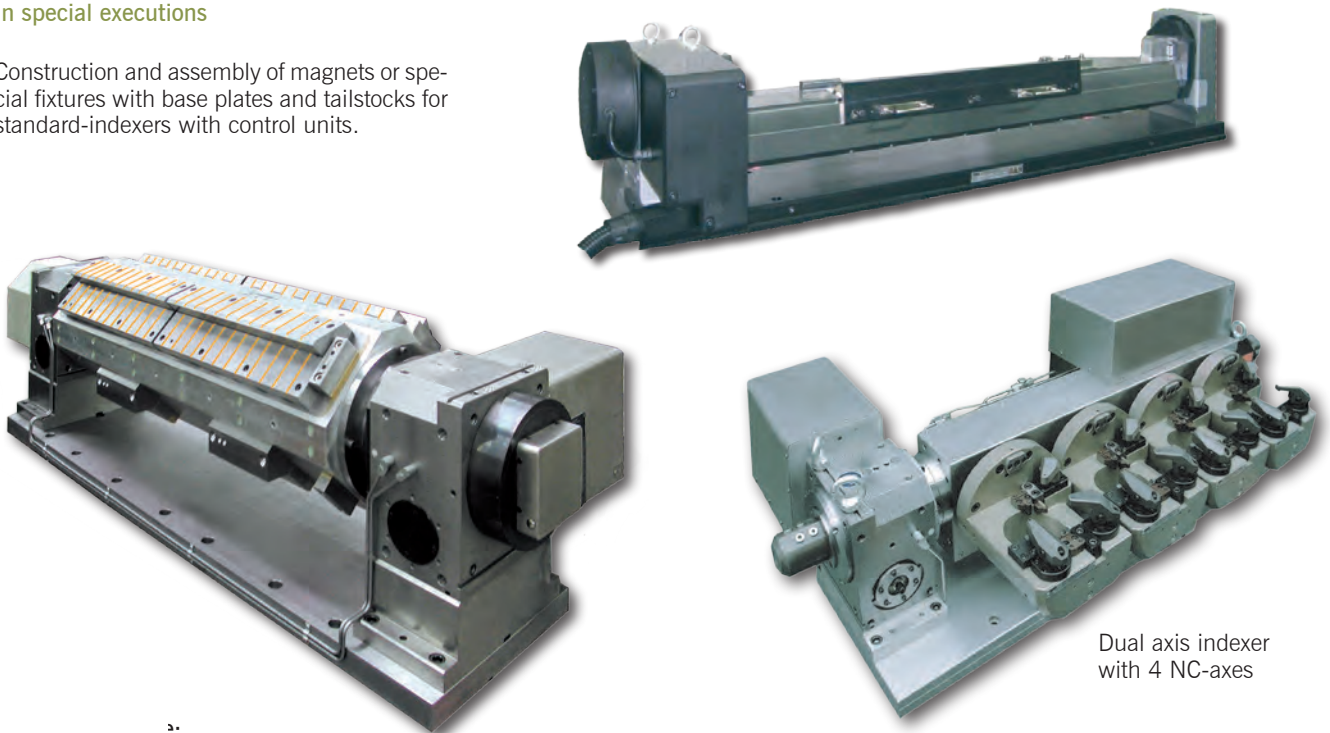
SAV - No. - Type - Mounting



## 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

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
<b>CIRCULAR GRINDING DEVICES</b>				
	SAV 434.80	Precision sine circular grinder	Complete with tailstock, adjustable according to the sine principle	22
	SAV 434.81	Precision sine circular grinder	With sine setting	23
	SAV 434.83	Precision sine circular grinder	With sine setting	24
	SAV 434.85	Precision circular grinder	With manual drive	25
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	SAV 439.62	3-Jaw chuck	Accessories circular grinding / indexing heads	27
	SAV 439.63	4-Jaw chuck	Accessories circular grinding / indexing heads	27
	SAV 439.64	Face plate	Accessories circular grinding / indexing heads	27
	SAV 439.66	Collet - Deckel No. 355 E	Accessories circular grinding / indexing heads	27
	SAV 439.68	Nuts for collets	Accessories circular grinding / indexing heads	27
	SAV 439.69	Centre Point	Accessories circular grinding / indexing heads Fixed, tailstock-mounted for circular grinders	28
	SAV 439.70	Centre Point	Accessories circular grinding / indexing heads Spring-loaded, tailstock-mounted for circular grinders	28
	SAV 439.71	Centre Point	60° point angle, with drive pin. Spindle-mounted with flange	28
	SAV 439.72	Sine plate	With clamping fixture for circular grinders	28
	SAV 439.73	3-Jaw, quick-action chuck	Accessories circular grinding / indexing heads	28

## PRECISION SINE CIRCULAR GRINDER

SAV 434.80

Complete with tailstock, adjustable according to the sine principle

### 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:

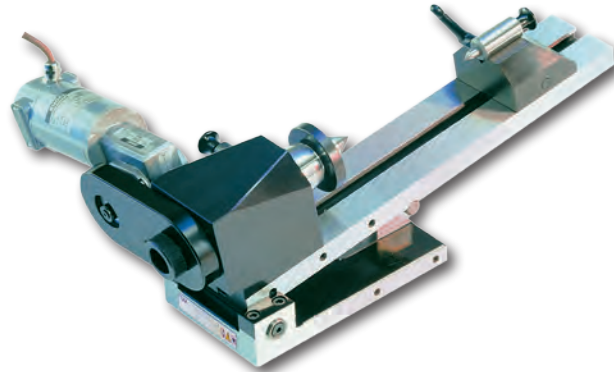
- Schaublin 470 E (Sch)
- ISO 30 taper (SK 30)
- Deckel 355 E (D)

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.

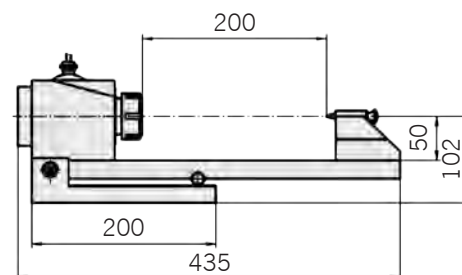
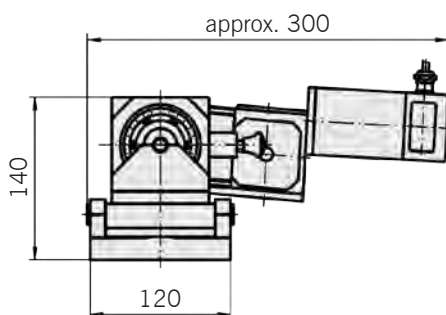
With indexing device 12 x 30° via index pins, Other divisions available upon request. Sine swivel range from 0° - 45°.



The photo shows the execution with a spindle-mounted centre point (accessory)



Control unit SAV 875.40  
W x H x L = 170 x 140 x 230



Base area	in mm	200x120
Height horizontal	in mm	140
Swivel range	in °	0 - 90
Setting with end-gauges	in °	to 45
Distance between centres	in mm	200
Height to centre	in mm	50
RPM	in 1/min	0 - 333
Spindle concentricity	in mm	0,003
Weight	in kg	15,5
Weight Control unit	in kg	4,8

### 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



## PRECISION SINE CIRCULAR GRINDER

SAV 434.81

### 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.

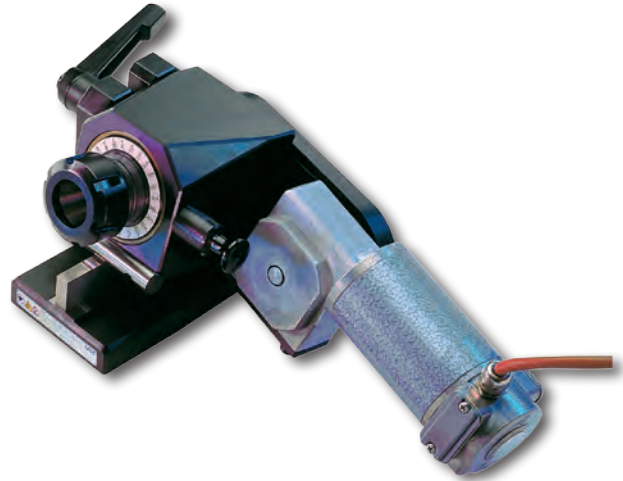
With Spindle mountings:

- Schaublin 470 E (Sch)
- ISO 30 taper (SK 30)
- Deckel 355 E (D)

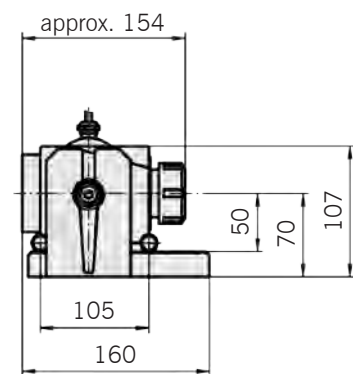
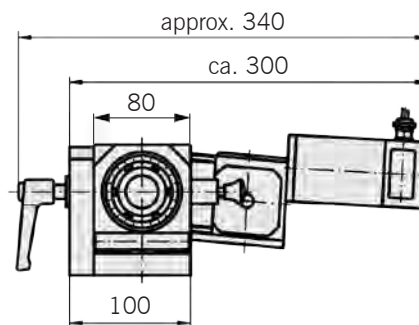
Control unit SAV 875.40, included in delivery.  
Stagelessly adjustable 24 Volt Electro-Motor from 0 - 333 1 / min.

Right / left rotation.

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



Control unit SAV 875.40  
W x H x L = 170 x 140 x 230



#### 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  
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 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

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

## PRECISION SINE CIRCULAR GRINDER

SAV 434.83

### 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.

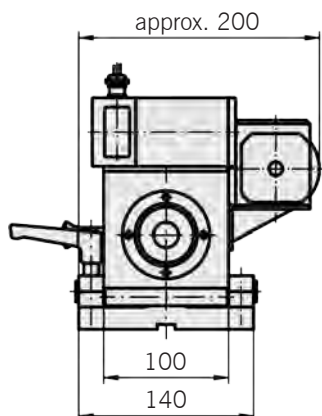
With retaining holes 4 x 90°. Upon request with raster indexation for use as an indexing head – surcharge applies.

Sine swivel range from 0° - 35°.

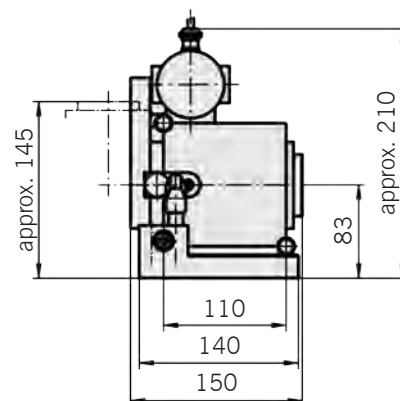
Modular system. Special mountings and executions according to your specifications can be supplied. Suitable for concentricity testing.



Control Unit SAV 875.40  
W x H x L = 170 x 140 x 230



Spindle height	in mm	83
Length	in mm	150
Width incl. Motor	in mm	200
Height incl. Motor	in mm	210
Height vertical	in mm	145
RPM	in 1/min	0 - 200
Weight	in kg	13



#### 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

#### Ordering example:

Precision sine circular grinder SAV 434.83 - SK 40  
Designation SAV - No. - Mounting

## PRECISION CIRCULAR GRINDER

SAV 434.85

With manual drive

### 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,

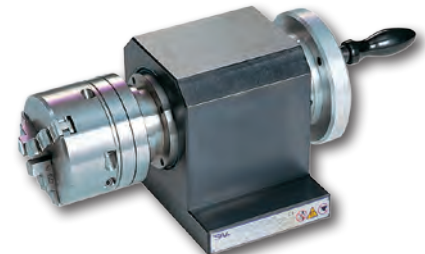
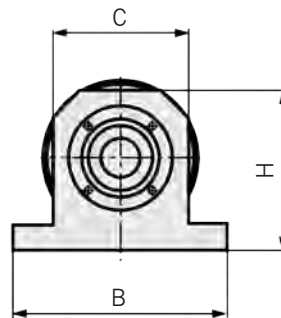
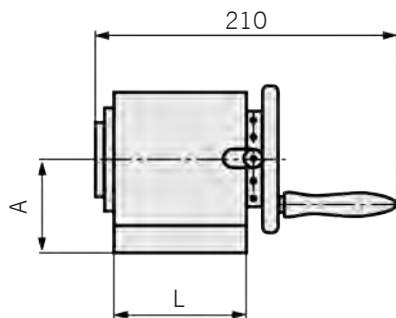
Divisions according to customer specifications.



Size 200  
with ISO 40-mounting



Size 200 with Deckel-mounting



Size 200 with 3-Jaw chuck (accessory)

### 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

Size	Dimensions in mm					Weight in kg
	A	L	B	H	C	
100	60	105	100	100	80	8
200	70	110	150	120	100	10

Concentricity = 0,003 mm

### 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:

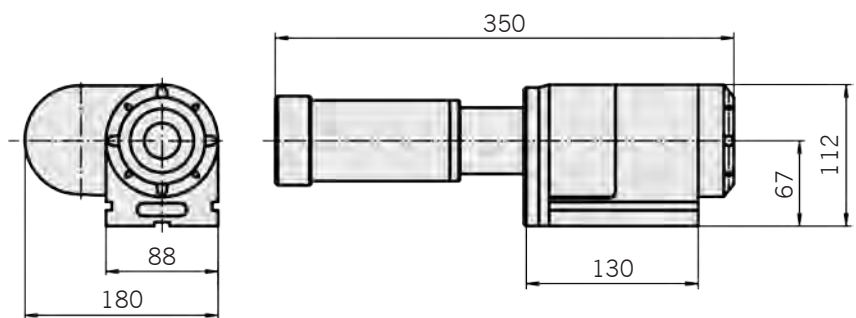
SAV 439.72 - T 100 - S

#### 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



### Precision circular grinder:

Length	in mm	130
Width	in mm	180
Height	in mm	112
Overall length incl. Motor	in mm	350
Spindle height	in mm	67
Spindle concentricity	in mm	0,002
RPM	in 1/min	70 - 430
Weight	in kg	8,9

### Control unit:

Width	in mm	230
Height	in mm	70
Depth	in mm	112
Weight	in kg	2,2

### Ordering example:

Precision sine circular grinder SAV 434.87  
Designation SAV - No.

## ACCESSORIES CIRCULAR GRINDING / INDEXING HEADS

SAV 439.62/.63  
/.64/.66/.68

### Sonder-Zubehör

#### 3-Jaw chuck

SAV 439.62

Execution - Adjustable (E)

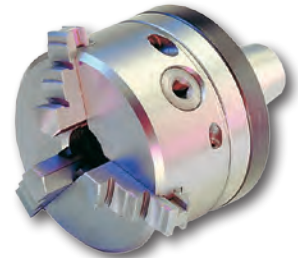
Execution - Fixed (F)

Diameter A = 80 mm or A = 100 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

SAV 439.63

Diameter A = 80 mm or A = 100 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

SAV 439.64

Diameter A = 90 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

SAV 439.66

S 20 x 2

Clamping range from D = 0.5 mm to 18.0 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



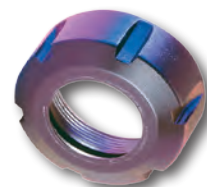
#### Nuts for Collet 470 E

SAV 439.68

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

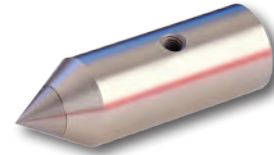
SAV 439.69/.70  
/.71 /.72 /.73

### Special accessories

#### Centre Point

SAV 439.69

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



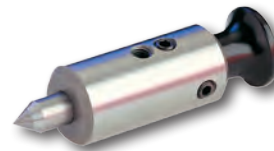
#### Ordering example:

Centre Point SAV 439.69  
Designation SAV - No.

#### Centre Point

SAV 439.70

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

SAV 439.71

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) .



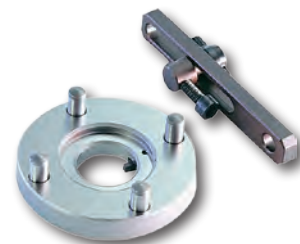
#### Ordering example:

Centre Point SAV 439.71 - Sch  
Designation SAV - No. - Flange

#### Sine plate

SAV 439.72

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

SAV 439.73

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

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
<b>ZERO SETTER</b>				
	SAV 483.02	Zero Setter- THE ORIGINAL	Vertical and horizontal	30
<b>ROLLER BLOCKS</b>				
	SAV 483.20	Precision roller blocks	For static balancing	31

## 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:

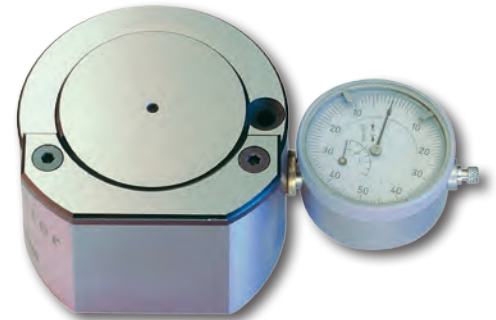
Housing and spring-loaded measuring surface made from hardened tool steel; precision ground. Supplied complete with dial gauge (reading accuracy 0.01 mm) in a rubber storage case. A version with a stop for horizontal application of the milling tool is available under Order No.: SAV 483.02 - NE 2

#### Usage:

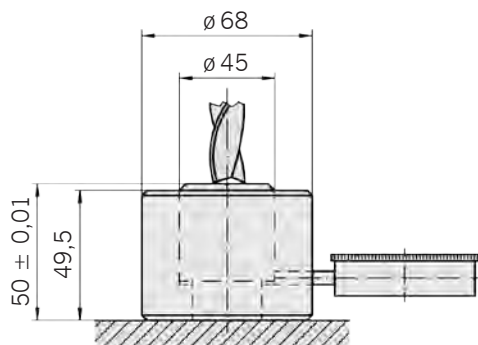
1. Bring the spring-loaded measuring surface and the reference surface of the device to the same height using a straight edge and set the dial gauge pointer to -0.50.
2. Place the zero setter NE1 with the base surface on the workpiece to be machined. When setting the reference point for the horizontal 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  $\pm$  0.01 mm above the workpiece to be machined (NE 1), or it is up to  $\pm$  0.01 mm above the workpiece edge (NE 2). The reference point can now be entered into the machine control unit



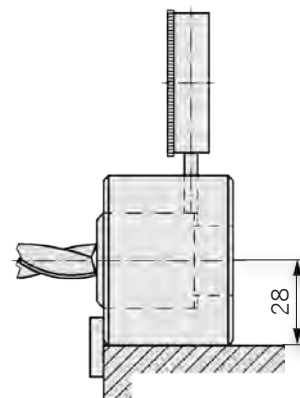
Type NE 1 for vertical setting



Type NE 2 for horizontal setting



Type NE 1



Type NE 2

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

## PRECISION ROLLER BLOCKS

SAV 483.20

### For static balancing

#### Application:

For the static balancing of grinding discs, fly-wheels, 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:

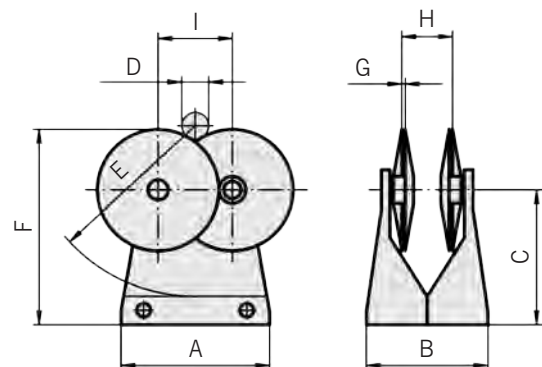
The hardened and ground roller discs are seated in precision ball bearings.

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.



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

#### Ordering example:

Precision roller block set SAV 483.20 - 400  
Designation SAV - No. - Loading capacity



## CONDITIONS OF SALE AND DELIVERY

### 1. General and contract conclusion

a) all agreements and offers are based on our conditions; they apply as accepted through placement of order or acceptance of the supply. Deviating conditions of the customer, which we do not accept expressly in writing, are noncommittal for us, even if we do not contradict explicitly.

b) For the scope of supply our confirmation of order is determining. Verbal, telephonically, telegraphic and telefaxed special agreements and additional contract modifications have validity only if they are confirmed in writing by us. The same applies to assured 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 contradict to these. Hereunder 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 Germany. Area of jurisdiction for all from the contractual relation as well as law cases rising over its developing and its 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 always subject to the German material right under exclusion of international purchase rights.

e) All written or oral offers are, unless no other agreements are made or confirmed by us, not binding.

### 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 increase 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 questions 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 and private 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 foreseen 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 in delay of the customer from this or another contract.

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 explicitly 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% 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 is 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, interests according the usual bank interest on debit 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 delays, starting 14 days after announcement of readiness for dispatch, the additional charges for storage, care and shifting of the commodities can be charged.

With payments by instalments 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 one of our assigned transporters, however latest at leaving of our works or warehouse. The packing takes place with best care. The dispatch 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 loose 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 will, under exclusion of further guarantee claims of the customer, according our choice supply a replacement or have the commodity reworked.

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-fulfilment 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 expectation 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 the latest within 8 days after receipt of the commodities, with non-recognized defects immediately after determination - in writing.

Costs of the rework are for our account up to the value of the defective part, beyond that it 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 unknown 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 delivery 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 these 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 tortious 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 the 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. § 950 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 upto 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 fulfils 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 or the in advance resigned demands, 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.

## NOTES

## THE SAV PRODUCT RANGE



### CATALOGUE I: SAV-MAGNETIC WORKHOLDING

Permanent, 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



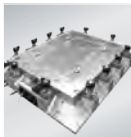
### CATALOGUE V: SAV-STANDARD PARTS

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



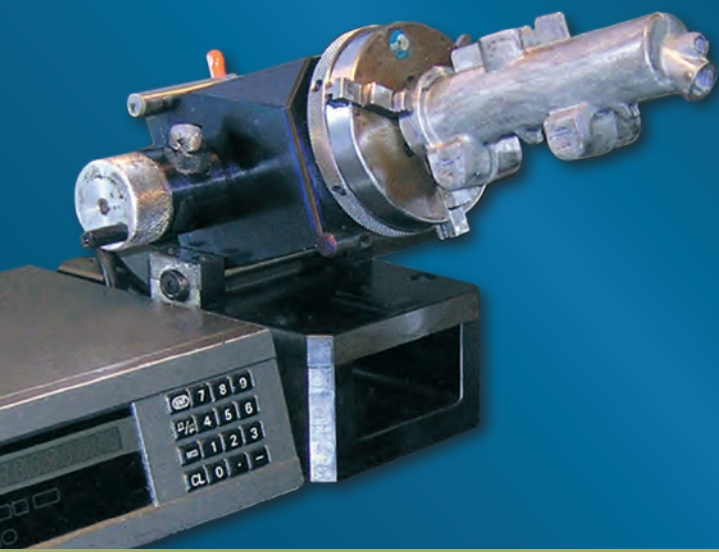
### CATALOGUE IX: SAV-DRESSING AND CIRCULAR GRINDING

Dressing, circular grinding, indexing tables



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