

ROTARY WORKHOLDING

FROM STANDARD TO COMPLETE SOLUTIONS

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Thank you for reporting any errors.

If not otherwise specified, standard tolerances shall apply:
Linear dimensions according to DIN ISO 2768-1-m
Geometric and positional tolerances according to DIN ISO 2768-2-K
Metric ISO-screw threads according to the tolerance classes medium

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Pictograms for the appropriate machining operations



CATALOGUE III

ROTARY WORKHOLDING

FROM STANDARD TO COMPLETE SOLUTIONS



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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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:

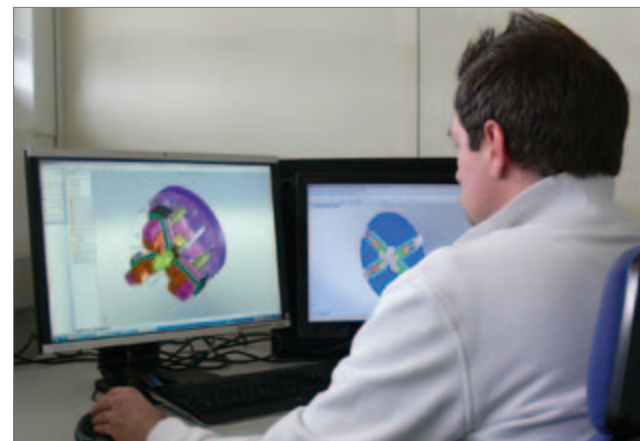
- **Magnetics**
- **Hydraulics**
- **Mechanics**
- **Vacuum technologies**
- **Automation technologies**
- **Control technologies**
- **Stationary and rotating workholding technologies**



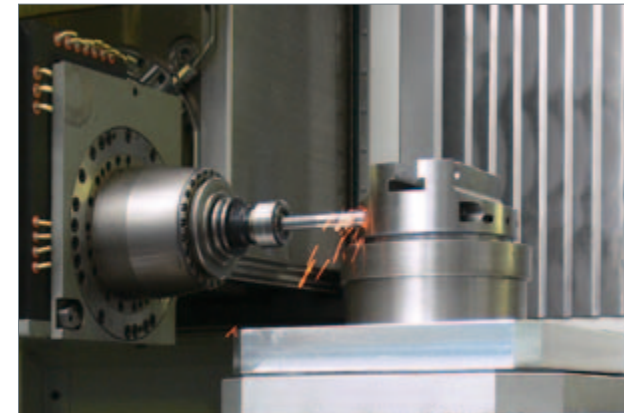
The engineering of standard and special solutions

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 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

FROM STANDARD TO COMPLEX INTEGRATION

SAV PROVIDES

- ➔ Quality, operational safety and longevity
- ➔ Cost effectiveness
- ➔ Precision solutions
- ➔ Competence in problem solving
- ➔ High clamping forces appropriate to the workpiece characteristics
- ➔ Flexibility through R&D and our own production technologies
- ➔ Innovation – new technologies
- ➔ Applications “Made in Germany”

WORKHOLDING SOLUTIONS FOR TURNING, GRINDING AND MILLING

- ➔ Universal and flexible
- ➔ Low wear and low maintenance
- ➔ Combined solutions
- ➔ Automation
- ➔ Adaptable for every spindle – specially for your machinery
- ➔ Comprehensive solutions
- ➔ On-site service and installation
- ➔ Workpiece and process orientated solutions
- ➔ Optimization of setup times

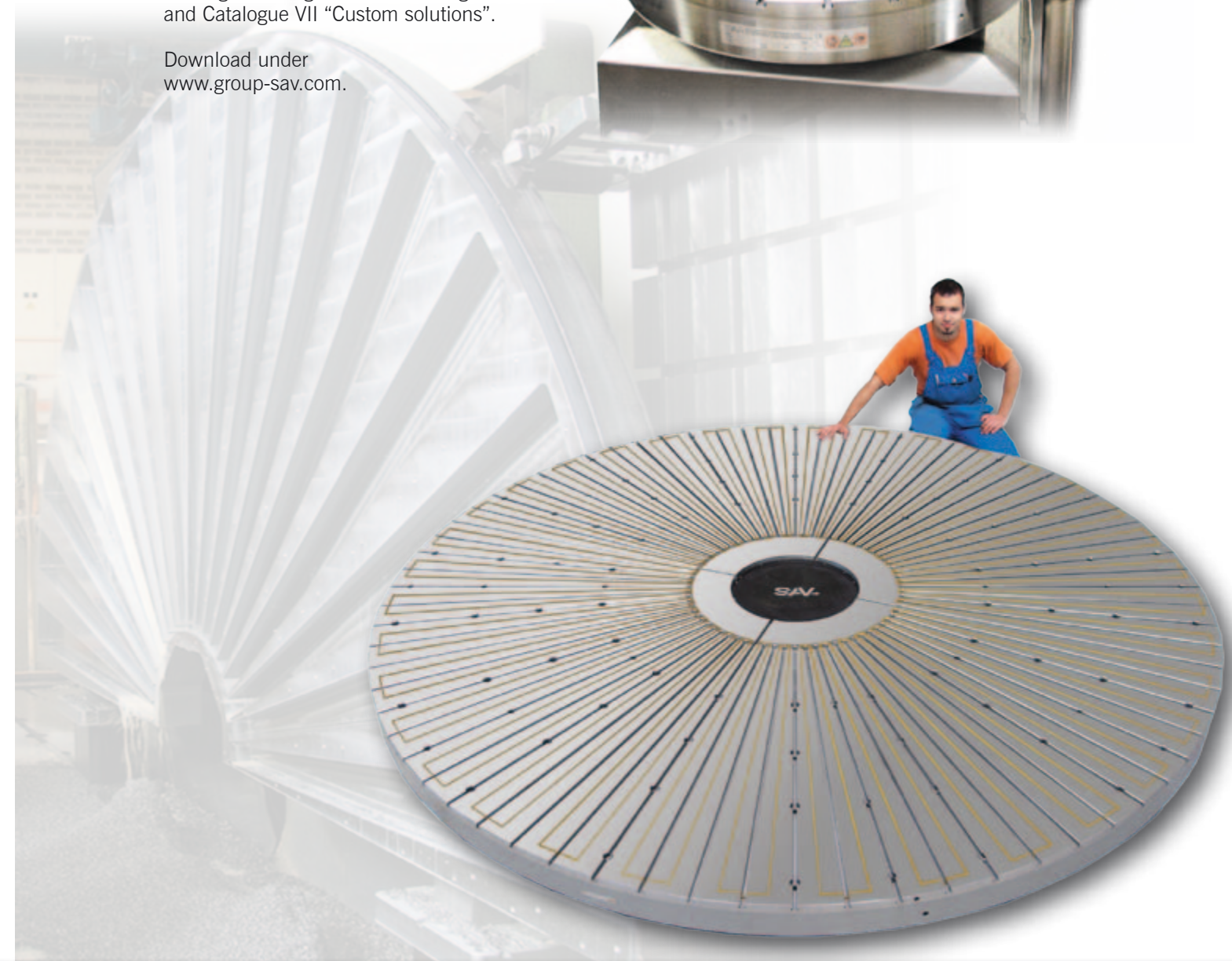
MAGNETIC ROTARY WORKHOLDING

We develop and produce circular magnets including individual solutions for your workpieces and operating requirements



Please request the SAV catalogues Catalogue I “Magnetic workholding” and Catalogue VII “Custom solutions”.

Download under www.group-sav.com.



CONSTRUCTION PRINCIPLES FOR CHUCKS

CHAPTER OVERVIEW

CHAPTER 1

Pages 11 – 40

1

STANDARD CHUCKS AND ACCESSORIES

	SAV-ART.-No.	DESCRIPTION	COMMENTS	PAGE
	260.10	3 and 4 jaw scroll chucks Cushman System	Conventional and cyclically-controlled machines Stagelessly variable jaw adjustment	12 - 14
	269.10 269.11	Jaws for scroll chucks - Cushman System - Wescott System	—	15 19
	260.11	3 and 4 jaw scroll chucks Wescott System	Conventional and cyclically-controlled machines Stagelessly variable jaw adjustment Each individual jaw has an adjustment spindle	16 - 18
	260.20	F+ Manually operated chucks	3-jaw wedge bar chucks suitable for all standard lathes	20 - 21
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	269.50	Accessories – Air supply pipe	For precision 2 and 3-jaw chucks	37
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Ordering example:

SCROLL CHUCK	LEVER CHUCK
Scroll - large clamping range	Lever - large jaw stroke possible - with centrifugal force compensation
WEDGE HOOK CHUCK	WEDGE BAR CHUCK
Wedge hook - with centrifugal force compensation - suitable for large cutting forces	Wedge bar - force exerted directly at the clamping position

3-JAW SCROLL CHUCK

Cushman System, cylindrical mounting according to DIN 6350

Application:

To clamp round workpieces, in particular on conventional and cyclically-controlled machines. The jaws can be stagelessly adjusted across the whole clamping range.

Features:

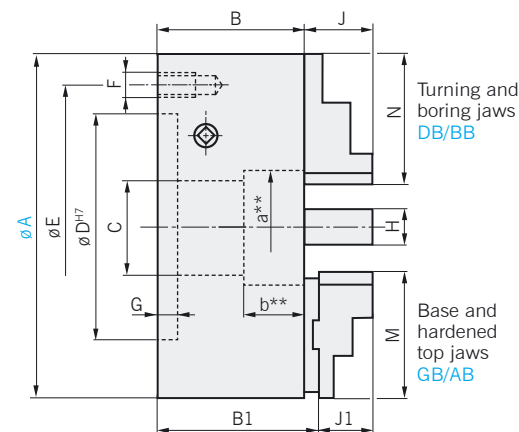
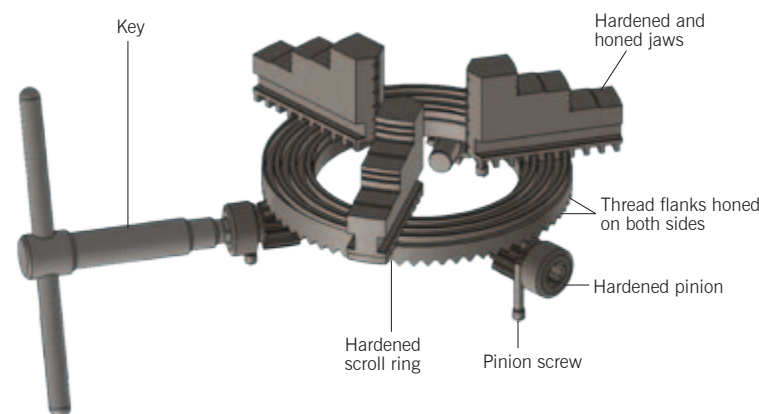
- Steel-bodied scroll chuck
- Cylindrical mounting according to DIN 6350 or short taper for DIN 55026 / 55027 and 55029
- Rotational speed, clamping forces and accuracy comply with DIN 6386 Part 1-class 1
- Chuck sizes up to $\varnothing 1600$ mm Standard
- From $\varnothing 630$ mm available with extended base jaws.

Delivery scope:

- With one-piece turning and boring jaws "DB" or
- With base and hardened top jaws "GA"
- Tensioning key



Clamping force transmission system



Dimensions in mm													Revolutions	Weight in kg	
A	B	B1	C	D ^{H7}	E	F	G	H	J	J1	M	N	in min ⁻¹	DB	GA
100	50	55,4	20	70	83	3 x M8	3	12	16	26,5	42	42	6100	3,0	3,2
125	60	65	32	95	108	3 x M8	4	20	21	34,4	55	52	4900	5,0	5,5
160	66	71	42	125	140	3 x M10	4	19,8	26	42	66	66	3800	8,5	9,5
200	80	85	55	160	176	3 x M10	4	26	32	46	80	80	3000	15,5	17,5
250	90	95	76	200	224	3 x M12	5	25,8	40	50	102	100,5	2450	25,0	28,0
315	90	95	105	260	286	3 x M16	5	32	50	60	123	120	1940	47,0	50,0
350	93	101	110	300	325	6 x M12	5	38	50	81,6	145	135	1750	53,0	56,0
400	93	101	130	330	360	6 x M14	5	38	50	81,6	145	135	1530	67,0	70,0
500	106	114	130*	420	460	6 x M16	6	42	52	78	127	160	1220	118	121
600	108	116	190*	520	560	6 x M16	6	50	52	78	127	160	1020	182	185
630	115	108	190*	545	586	6 x M16	7	55	-	83	207	-	970	-	213
700	118	110	190*	620	660	6 x M16	8	55	-	83	207	-	875	-	223
800	138	130	190	285	330	6 x $\varnothing 21$	10	55	-	83	207	-	765	-	400

* Can be delivered with a larger bore

** Can be bored-out, max. dimensions a and b upon request

Chucks with a frontal fixing upon request or on-site adaptations possible.
Chucks from $\varnothing 800$ mm – please enquire.

Ordering example:

3 Jaw scroll chuck SAV 260.10 - 200 - 3 - DB/BB
Designation SAV - No. - A - Number of jaws - Jaw specification

4-JAW SCROLL CHUCK

Cushman System, cylindrical mounting according to DIN 6350

Application:

To clamp round and angled workpieces, in particular on conventional and cyclically-controlled machines. The jaws can be stagelessly adjusted across the whole clamping range.

Features:

- Steel-bodied scroll chuck
- Cylindrical mounting according to DIN 6350 or short taper for DIN 55026 / 55027 and 55029
- Rotational speed, clamping forces and accuracy comply with DIN 6386 Part 1-class 1
- Chuck sizes up to $\varnothing 1600$ mm Standard
- From $\varnothing 630$ mm with extended base jaws available upon request.

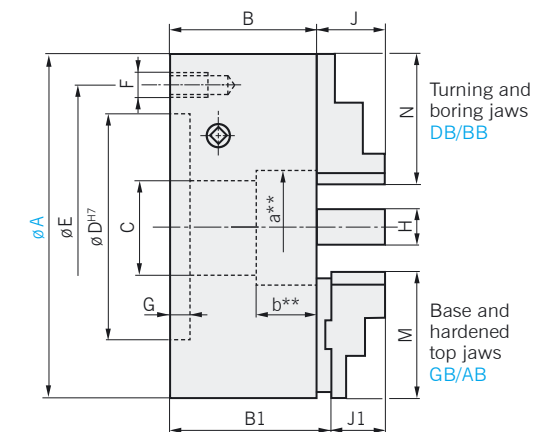
Delivery scope:

- With one-piece turning and boring jaws "DB" or
- With base and hardened top jaws "GA"
- Tensioning key



Clamping force transmission system

Analogue to the 3-jaw scroll chuck



Dimensions in mm													Revolutions	Weight in kg	
A	B	B1	C	D ^{H7}	E	F	G	H	J	J1	M	N	in min ⁻¹	DB	GA
100	50	-	20	70	83	3 x M8	3	15	17	-	-	42	6100	2,4	-
125	56	61	32	95	108	3 x M8	4	20	20	35	56	51	4900	4,2	4,2
160	65	70	40	125	140	6 x M10	4	20	32	38	67	70	3800	8,1	8,1
200	75	80	55	160	176	6 x M10	4	25	29	40	85	85	3000	14,1	14,1
250	85	92,5	80	200	224	6 x M12	5	28	34	45,5	105	105	2450	23,9	23,9
315	95	100	103	260	286	6 x M16	5	32	43	52	125	125	1940	40,3	40,3
400	105	113	136	330	362	6 x M16	6	36	55	59	145	145	1530	75,0	75,0
500	118	126	190	420	458	6 x M16	7	40	60	74,5	180	180	1220	112	112

** Can be bored-out, max. dimensions a and b upon request

Chucks with a frontal fixing upon request or on-site adaptations possible.
Chucks from $\varnothing 500$ mm – please enquire.

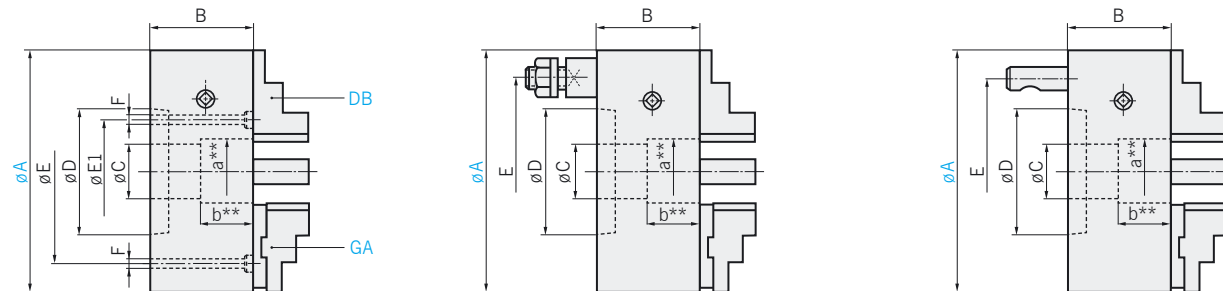
Ordering example:

4-Jaw scroll chuck SAV 260.10 - 200 - 4 - GB/AB
Designation SAV - No. - A - Number of jaws - Jaw specification

3 or 4-JAW SCROLL CHUCK

SAV 260.10

Cushman System,
Short taper fixing



Direct mounting **K** – DIN55026

Bayonet mounting **J** – DIN55027

Camlock mounting **D** – DIN55029

Dimensions in mm										Spindle size	Format	Jaws	Revolutions in min ⁻¹	Weight in kg	
A	B	C	D	E	E1	F	G	H	I	J	K	3	4	DB	GA
125	60	32	54,0	75,0	-	-	-	-	-	-	-	x	-	4900	8,5
125	60	32	54,0	70,7	-	-	-	-	-	-	-	x	-	4900	8,5
125	60	32	63,5	85,0	-	-	-	-	-	-	-	x	-	4900	8,5
125	60	32	63,5	82,6	-	-	-	-	-	-	-	x	-	4900	8,5
160	66	32	63,5	-	47,6	3 x 10	4	K	-	-	-	x	-	3800	13
160	66	42	63,5	85,0	-	-	4	-	J	-	-	x	-	3800	13
160	66	42	63,5	82,6	-	-	4	-	-	D	-	x	-	3800	13
160	66	42	82,6	104,8	-	-	5	-	J	D	-	x	-	3800	13
200	80	42	63,5	82,6	-	6/4 x 11	4	K	-	-	-	x	x	3000	17,5
200	80	55	63,5	85,0	-	-	4	-	J	-	-	x	x	3000	17
200	80	55	63,5	82,6	-	-	4	-	-	D	-	x	x	3000	17
200	80	42	82,6	-	61,9	3/4 x 11	5	K	-	-	-	x	x	3000	17,5
200	80	55	82,6	104,8	-	-	5	-	J	D	-	x	x	3000	17
200	80	42	106,4	-	82,55	6/4 x 13,5	6	K	-	-	-	x	x	3000	17,5
200	80	55	106,4	133,8	-	-	6	-	J	D	-	x	x	3000	17
250	90	60,5	106,4	-	82,6	6/4 x 13,5	6	K	J	D	-	x	x	2450	28
250	90	76,0	106,4	133,4	-	-	6	-	J	D	-	x	x	2450	29
250	90	60,5	139,7	-	111,1	3/4 x 17,5	8	K	-	-	-	x	x	2450	28
250	90	76	139,7	171,5	-	-	8	-	J	D	-	x	x	2450	28
315	90	100	106,4	133,4	-	3/8 x 13,5	6	K	J	D	-	x	x	1940	47
315	90	75	139,7	-	111,1	6/4 x 17,5	8	K	-	-	-	x	x	1940	47
315	90	105	139,7	171,5	-	-	8	-	J	D	-	x	x	1940	47
400	105	100	106,4	133,4	-	6/8 x 13,5	6	K	J	D	-	x	x	1530	82
400	105	110	139,7	171,5	-	6/8 x 17,5	8	K	J	D	-	x	x	1530	82
400	105	110	196,9	-	165,1	6/4 x 21	11	K	-	-	-	x	x	1530	82
400	105	110	196,9	235,0	-	-	11	-	J	D	-	x	x	1530	79
500	126	130	139,7	171,5	-	6/8 x 17,5	8	K	J	D	-	x	x	1220	140
500	126	130*	196,9	235,0	165,1	6/8 x 21	11	K	J	D	-	x	x	1220	140
500	126	190	285,8	330,2	247,7	6/8 x 23	15	K	J	D	-	x	x	1220	140
630	136	130	139,7	171,2	-	6/8 x 17,5	8	K	J	D	-	x	x	1020	-
630	136	190	196,9	235,0	-	6/8 x 21	11	K	J	D	-	x	x	1020	-
630	136	190*	285,8	330,2	-	6/8 x 23	15	K	J	D	-	x	x	1020	-
630	136	190*	412,8	463,6	383,3	6/4 x 26	20	K	J	D	-	x	x	1020	-

* Can be delivered with a larger bore; ** Can be bored-out, max. dimensions upon request. Chucks from ø 630 mm – please enquire

Tensioning key and fixings included in the delivery.

Format **DB/BB** – with turning and boring jaws

Format **GB/AB** – with base and hardened top jaws

Ordering example:

3-Jaw scroll chuck SAV 260.10 - 200 - 3 - 5K - DB/BB

Designation SAV - No. - A - Number of jaws - Spindle size - Format - Jaw specification

CLAMPING JAWS FOR SCROLL CHUCKS

SAV 269.10

Cushman System, to SAV 260.10

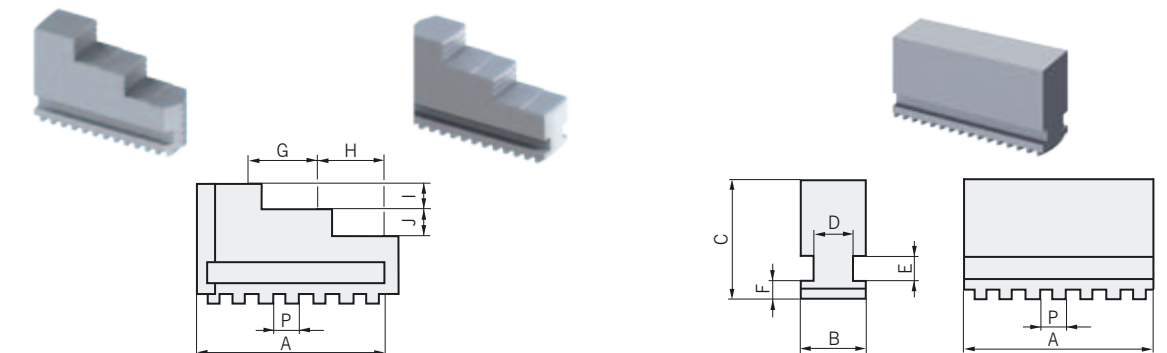
▶ TURNING JAW – **DB**

graded inside

BORING JAW – **BB**

graded outside

▶ BLOCK JAW, SOFT – **WBB**

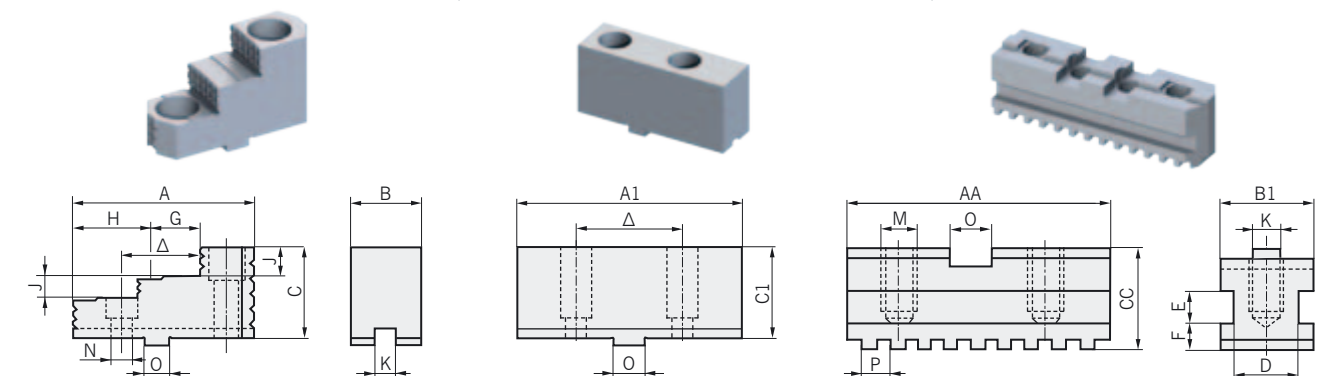


Dimensions in mm											
Chuck-ø	A	B	C	D	E	F	G	H	I	J	P
100	42	12	32	7	6	6	15,5	15,5	6	6	6
125	52	20	42	11	8	8	18	19	8	9	6
160	66	20	48	11	8,4	7,6	24	23	10	10	8
200	80	26	59	15	10	10	26	28	13	13	8
250	100	26	68	15	10	9,6	35	35	16	16	10
315	120	32	84	21	12	12	40	46	20	20	10
400	135	38	83	22	12	11	47	47	20	20	10
500	158	42	91	28	14	13	54	56	21	21	12
600	158	50	91	35	14	13	54	56	21	21	12

▶ TOP JAW, HARD – **HAB**

TOP JAW, SOFT – **WAB**

BASE JAW – **GB**



Dimensions in mm																		
Chuck-ø	A	A1	AA	B	B1	C	C1	CC	D	E	F	G	H	J	K	M	N	O
100	43	53	40	14	12	24,5	28	24	7	6	6	17	18	6	7,9	6	6,5	9,5
125	56	60	49	22	20	35	33	30	11	8	8	24	26	8	7,9	8	9	13
160	66	78	64	20	20	42	38	30	11	8,4	7,6	20	25	12	7,9	8	9	13
200	80	90	78	26	26	46	45	35	15	10	10	25	27	12	7,9	8	9	13
250	95	106	100	32	26	48	52	36	15	10	9,6	38	34	12	13	12	13	19
315	110	120	120	37	32	51	55	42	21	12	12	43	43	13	13	12	13	19
400	127	140	120	42	38	57	80	37	22	12	11,3	38	53	18	13	16	17	19
500	127	160	165	42	42	67	85	48	28	14	13,3	35	44	21	13	20	21	19
600	127	160	203	52	50	67	85	48	28	14	13,3	35	44	21	13	20	21	19

Base "GB" and hardened top jaws „HAB“ or turning „DB“ and boring jaws „BB“ included in the chuck delivery.

Ordering example:

Base Jaw k SAV 269.10 - 200 - 3 - GB

Designation SAV - No. - Chuck diameter - Jaw specification

3-JAW SCROLL CHUCK

Wescott System, with adjustable ancillary jaws;
Cylindrical centering mounting DIN 6351

Application:

To clamp round workpieces, in particular on conventional and cyclically-controlled machines. The jaws can be centrally adjusted across the whole clamping range. In addition, the jaws are independently adjustable.

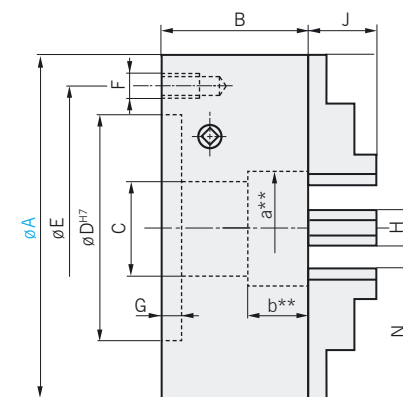
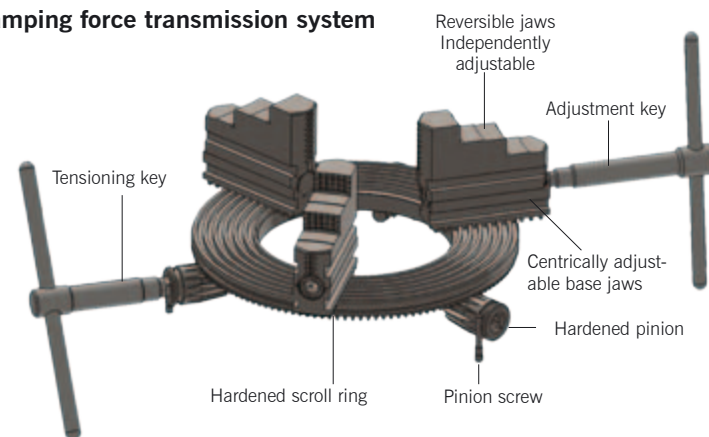
Features:

- Steel-bodied scroll chuck
- Cylindrical mounting according to DIN 6351 or short taper for DIN 55026 / 55027 and 55029
- Rotational speed, clamping forces and accuracy comply with DIN 6386 Part 1-class 1
- Chuck sizes up to $\varnothing 1600$ mm Standard
- From $\varnothing 700$ mm available with extended base jaws.

Delivery scope:

With hardened base jaws and hardened, reversible top jaws
Tensioning and adjustment keys

Clamping force transmission system



Dimensions in mm												Revolutions in min ⁻¹	Weight in kg
A	B	C	D ^{H7}	E	F	G	H	J	N	a**	b**		
160	87	45	125	142,5	3 x M10	4	23	30	63	52	35	3800	15
200	99	56	160	180	3 x M12	4	30	36	78	65	40	3000	19
250	114	75	200	225	3 x M12	5	34	39	93	85	45	2450	35
315	118	100	250	270	3 x M14	5	38	42	108	120	50	1940	55
400	125	130	330	360	6 x M14	6	38	52	135	155	50	1530	89
500	145	130*	420	460	6 x M16	6	42	60	160	160	60	1220	165
600	147	190*	520	560	6 x M16	6	50	75	160	230	60	1020	200
630	149	190*	545	586	6 x M16	7	50	90	200	230	70	970	235
700	149	190*	620	660	6 x M16	8	50	90	200	300	70	875	360
800	169	190	285	330	6 x $\varnothing 21$	12	70	95	207	360	95	765	450

* Can be delivered with a larger bore; ** Can be bored-out, max. dimensions a and b

Chucks with a frontal fixing upon request or on-site adaptations possible.

Chucks from $\varnothing 800$ mm – please enquire. Special formats to $\varnothing 3000$ mm deliverable.

Ordering example:

3-Jaw scroll chuck SAV 260.11 - 200 - 3
Designation SAV - No. - A - Number of jaws

SAV 260.11



4-JAW SCROLL CHUCK

Wescott System, with adjustable ancillary jaws;
Cylindrical centering mounting DIN 6351

Application:

To clamp round and cubic workpieces, in particular on conventional and cyclically-controlled machines. The jaws can be centrally adjusted across the whole clamping range. In addition, the jaws are independently adjustable.

Features:

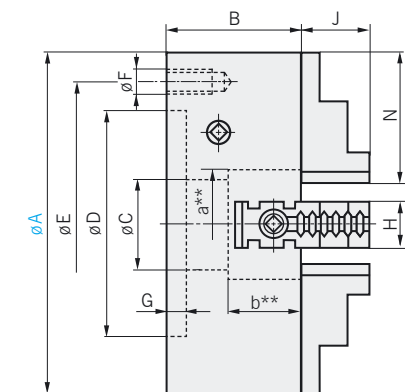
- Steel-bodied scroll chuck
- Cylindrical mounting according to DIN 6351 or short taper for DIN 55026 / 55027 and 55029
- Rotational speed, clamping forces and accuracy comply with DIN 6386 Part 1-class 1
- Chuck sizes up to $\varnothing 1600$ mm Standard
- From $\varnothing 700$ mm available with extended base jaws.

Delivery scope:

With hardened base jaws and hardened, reversible top jaws
Tensioning and adjustment keys

Clamping force transmission system

Analogue to the 3-jaw scroll chuck



Dimensions in mm												Revolutions in min ⁻¹	Weight in kg
A	B	C	D ^{H7}	E	F	G	H	J	N	a**	b**		
160	87	45	125	142,5	4 x M10	4	23	30	63	52	35	3800	15
200	99	56	160	180	4 x M12	4	30	36	78	65	40	3000	19
250	114	75	200	225	4 x M12	5	34	39	93	85	45	2450	35
315	118	100	250	270	4 x M14	5	38	42	108	120	50	1940	55
400	125	130	330	360	4 x M14	6	38	52	135	155	50	1530	89
500	145	130*	420	460	6 x M16	6	42	60	160	160	60	1220	165
600	147	190*	520	560	6 x M16	6	50	75	160	230	60	1020	200
630	149	190*	545	586	6 x M16	7	50	90	200	230	70	970	235
700	149	190*	620	660	6 x M16	8	50	90	200	300	70	875	360
800	169	190	285	330	6 x $\varnothing 21$	12	70	95	207	360	95	765	450

* Can be delivered with a larger bore; ** Can be bored-out, max. dimensions a and b

Chucks with a frontal fixing upon request or on-site adaptations possible.

Chucks from $\varnothing 800$ mm – please enquire. Special formats to $\varnothing 3000$ mm deliverable.

Ordering example:

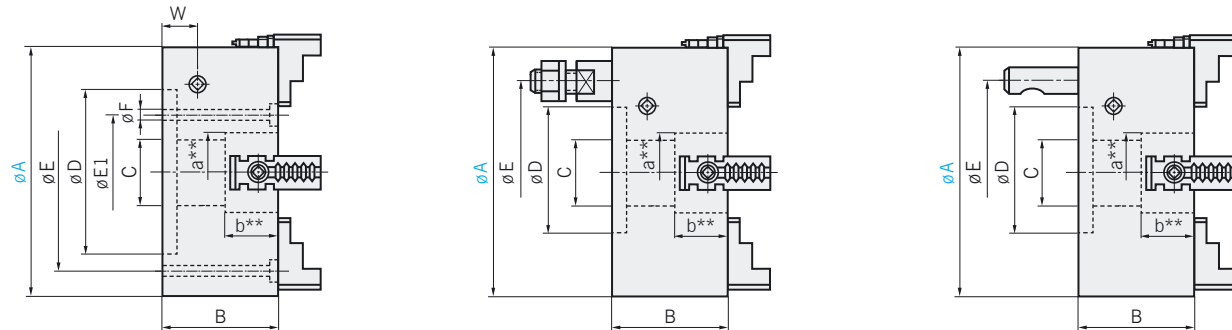
4-Jaw scroll chuck SAV 260.11 - 800 - 4
Designation SAV - No. - A - Number of jaws

SAV 260.11



3 or 4-JAW SCROLL CHUCK

Wescott System, with adjustable ancillary jaws;
Short taper fixing



Direct mounting **K** – DIN55026

Bayonet mounting **J** – DIN55027

Camlock mounting **D** – DIN55029

Dimensions in mm							Spindle size	Format			Jaws		Revolutions in min ⁻¹	Weight in kg
A	B	C	D	E	E1	F		K	J	D	3	4		
160	97	32	63,5	47,6	-	3/4 x 10	4	K	-	-	x	-	3800	16
160	97	45	63,5	85	-	-	4	-	J	D	x	x	3800	16
160	97	42	82,6	61,9	-	3/4 x 11	5	K	-	-	x	x	3800	16
160	97	45	82,6	104,8	-	-	5	-	J	D	x	x	3800	16
200	111	60,5	63,5	-	82,6	3/4 x 11	4	K	-	-	x	x	3000	21
200	111	56	63,5	85	-	-	4	-	J	D	x	x	3000	21
200	111	42	82,6	61,9	-	-	5	K	-	-	x	x	3000	21
200	111	56	82,6	104,8	-	-	5	-	J	D	x	x	3000	21
200	111	56	106,4	133,4	-	-	6	-	J	D	x	x	3000	21
250	126	60,5	106,4	-	82,6	6/4 x 13,5	6	K	-	-	x	x	2450	36
250	126	75	106,4	133,4	-	-	6	-	J	D	x	x	2450	36
250	126	75	139,7	171,5	-	-	8	-	J	D	x	x	2450	36
315	130	100	106,4	133,4	-	6/4 x 13,5	6	K	J	D	x	x	1940	62
315	130	75	139,7	111,1	-	6/4 x 17,5	8	K	-	-	x	x	1940	62
315	130	100	139,7	171,5	-	-	8	-	J	D	x	x	1940	62
400	137	100	106,4	133,4	-	6/4 x 13,5	6	K	J	D	x	x	1530	105
400	137	100	139,7	171,5	-	6/4 x 17,5	8	K	J	D	x	x	1530	105
400	137	110	196,9	-	165,1	6/4 x 21,5	11	K	-	-	x	x	1530	105
400	137	100	196,9	235	-	-	11	-	J	D	x	x	1530	105
500	165	130	139,7	171,5	-	6/4 x 17,5	8	K	J	D	x	x	1220	180
500	165*	130	196,9	235	165,1	6/4 x 21,5	11	K	J	D	x	x	1220	180
500	165	190	285,8	330,2	247,7	6/4 x 23,5	15	K	J	D	x	x	1220	180
630	169	130	139,7	171,5	-	6/4 x 17,5	8	K	J	D	x	x	970	280
630	169	190	196,9	235	-	6/8 x 21,5	11	K	J	D	x	x	970	280
630	169*	190	285,8	330,2	-	6/8 x 25,5	15	K	J	D	x	x	970	280
630	169*	190	412,8	463,6	368,3	6/8 x 26,5	20	K	J	D	x	x	970	280

* Can be delivered with a larger bore; ** Can be bored-out, max. dimensions upon request.
Tensioning key and fixings included in the delivery.

Ordering example:

Scroll chuck SAV 260.11 - 315 - 3 - 8K
Designation SAV - No. - A - Number of jaws - Spindle size - Format

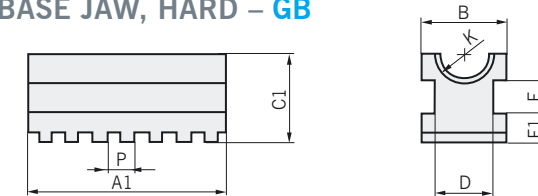
SAV 260.11

CLAMPING JAWS FOR SCROLL CHUCKS

SAV 269.11

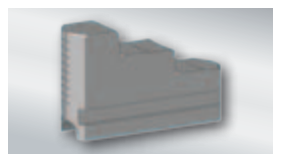
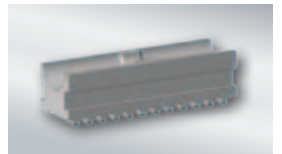
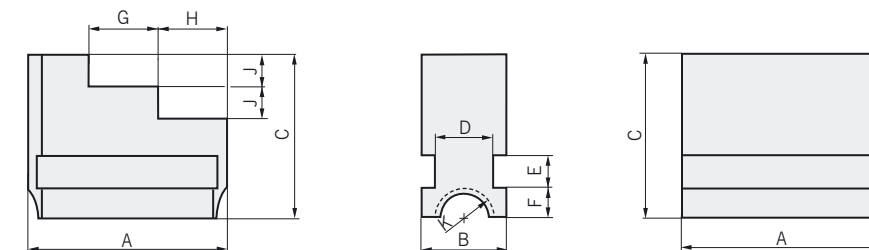
Wescott System, to SAV 260.11

► BASE JAW, HARD – **GB**

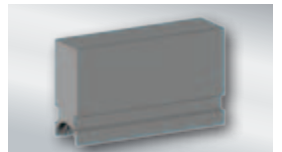


► REVERSIBLE TOP JAW, HARD – **AUB**

REVERSIBLE JAW, SOFT – **UB**

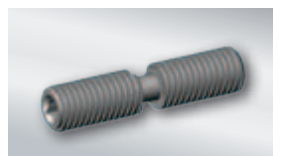
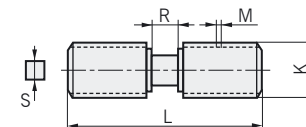


Reversible top jaw, hard



Reversible jaw, soft

► ADJUSTMENT SPINDLE – **S**



Chuck- ø	Dimensions in mm																	
	A	A1	B	C	C1	D	E	F	F1	G	H	J	K	L	M	P	R	S
160	63	60	23	45	24	15	9	8	8	23	23	11	14	60	3	7	10	6
200	78	73	30	62	29	20	10	10	9	27	27	13	20	73	3	8	10	8
250	93	86	34	69	34	23	12	10	10	33	33	15	26	86	4	10	12	10
315	108	100	38	72	35	27	12	12	11	38	38	15	28	100	4	10	15	12
400	135	125	38	82	35	27	12	12	11	48	48	20	28	125	4	10	15	12
500	160	145	42	93	41	29	14	15	13	55	55	21	30	145	5	12	16	12
600	160	145	50	115	41	35	14	15	13	60	60	30	32	145	5	12	18	14
700	200	200	50	127	41	35	14	15	13	70	70	34	32	200	5	12	18	14

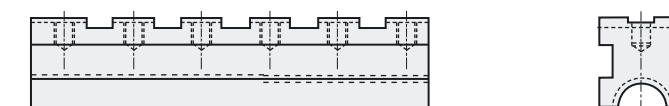
Base jaw **GB** and reversible top jaw **AUB** included in the scroll chuck delivery. Chuck sizes $\geq \varnothing 700$ mm delivered with extended base jaws.

Ordering example:

Reversible jaw, soft SAV 269.11 - 400 - 3 - UB
Designation SAV - No. - Chuck diameter - Jaw specification

Chuck sizes $\geq \varnothing 700$ mm

► EXTENDED INTERMEDIATE JAW – **LZB**

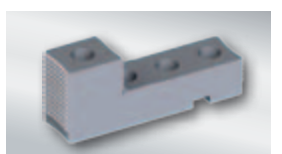
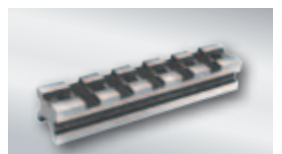


Please enquire for prices and dimensions.

► EXTENDED TOP JAW, HARD – **LAB**



Please enquire for prices and dimensions.



F+ MANUALLY OPERATED CHUCK

With cylindrical centering mounting

Application:

Manually operated chucks are suitable for all standard lathes and by means of a intermediate flange fit all spindle mounts.

Features:

3 jaw manually operated chuck using the tried and trusted wedge bar mechanism. Integrated quick-change jaws to optimize setup times. Hardened chuck body for greatest precision and lifespan. All interior parts made from high grade steel for maximum clamping forces. The chuck has a large bore diameter for the machining of bars. Base jaw format with helical teeth and metric cross tenon at the jaw locating interface.

Delivery scope:

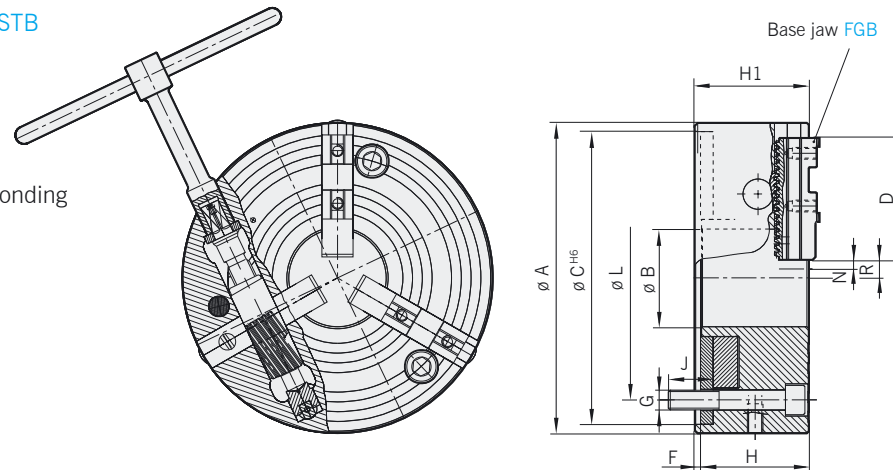
- Manual chuck optionally with base jaws **FGB**
- with base and hardened top jaws **FHB** ground in the chuck under tension
- with one-piece hard stepped jaws **FSTB** ground in the chuck under tension
- Each supplied with a key.

Clamping jaws - see SAV 269.20 from page 24.

For short taper fixing with the corresponding cover plate, see page 21



SAV 260.20



Nominal size	Dimensions in mm												
	A	B ^{+0,1}	C ^{H6}	D	F	G	H	H ₁	J	L	N	R _{min}	R _{max}
125	125	35	115	47	4	3 x M8	46,5	53,1	11	100	4,8	9,2	23,6
160	161	45	145	74	5	3 x M10	63	69	13	125	6,3	12,1	31,5
200	206	55	185	90	5	3 x M12	81,3	88	18	160	6,8	13,2	42,6
250	255	75	235	110	6	3 x M16	92	99	27	200	7,5	14,8	51
315	318	100	300	125	6	3 x M20	111	119	33	250	9,6	18,7	68
400	400	130	380	160	6	3 x M24	118	129	34	315	12	24,7	93,1
500	500	180	460	160	6	3 x M24	119	130	34	235/400	12	41,6	135,7
630	630	270	580	230	6	3 x M24	143	155	34	330,2/520	14,1	33,4	169,8

Nominal size	Max. clamping force F _{sp} max in daN	Max. actuating torque Md max in Nm	n _{max} in 1/min	Mass moment of inertia in kgm ²	Chuck constant C1 in daNm/Nm	Chuck constant C2 in mm	Weight with jaws in kg	Jaw connection
125	3.700	40	6.000	0,0075	6.500	165	3,7	F 125
160	8.000	80	5.200	0,0325	11.100	260	8,6	F 160
200	12.000	120	4.600	0,1025	13.100	320	18,5	F 200
250	17.500	190	4.000	0,2850	31.100	390	32,5	F 250
315	21.500	210	3.200	0,8125	39.100	440	62	F 315
400	23.400	260	2.200	2,2	44.200	570	102	F 400
500	23.400	260	1.500	5,5	44.200	570	159	F 400
630	28.000	315	1.000	17,5	56.200	820	293	F 500

Ordering example:

F+ manual chuck with cylindrical centering mounting
Designation

SAV 260.20 - 630 - FGB
SAV - No. - Nominal size - Jaws

F+ MANUALLY OPERATED CHUCK

With centering plate and adaptor flange for short taper fixing

Chuck with centering plate for bayonet ring fixing according to DIN 55027, ISO 702/III, ASA B 5.9 B

Spindle nose	Size in mm	Nominal size								Chuck flange J
		125	160	200	250	315	400	500	630	
J3	C1	59,5	-	-	-	-	-	-	-	
J4	C1	59,5	75,3	93,3	-	-	-	-	-	
J5	C1	66,5	79,3	95,3	107	-	-	-	-	
J6	C1	-	85,3	97,3	108	128	-	-	-	
J8	C1	-	-	108,3	111	130	138	138	-	
J11	C1	-	-	-	-	133	138	138	165	
J15	C1	-	-	-	-	-	-	145	167	

Stud bolts and collar nuts included in the delivery

Chuck with centering plate for camlock fixing according to DIN 55029, ISO 702/II, ASA B 5.9 D1

Spindle nose	Size in mm	Nominal size								Chuck flange D
		125	160	200	250	315	400	500	630	
D3	C1	66,5	-	-	-	-	-	-	-	
D4	C1	67,5	85,3	99,3	-	-	-	-	-	
D5	C1	-	87,3	101,3	112	-	-	-	-	
D6	C1	-	103,3	106,3	117	146	-	-	-	
D8	C1	-	-	-	122	138	143	143	-	
D11	C1	-	-	-	-	143	148	148	170	
D15	C1	-	-	-	-	-	-	153	175	

Camlock bolts included in the delivery

Chuck with adaptor flange for fixing to the spindle nose according to DIN 55026, ISO 702/I, ASA B 5.9 A1 und A2

Spindle nose	Size in mm	Nominal size								Chuck flange K
		125	160	200	250	315	400	500	630	
K3	C1	64,5	-	-	-	-	-	-	-	
K4	C1	64,5	81,3	110	-	-	-	-	-	
K5	C1	-	81,3	110	110	-	-	-	-	
K6	C1	-	-	112	112	136	-	-	-	
K8	C1	-	-	-	117	136	148	154	-	
K11	C1	-	-	-	-	143	150	154	183	
K15	C1	-	-	-	-	-	-	159	167	

Flanges for other adaptations are available upon request.

Ordering example:

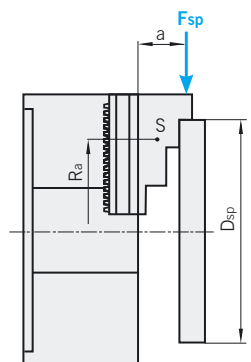
F+ manual chuck with adaptor flange SAV 260.20 - 200 - FGB - K5
Designation SAV - No. - Nominal size - Jaw specification - Spindle nose

The operational clamping force F_{sp} is calculated according to the following formula:

$$F_{sp} = \frac{C1}{C2 + a} \times Md \pm 0,0008 \times \frac{(G \times Ra \times i)}{1000} \times n^2 \quad [daN]$$

Terms used in the formula:

- F_{sp} = Operational clamping force (daN),
The total clamping force of all jaws at the operating speed
+ by internal clamping
- by external clamping
- C1, C2 = Chuck constants
Md = Torque produced using the chuck key (Nm)
n = Rotational speed (min⁻¹)
- a = Jaw projection (mm)
(Chuck front edge to the clamping position)
- G = Weight of a clamping jaw (kg)
(e.g. one-piece stepped jaw FSTB)
- i = Number of jaws
- Ra = Distance of the centre of gravity from the chuck centre (mm)
- Dsp = Clamping diameter (mm)



FNC POWER CHUCKS

With quick-change jaw system

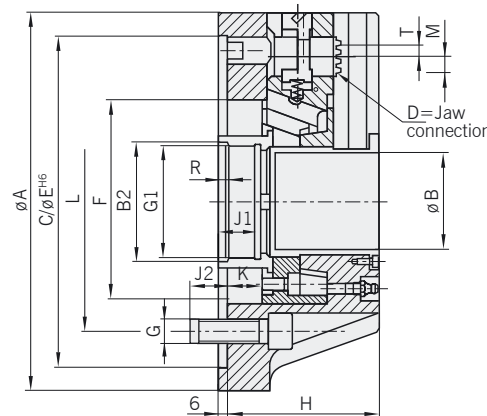
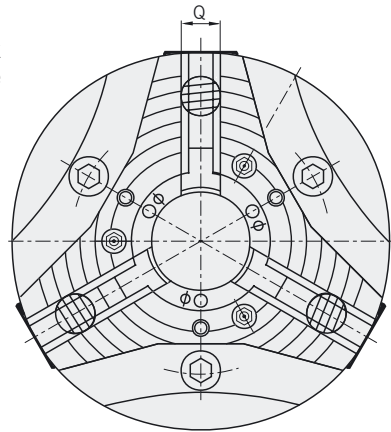
Application:

Power actuated wedge bar chuck in 3 jaw format with a quick-change jaw system. The universal power chuck counts as one of the most efficient and flexible chucks. Frequent jaw changes for small batch or single item production is possible with a minimal setup time and therefore still remains very economical.

Features:

The jaw systems are compatible with the manual chuck F+. Single piece, high strength chuck body despite the weight reduction and its shallow design. High concentric and repeat accuracy levels. High clamping force due to the chuck piston with highly durable Trapezoidal wedge hooks. The FNC power chucks are delivered with the jaws of your choice. Thanks to the quick-change jaw system you can always work using the optimal jaws, without long down-times.

Clamping jaws see SAV 269.20
Short taper fixing with chuck flange or adaptor plate see SAV 260.80 on page 35.



No- minal size	A	B	B2 ^{H7}	C/E ^{H6}	D	F	G	Dimensions in mm												
								G1*	H	J1	J2	K	L	M	Q	R	T			
175	180	42	51	Z5/140	F160	90	M10	M50 x 2	78	22	15	20	104,8	7,2	20	6	4,8			
200	206	45	53	Z6/170	F200	106	M12	M52 x 2	83	22	18	20	133,4	7,2	22	6	4,8			
250	257	72	81	Z8/220	F250	140	M16	M80 x 2	100	28	24	23	171,4	8,3	26	6	6,0			
315	315	82	94	Z11/300	F250	150	M20	M92 x 2	100	28	30	23	235,0	8,3	26	6	6,0			
400	400	92	102	Z11/300	F315	192	M20	M100 x 2	127	28	30	28	235,0	10,0	32	6	7,0			
500	500	125	136	Z15/380	F400	230	M24	M135 x 2	138	28	36	33	330,2	12,0	45	6	8,5			
630	630	125	136	Z15/380	F400	230	M24	M135 x 2	138	28	36	33	330,2	12,0	45	6	8,5			

* For universal mounting, the rotatable, threaded bush in the chuck piston can be exchanged and operated with any connector.

No- minal size	Max. clamping force F _{sp} max in daN	Max. actuating torque F _{max} in daN	Chuck constant C1 in mm	Chuck constant C2 in mm	Chuck constant C3 in kgm	n _{max} in 1/min	Mass moment of inertia in kgm ²	Max. projection top jaw in mm	Max. Weight top jaw in kg/Stck.	Weight in kg
175	5.500	3.000	390	213	0,065	7.000	0,04	40	0,22	11
200	8.400	4.500	412	221	0,09	6.300	0,09	45	0,34	15
250	12.000	6.000	580	290	0,187	4.500	0,20	58	0,74	24
315	12.000	6.000	780	390	0,33	4.000	0,50	58	0,74	37
400	19.500	10.000	940	482	0,73	3.300	1,50	65	2,24	68
500	24.000	12.000	1200	600	1,66	2.200	4,00	85	3,60	115
630	24.000	12.000	1760	880	2,80	1.700	11,00	85	3,60	200

Ordering example:

FNC-Power chuck SAV 260.30 - 400 - FSTB - Sch

Designation SAV - No. - Nominal size - Jaw specification - Grinding format

For orders with base jaws and hardened top jaws FHB and/or one-piece hardened stepped jaws FSTB according to SAV 269.20, it is possible to grind the jaws under clamping force in the chuck. The order number must be supplemented with "Sch".

SAV 260.30

FNC POWER CHUCKS

Jaw formats / Overview

The chucks will be delivered with your choice of jaws.



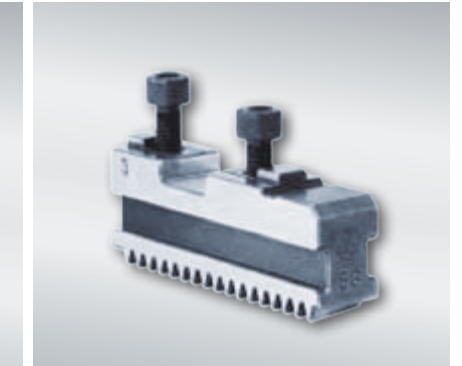
Stepped jaw, hard, one-piece – FSTB

- Hardened, one-piece clamping jaw for universal use
- The jaws can subsequently be ground in the chuck.
- Increased clamping force due to the serrated teeth / block teeth



Jaw unit, hard – FGB / FHB

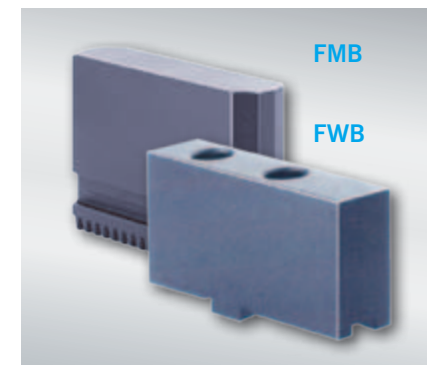
- Quick changing of the jaws is possible, without the need to separate the top jaws from the base jaws.



Base jaws – FGB

- Bearer jaws for the top jaws
- Precisely ground for maximum repeat accuracy

For orders of the chuck FNC with FSTB or FGB/FHB it is possible to grind the jaws under clamping force in the chuck. The order number must be supplemented with "Sch".



Monoblock jaw FMB

Top jaw FWB

- Soft jaws of type FMB/FWB are available for the accurate clamping of previously machined workpieces, which must not be damaged by the clamping surface.
- Under clamping pressure, these jaws are tightened by the user to the respective clamping diameter to ensure extremely high repeat accuracy.

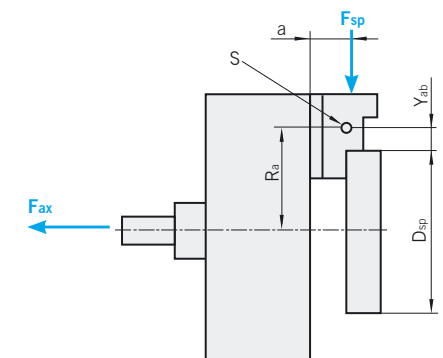
The operational clamping force F_{sp} is calculated according to the following formula:

$$F_{sp} = \frac{C1}{C2 + a} \times F_{ax} \pm 0,0008 \times (C3 + Ma) \times n^2 \quad [daN]$$

Terms used in the formula:

- F_{sp} = Operational clamping force [daN], The total clamping force of all jaws during operation
- C1, C2, C3 = Chuck constants
- F_{ax} = Operating force (daN)
- n = Rotational speed (min⁻¹)
- Ma = Total centrifugal moment of the clamping jaws (kgm)
- D_{sp} = Clamping diameter (mm)

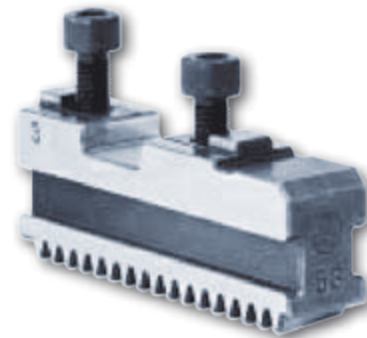
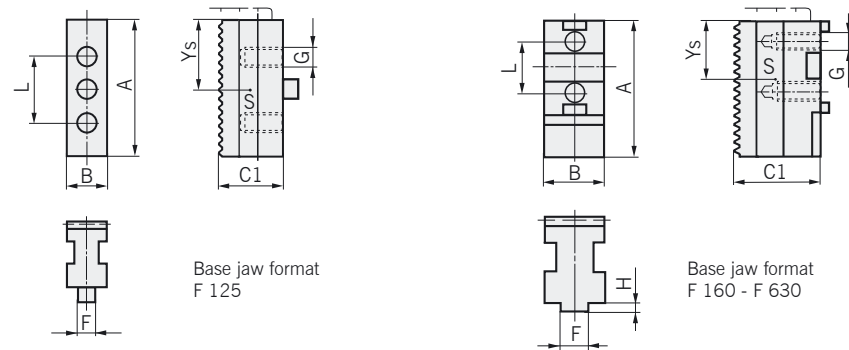
- Y_{ab} = Distance of the centre of gravity of the top jaw from the clamping diameter
- a = Jaw projection (mm)
- G = Weight of a clamping jaw (kg) (e.g. one-piece stepped jaw FSTB)
- i = Number of jaws
- R_a = Distance of the centre of gravity of the top jaw from the chuck centre (mm)
- ± = Internal and external clamping



BASE JAWS – FGB

SAV 269.20

For power chuck FNC and manual chuck F+, SAV 260.30 and 260.20



Chuck	Type	A	B	B1	Dimensions in mm					Weight in kg/piece
					C1	F	G	L	y _s	
F+125	FGB 125	47	14	-	19,5	5	M6	20	23,5	0,08
F+160 FNC 175	FGB 160	74	20	8	27	18	M8 x 1	32	36	0,22
F+200 FNC 200	FGB 200	90	22	10	32	20	M8 x 1	40	45,5	0,37
F+250 FNC 250	FGB 250	110	26	12	37	20	M12x1,5	40	58,5	0,59
F+250 FNC 315	FGB 250	110	26	12	37	20	M12x1,5	40	58,5	0,59
F+315 FNC 400	FGB 315	125	32	12	43	26	M12x1,5	54	63,5	0,95
F+400 FNC 500	FGB 400	160	45	18	51	30	M16x1,5	60	81,5	2,10
F+500 FNC 630	FGB 400	160	45	18	51	30	M16x1,5	60	81,5	2,10
F+630	FGB 630	230	65	24	58	40	M20	82	117	5,45

Ordering example:

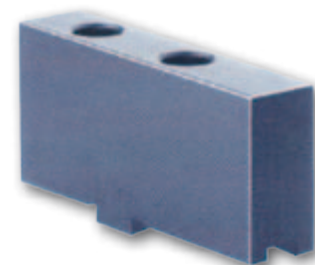
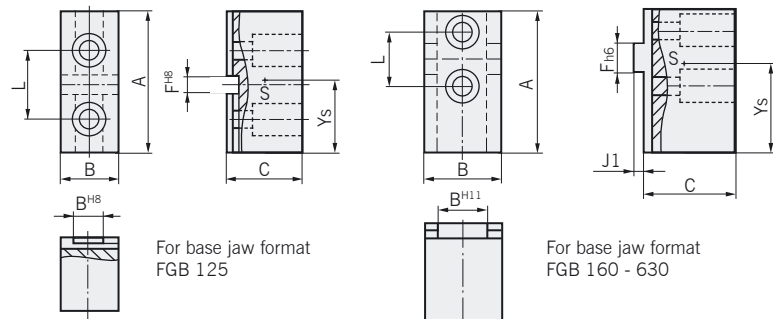
Base jaw SAV 269.20 - FGB 250

Designation SAV - No. - Type

TOP JAWS, SOFT – FWB

SAV 269.20

For power chuck FNC and manual chuck F+, SAV 260.30 and 260.20



Chuck	Type	A	B	C	Dimensions in mm					Weight in kg/piece
					B1	F	J ₁	L	y _s	
F+125	FWB 125	55	20	27,5	14	5	3,5	20	27,5	0,20
F+160 FNC 175	FWB 160	85	20	35,5	8	18	4,5	32	43	0,40
F+200 FNC 200	FWB 200	105	22	42	10	20	5	40	53	0,65
F+250 FNC 250	FWB 250	125	32	50	12	20	5	40	63,2	1,34
F+250 FNC 315	FWB 250	125	32	50	12	20	5	40	63,2	1,34
F+315 FNC 400	FWB 315	145	36	56	12	26	6	54	73,7	2,04
F+400 FNC 500	FWB 400	180	45	75	18	30	7	60	86,7	4,16
F+500 FNC 630	FWB 400	180	45	75	18	30	7	60	86,7	4,16
F+630	FWB 630	260	65	110	24	40	8	82	123	13,24

Ordering example:

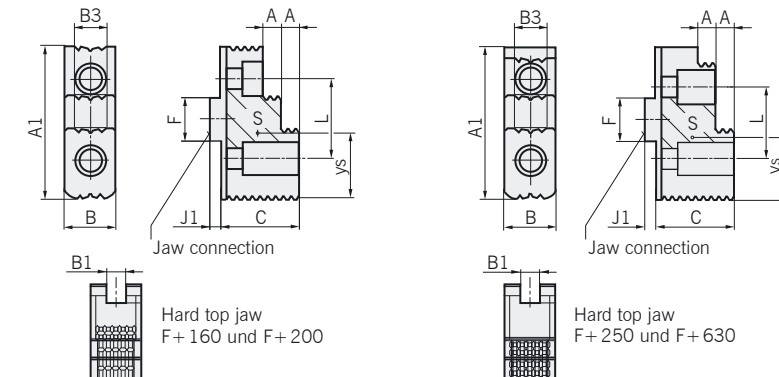
Top jaw, soft SAV 269.20 - FWB 250

Designation SAV - No. - Type

TOP JAWS, HARD – FHB

SAV 269.20

For power chuck FNC and manual chuck F+, SAV 260.30 and 260.20

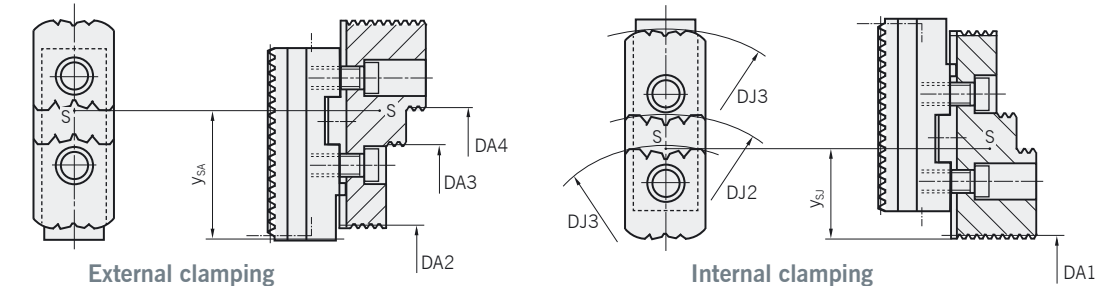


Chuck	Type	A	B	C	A1	B1 ^{H11}	F _{H6}	J1	L	y _s	Weight in kg/piece
F+160 FNC 175	FHB 160	7,5	20	32,5	63	8	18	4,5	32	36	0,22
F+200 FNC 200	FHB 200	10	22	38	72	10	20	5	40	45,5	0,37
F+250 FNC 250	FHB 250	14	32	50	90	12	20	5	40	58,5	0,59
F+250 FNC 315	FHB 250	14	32	50	90	12	20	5	40	58,5	0,59
F+315 FNC 400	FHB 315	15	36	56	104	12	26	6	54	63,5	0,95
F+400 FNC 500	FHB 400	20	45	75	130	18	30	7	60	81,5	2,10
F+500 FNC 630	FHB 400	20	45	75	130	18	30	7	60	81,5	2,10
F+630	FHB 630	30	65	97	185	24	40	8	82	117	5,45

CLAMPING RANGES

In power chuck FNC and manual chuck F+, SAV 260.30 and 260.20

TOP JAWS, HARD – FHB



Chuck	Type	External clamping				Internal clamping			y _{sA}	y _{sJ}	max. swing diameter
		DA1	DA2	DA3	DA4	DJ1	DJ2	DJ3			
F+160	FHB 160	05-52	46-96	86-136	112-162	65-112	90-136	131-179	45,0	33,9	224
FNC 175	FHB 160	16-65	59-108	99-149	125-175	76-125	100-151	142-192	45,1	33,9	234
F+200	FHB 200	07-76	39-110	93-164	121-192	70-139	90-167	151-221	53,7	40,3	270
FNC 200	FHB 200	16-76	69-120	122-202	150-210	79-130	107-166	160-220	53,7	40,3	273
F+250	FHB 250	07-92	-	87-172	167-252	89-172	160-252	-	66,5	48,5	335
FNC 250	FHB 250	16-101	-	96-182	176-262	98-182	177-262	-	66,3	48,5	335
F+315	FHB 315	13-126	-	96-211	212-321	89-200	198-310	-	74,7	55,3	400
FNC 315	FHB 250	16-137	-	96-218	176-298	90-218	177-298	-	66,3	48,5	378
F+400	FHB 400	17-125	-	136-293	258-416	122-278	243-400	-	95,7	69,3	525
FNC 400	FHB 315	34-202	-	120-275	230-386	109-279	219-388	-	74,7	55,3	462
F+500	FHB 400	48-259	-	169-379	291-500	154-362	276-485	-	95,7	69,3	608
FNC 500	FHB 400	46-236	-	147-359	209-401	152-341	274-464	-	95,7	69,3	586
FNC 630	FHB 400	46-339	-	147-461	209-503	152-443	274-566	-	95,7	69,3	686
F+630	FHB 630	25-323	-	197-405	357-655	190-406	349-647	-	136,3	103,7	823

Ordering example:

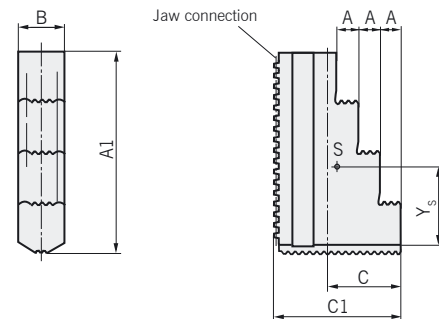
Top jaw, hard SAV 269.20 - FHB 200

Designation SAV - No. - Type

STEPPED JAWS, HARD, ONE-PIECE – FSTB

SAV 269.20

For power chuck FNC and manual chuck F+, SAV 260.30 and 260.20

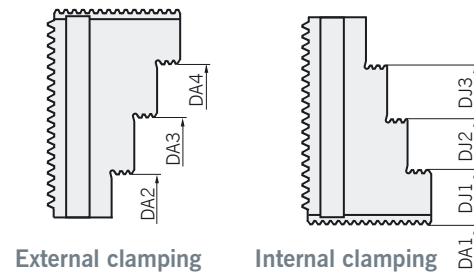


Chuck		Type	Dimensions in mm						Weight in kg/piece
			A	B	C	A1	C1	y _s	
F+125	–	FSTB 125	5	14	18	50	33,5	23,5	0,12
F+160	FNC 175	FSTB 160	7,5	20	24	79	45	35,5	0,35
F+200	FNC 200	FSTB 200	10	22	35	94	60	41	0,62
F+250	FNC 250	FSTB 250	14	26	40	115	70	53	1,09
	FNC 315	FSTB 250	14	26	40	115	70	53	1,09
F+315	FNC 400	FSTB 315	15	32	46	129	81	59	1,77
F+400	FNC 500	FSTB 400	20	45	52	167	93	75,5	3,60
F+500	FNC 630	FSTB 400	20	45	52	167	93	75,5	3,60

CLAMPING RANGES

In power chuck FNC and manual chuck F+, SAV 260.30 and 260.20

STEPPED JAWS, HARD, ONE-PIECE – FSTB



Chuck	Type	External clamping				Internal clamping			max. swing diameter
		DA ₁	DA ₂	DA ₃	DA ₄	DJ ₁	DJ ₂	DJ ₃	
F+125	FSTB 125	03-41	26-62	58-94	90-126	27-64	58-96	90-128	148
F+160	FSTB 160	05-53	45-94	84-133	125-173	54-101	93-141	133-180	224
FNC 175	FSTB 160	20-66	53-99	93-138	133-178	67-112	107-152	146-192	228
F+200	FSTB 200	05-66	57-117	105-166	153-213	56-116	103-163	152-212	268
FNC 200	FSTB 200	15-72	68-116	116-164	164-211	65-121	112-169	160-217	264
F+250	FSTB 250	20-102	99-180	-	179-261	100-182	-	180-262	346
FNC 250	FSTB 250	20-102	99-180	-	179-261	100-182	-	180-262	346
F+315	FSTB 315	13-126	96-212	-	206-322	89-200	-	198-310	402
FNC 315	FSTB 250	34-174	106-248	-	216-358	109-358	-	218-360	405
F+400	FSTB 315	17-174	136-277	-	257-399	124-278	-	245-400	512
FNC 400	FSTB 315	30-140	103-214	-	231-324	105-216	-	215-326	405
F+500	FSTB 400	34-182	152-286	-	274-408	137-288	-	258-410	522
FNC 500	FSTB 400	48-259	170-378	-	291-501	153-362	-	273-485	610
FNC 630	FSTB 400	34-302	152-422	-	274-546	137-407	-	258-530	656

Ordering example:

Stepped jaw, hard, one-piece SAV 269.20 - FSTB 250
Designation SAV - No. - Type

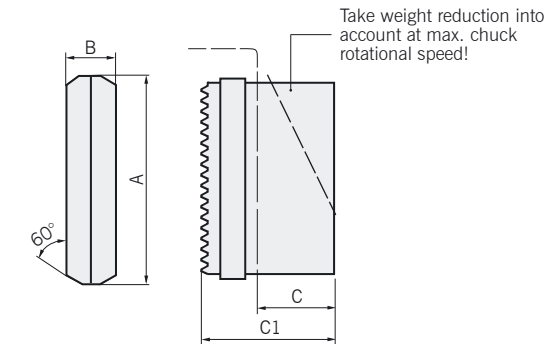
MONOBLOCK JAWS, SOFT – FMB

SAV 269.20

For power chuck FNC and manual chuck F+, SAV 260.30 and 260.20

Application:

High level of jaw utilisation as no fixing bolts are required.
A lower weight than FGB+FVB jaw units.
More precise clamping of the workpiece on the chuck.



Chuck		Type	Dimensions in mm				Weight in kg/piece
			A	B	C	C1	
F+160	FNC 175	FMB 160	79	20	24	45	0,27
F+200	FNC 200	FMB 200	94	22	36	60	0,84
F+250	FNC 250	FMB 250	115	26	40	70	1,41
	FNC 315	FMB 250	115	26	40	70	1,41
F+315	FNC 400	FMB 315	130	32	46	81	2,21
F+400	FNC 500	FMB 400	176	45	53	93	5,15
F+500	FNC 630	FMB 400	176	45	52	93	5,15

Ordering example:

Monoblock jaw, soft SAV 269.20 - FMB 250
Designation SAV - No. - Type

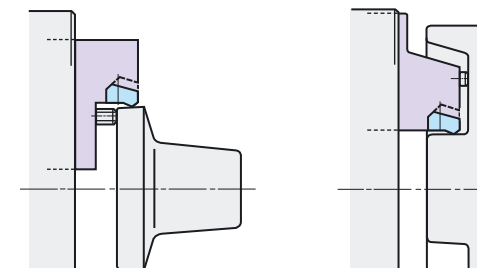
ROUGHING JAWS KBKTNC

SAV 269.20

For power chuck FNC and manual chuck F+, SAV 260.30 and 260.20

Application:

For the heavy duty roughing work/machining of overhanging workpieces, the roughing jaws Type KBKTNC with replaceable chuck claws SKA (for external clamping) and SKI (for internal clamping) are available.



Roughing jaw KBKTNC



Chuck claw SKA/SKI



Available upon request

KT POWER CHUCK

In 2, 3 and 4-jaw formats

Application:

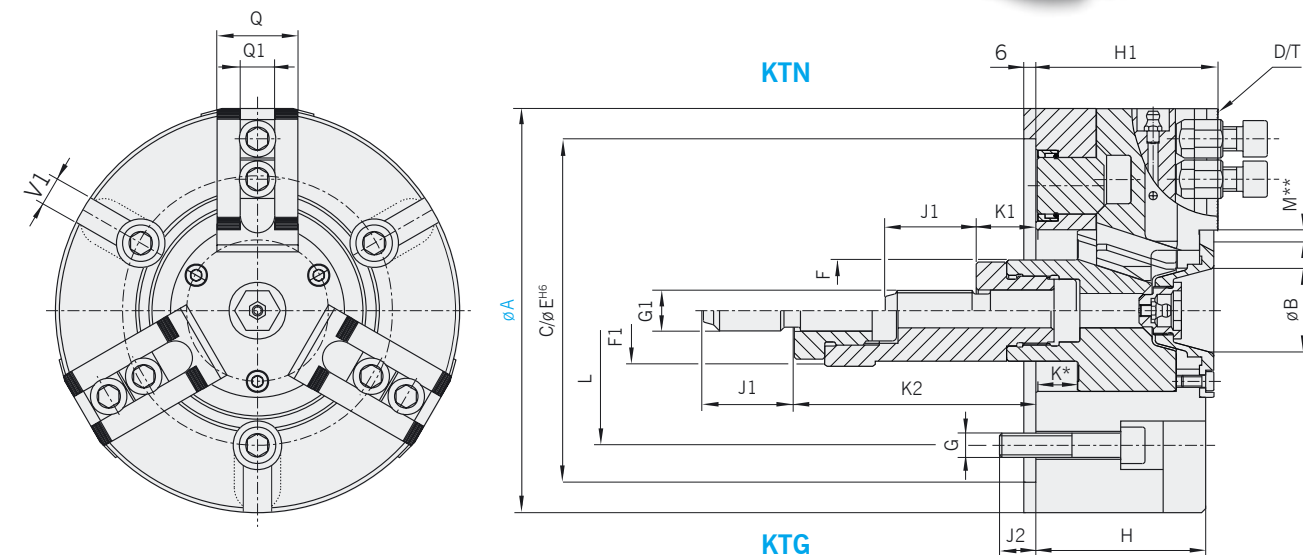
The unique wedge hook profile provides an enormous clamping pressure and makes possible heavy-duty milling operations with a consistently high clamping accuracy level.

Features:

Integrated T-slots in the chuck body for the mounting of workpiece stops. Base jaws with serrations. (Cross tenon or other toothing formats available upon request.) Higher resilience than standard wedge hook chucks due to the special wedge hook geometry. A choice of chuck variants: **KTN** with standard piston or **KTG** with extended and guided piston for maximum repeat accuracy.



SAV 260.31



Dimensions in mm																					
A	B	C	D	øE ^{H6}	F	F1	G	G1	H	H1	J1	J2	K*	K1	K2	L	M**	Q	Q1	T	V1
160	35	Z5	S11	140	35	40	M12	M16	74	80	40	15	20	25	70	104,8	5,3	40	17	1/16" x 90°	-
200	42	Z6	S11	170	50	55	M12	M20	84	90	45	18	20	30	75	133,4	6,5	40	17	1/16" x 90°	14
250	50	Z8	S12	220	52	65	M16	M24	97	105	55	24	26	30	75	171,4	8,0	50	21	1/16" x 90°	18
315	50	Z8	S12	220	52	65	M16	M24	97	105	55	24	26	30	75	171,4	8,0	50	21	1/16" x 90°	18
400	-	Z11	S23	300	68	85	M20	M30	120	130	55	30	32	30	100	235,0	10,0	60	25,5	3/32" x 90°	22
500	-	Z15	S23	380	68	85	M24	M30	120	130	55	36	32	30	100	330,2	10,0	60	25,5	3/32" x 90°	22
630	-	Z15	S23	380	68	85	M24	M30	120	130	55	36	32	30	100	330,2	10,0	60	25,5	3/32" x 90°	22

*K = Piston stroke **M = Jaw stroke

Spindle adaption see SAV 260.80
Clamping jaws see SAV 269.30

For orders with hardened top jaws **HB** and/or clawed jaws **UKB** it is possible to grind the jaws under clamping force in the chuck.

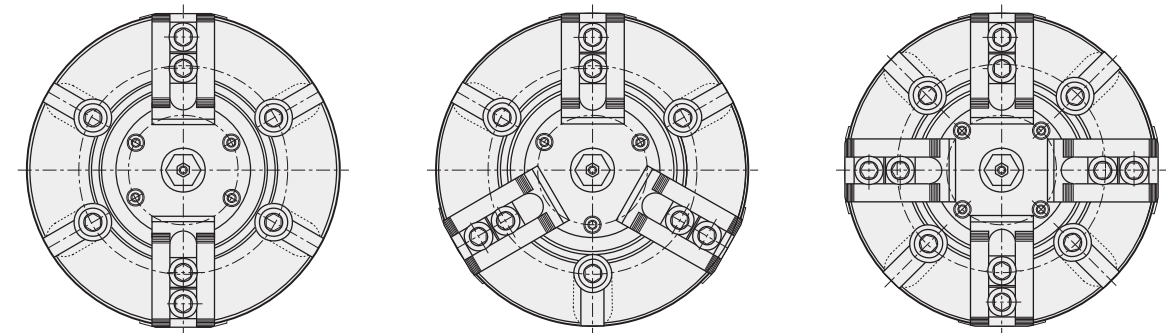
The order number must be supplemented with "Sch".

Ordering example:

KT - Power chuck SAV 260.31 - 250 - 3 - KTN - HB - Sch
Designation SAV-No. - A - Number of jaws - Build type - Jaw specification - Grinding format

KT POWER CHUCK

SAV 260.31



Performance data for power chucks KTN / KTG

Chuck type 2KTN / 2KTG / 2 jaws									
A		mm	160	200	250	315	400	500	630
Max. actuating torque	F _{max}	daN	2.400	3.200	4.700	5.300	8.000	12.000	12.000
Max. clamping force	F _{sp} _{max}	daN	4.600	6.000	9.400	10.600	17.300	27.000	27.000
Max. rotational speed	n _{max}	U / min	4.500	4.200	3.300	2.800	2.200	2.000	1.600
Weight	G	kg	10	19	34	56	120	180	285
Mass moment of inertia	J	kgm ²	0,035	0,10	0,28	0,70	2,40	5,70	14,80
Chuck constant	C1	mm	516	634	909	1075	1777	2547	3130
Chuck constant	C2	mm	235	308	424	508	790	1101	1361
Chuck constant	C3	kgm	0,09	0,13	0,26	0,45	1,2	1,9	3,1

Chuck type 3KTN / 3KTG / 3 jaws									
A		mm	160	200	250	315	400	500	630
Max. actuating torque	F _{max}	daN	3.600	4.800	7.000	8.000	12.000	16.000	16.000
Max. clamping force	F _{sp} _{max}	daN	7.000	9.000	14.000	16.000	26.000	36.000	36.000
Max. rotational speed	n _{max}	U / min	4.500	4.200	3.300	2.800	2.200	2.000	1.600
Weight	G	kg	10	19	34	56	120	180	285
Mass moment of inertia	J	kgm ²	0,035	0,10	0,28	0,70	2,40	5,70	14,80
Chuck constant	C1	mm	516	634	909	1075	1777	2547	3130
Chuck constant	C2	mm	235	308	424	508	790	1101	1361
Chuck constant	C3	kgm	0,13	0,2	0,4	0,67	1,8	2,8	4,7

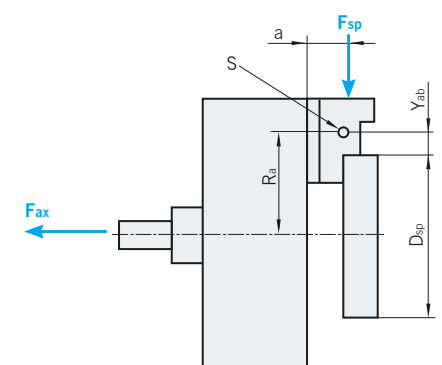
Chuck type 4KTN / 4KTG / 4 jaws									
A		mm	-	200	250	315	400	500	630
Max. actuating torque	F _{max}	daN	-	4.800	7.000	8.000	12.000	16.000	16.000
Max. clamping force	F _{sp} _{max}	daN	-	9.000	14.000	16.000	26.000	36.000	36.000
Max. rotational speed	n _{max}	U / min	-	3.800	3.000	2.500	2.000	1.800	1.400
Weight	G	kg	-	19	34	56	120	180	285
Mass moment of inertia	J	kgm ²	-	0,10	0,28	0,70	2,40	5,70	14,80
Chuck constant	C1	mm	-	634	909	1075	1777	2547	3130
Chuck constant	C2	mm	-	308	424	508	790	1101	1361
Chuck constant	C3	kgm	-	0,26	0,53	0,9	2,4	3,7	6,2

The operational clamping force F_{sp} is calculated according to the following formula:

$$F_{sp} = \frac{C1}{C2 + a} \times F_{ax} \pm 0,0008 \times (C3 + Ma) \times n^2 \quad [daN]$$

Terms used in the formula:

F _{sp}	= Operational clamping force [daN], The total clamping force of all jaws during operation	D _{sp}	= Clamping diameter (mm)
C1, C2, C3	= Chuck constants	Y _{ab}	= Distance of the centre of gravity of the top jaw from the clamping diameter
F _{ax}	= Operating force (daN)	a	= Jaw projection (mm)
n	= Rotational speed (min ⁻¹)	G	= Weight of a clamping jaw (kg)
Ma	= Total centrifugal moment of the clamping jaws (kgm) = $\sum G \times Ra$	i	= Number of jaws
		R _a	= Distance of the centre of gravity of the top jaw from the chuck centre (mm)
		±	= Internal and external clamping



QLC POWER CHUCK

With centrifugal force compensation

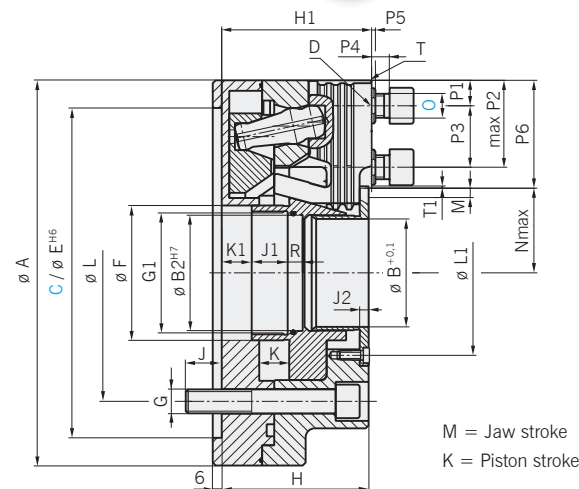
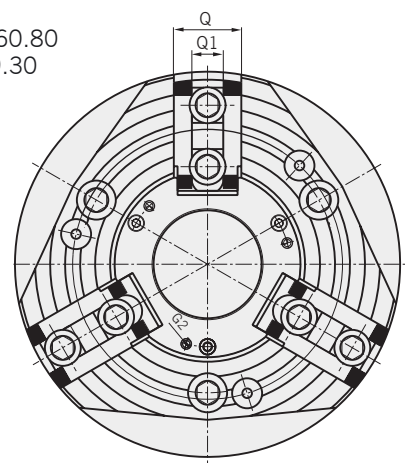
Application:

The power chuck QLC is suitable as a universal chuck for almost all machining operations.

Features:

Power chucks are highly efficient, high productivity wedge hook chucks with a large open centre bore. With centrifugal force compensation and integrated lubricant reservoir. An optimal transmission of the clamping forces due to the patented multiple jaw guides. Play-free wedge hook mechanism for maximum clamping force and repeat accuracy. Base jaw profile with an optimal guide length for internal and external clamping. Improved chuck seal. No undercuts and therefore a very low level of lubricant loss. Long maintenance intervals. Easily mounted, piston installed flush in the chuck, axial stroke limitation in the chuck.

Spindle adaption see SAV 260.80
Clamping jaws see SAV 269.30



M = Jaw stroke
K = Piston stroke

No-nominal size	Dimensions in mm																		
	A	B ^{+0,1}	B2 ^{H7}	C	D	E ^{H6}	F	G	G1	H	H1	J	J1	J2	K	K1	L	M	N _{max}
160	162	38	42	Z5	S11	140	52	M10x95	M45x2	90	92	19	18	5	17	17	104,8	4,5	33
200	210	54	65	Z6	S11	170	76	M12x90	M68x2	90	92	20	18	5	20	20	133,4	5,4	44,5
250	257	72	77	Z8	S12	220	90	M16x100	M82x2	98	100	19	24	6	20	20	171,4	5,4	56,5
315	320	88	93	Z8	S12	220	110	M16x100	M100x2	98	100	21	24	6	20	20	171,4	5,4	61
315	320	88	93	Z11	S12	300	110	M20x80	M100x2	98	100	25	24	6	20	20	235	5,4	61
400	400	126	134	Z11	S12	300	150	M20x130	M140x2	128	130	24	26	8	30	30	235	8	85
400	400	126	134	Z15	S12	380	150	M24x110	M140x2	128	130	25	26	8	30	30	330	8	85
400	400	126	134	Z11	S23	300	150	M20x130	M140x2	128	130	24	26	8	30	30	235	8	85
400	400	126	134	Z15	S23	380	150	M24x110	M140x2	128	130	25	26	8	30	30	330	8	85

No- minal size	Dimensions in mm												
	P1 _{min}	P1 _{max}	P2 _{min}	P2 _{max}	P3	P4	P5	P6	Q	Q1 ^{H7}	R	T	T1
160	6	17,5	25	36,5	19	10	2,5	48	35	12	6,6	1/16" x 90°	1,5
200	6	27,5	25	46,5	19	10	2,5	60,5	35	14	6	1/16" x 90°	1,5
250	8	34	32	58	25	10	2,5	72	45	16	10	1/16" x 90°	1,5
315	8	58	32	82	25	10	2,5	99	45	21	10	1/16" x 90°	1,5
315	8	58	32	82	25	10	2,5	99	45	21	10	1/16" x 90°	1,5
400	12	70,5	37	95,5	25	10	2,5	115	60	21	13	1/16" x 90°	1,5
400	12	70,5	37	95,5	25	10	2,5	115	60	21	13	1/16" x 90°	1,5
400	15	60	46	91	31	15	3,5	115	60	21	13	3/32" x 90°	2,5
400	15	60	46	91	31	15	3,5	115	60	21	13	3/32" x 90°	2,5

Ordering example:

QLC – Power chuck SAV 260.32 - 200 - Z6 - M12 - HB - Sch
Designation SAV - No. - Nominal size - C - O - Jaw specification - Grinding format



SAV 260.32



QLC POWER CHUCK

With centrifugal force compensation

Performance data for power chuck QLC

Nenngröße		mm	160	200	250	315	400-M16	400-M20
Max. actuating torque	F _{max}	daN	2500	4000	6000	6000	6000	9000
Max. clamping force	F _{sp}	daN	6000	10000	15000	16000	14000	23000
Max. rotational speed QLC	n _{max}	1 / min	8000	6300	4500	4000	3200	3200
Max. rotational speed QLK	n _{max}	1 / min	6300	5000	4000	3500	2500	2500
Max. weight top jaw	**	kg / piece	0,4	0,5	1,12	1,12	2,52	2,52
Max. projection top jaw	**	mm	40	45	55	55	70	70
Weight	G	kg	11,5	18	26	38	90	90
Mass moment of inertia	J	kgm ²	0,055	0,2	0,65	0,65	2,1	2,1
Chuck constant	C1	mm	507	808	916	1186	1309	1309
Chuck constant	C2	mm	227	322	398	497	553	553
Chuck constant	C3	kgm	0,07	0,11	0,2	0,35	1	1
Chuck constant	C4	daNmin ²	0,00008	0,00019	0,00032	0,0006	0,0015	0,0015

Standard format without clamping jaws.
Optionally available with hard top jaws „HB“ and clawed jaws „UBK“.

For orders with hardened top jaws „HB“ and/or clawed jaws „UBK“ it is possible to grind the jaws under clamping force in the chuck. The order number must be supplemented with „Sch“.

The appropriate thread adaptor can be ordered upon request to enable connections to the power chuck. Please supply the spindle specification and installation plans.

Other chuck formats are available upon request:

- with larger bore QLC - KS
- with longer jaw stroke QLC - LS
- with jaw compensation and centering point for shaft machining QLC - AS
- without centrifugal force compensation QLK
- without chuck bore QLC – KT

Chucks with other jaw location connections such as metric serrations, cross tenon or quick-change systems are available upon request.

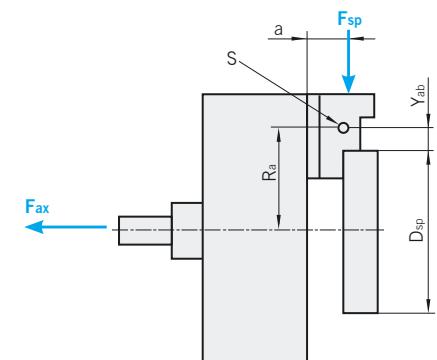
Some special format chucks can be supplied with 2 or 4 jaws.

The operational clamping force F_{sp} is calculated according to the following formula:

$$F_{sp} = \frac{C1}{C2 + a} \times Fax \pm 0,0008 \times (C3 + Ma) \times n^2 \pm C4 \times n^2 \text{ [daN]}$$

Terms used in the formula:

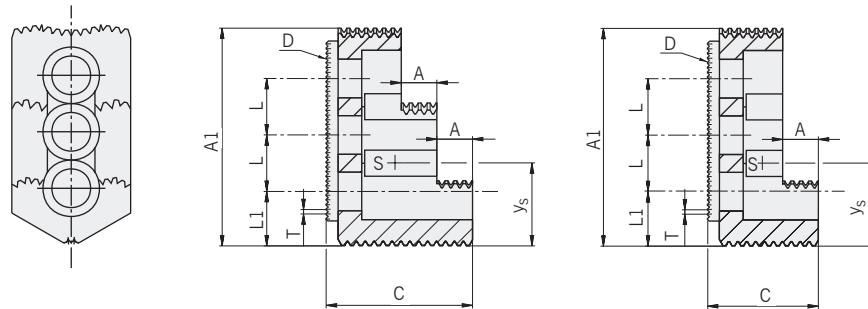
- | | | | |
|-----------------|---|-----|---|
| F _{sp} | = Operational clamping force [daN], The total clamping force of all jaws during operation | Yab | = Distance of the centre of gravity of the top jaw from the clamping diameter |
| C1, C2, C3 | = Chuck constants | a | = Jaw projection (mm) |
| Fax | = Operating force (daN) | G | = Weight of a clamping jaw (kg) (e.g. one-piece stepped jaw FSTB) |
| n | = Rotational speed (min ⁻¹) | i | = Number of jaws |
| Ma | = Total centrifugal moment of the clamping jaws (kgm) | Ra | = Distance of the centre of gravity of the top jaw from the chuck centre (mm) |
| | = $\sum G \times Ra$ | ± | = Internal and external clamping |



TOP JAWS, HARD – HB

For power chucks KT and QLC, SAV 260.31 and 260.32

HB 23/140

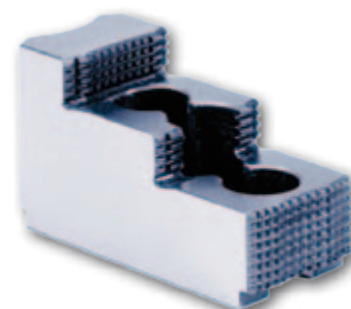
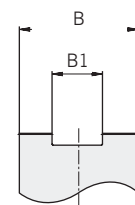


Type	A	B	C	D	A1	B1	L	L1	y _s	T	Weight in kg/piece
HB11/65	10	35	44	S11	64,7	17	19	28	27,5	1/16" x 90°	0,39
HB11*	12	40	49	S11	72,6	17	19	18	32,5	1/16" x 90°	0,47
HB11/110	12	40	49	S11	80,8	17	19	26,2	34,0	1/16" x 90°	0,56
HB12*	14	50	58	S12	103,5	21	25	33,5	42,5	1/16" x 90°	1,12
HB23/18*	18	60	75	S23	139,7	25,5	31	53	56,5	3/32" x 90°	2,52
HB23/140	26	60	65	S23	139,7	25,5	31	53	57,5	3/32" x 90°	2,15

* Standard

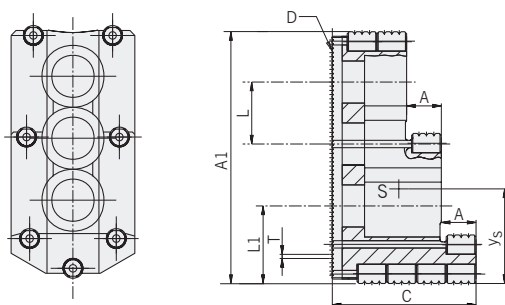
Ordering example:

Top jaw, hard SAV 269.30 - HB11
Designation SAV - No. - Type



CLAW JAWS, HARD – UKB

For power chucks KT and QLC, SAV 260.31 and 260.32

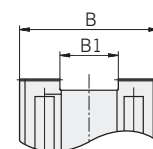
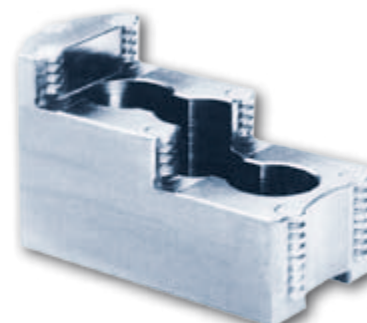


Type	A	B	C	D	A1	B1	L	L1	y _s	T	Weight in kg/piece
UKB11	12	40	49	S11	72,3	17	19	20	32,5	1/16" x 90°	0,47
UKB12	14	50	58	S12	102,0	21	25	31,5	42,5	1/16" x 90°	1,12
UKB23	18	60	75	S23	134,0	25,5	31	51,5	56,5	3/32" x 90°	2,52
UKB23/140	26	60	65	S23	135,0	25,5	31	51,5	57,5	3/32" x 90°	2,15

Ordering example:

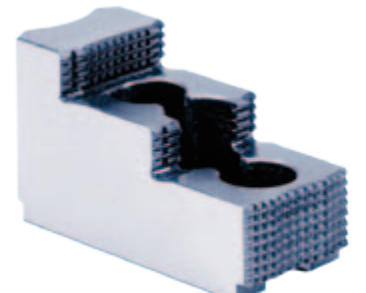
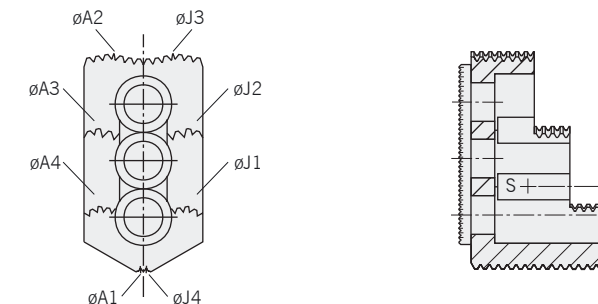
Top jaw, hard SAV 269.30 - UKB11
Designation SAV - No. - Type

SAV 269.30



CLAMPING RANGES

For power chucks KT and QLC, SAV 260.31 and 260.32



Clamping ranges QLC-chucks SAV 260.32 with top jaws SAV 269.30

Chuck-ø	Type	External clamping				Internal clamping				max. swing diameter
		A1	A2	A3	A4	J1	J2	J3	J4	
160	HB11/65	22-56	47-81	92-125	135-170	65-97	108-141	153-187	172-206	207
200	HB11	32-122	38-126	89-188	140-230	80-168	130-219	179-268	180-270	271
250	HB12	24-120	49-155	131-238	212-361	75-165	147-246	255-326	253-313	362
315	HB 12	38-182	64-217	146-300	227-381	80-226	155-308	234-388	268-423	424
400	HB 12	90-256	109-291	191-373	273-455	120-300	199-381	279-462	314-497	498
400	HB23/18	41-208	89-262	193-365	294-467	115-281	213-322	312-484	369-541	542

Clamping ranges QLC-chucks SAV 260.32 with claw jaws SAV 269.30

Chuck-ø	Type	External clamping				Internal clamping				max. swing diameter
		A1	A2	A3	A4	J1	J2	J3	J4	
160	UKB11	126-147	-	58-82	6-35	-	108-130	155-179	165-189	227
		154-185	109-132	39-73	81-115	134-168	183-217	196-227	196-227	
175	UKB11	126-159	-	59-95	9-47	80-89	108-142	155-192	166-201	240
		162-197	109-144	47-85	89-127	142-180	192-230	204-239	204-239	
200	UKB11	143-195	109-142	58-92	28-80	80-122	123-175	173-225	185-237	287
		181-233	128-180	78-131	66-118	108-160	161-213	211-263	223-275	
250	UKB12	200-263	169-181	90-99	13-76	-	139-197	221-279	244-301	353
		250-313	169-231	90-149	64-127	125-166	190-248	272-330	293-350	
315	UKB12	220-326	169-244	90-162	33-142	125-181	154-263	236-345	259-365	416
		268-377	185-294	130-212	84-190	125-229	205-311	287-393	306-416	
400	UKB12	266-399	184-317	102-235	79-212	125-251	200-333	282-415	305-438	490
		316-450	234-368	152-286	130-263	169-302	251-384	333-466	356-489	
400	UKB23	302-415	299-313	195-211	36-149	149-212	201-314	303-416	365-478	537
		364-477	299-375	195-273	98-211	161-274	263-376	365-478	427-540	
400	UKB23/140	304-411	195-204	36-142	-	149-205	305-412	368-474	-	537
		366-473	195-266	95-204	-	161-267	367-474	430-536	-	

Clamping ranges KT-chucks SAV 260.31 with top jaws SAV 269.30

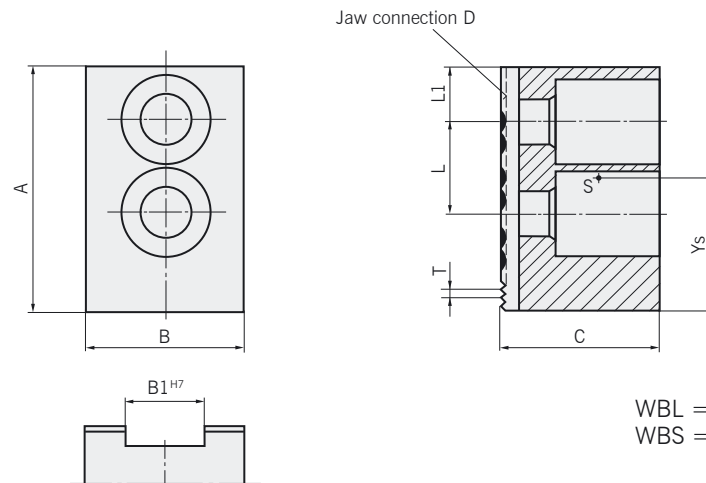
Chuck-ø	Type	External clamping				Internal clamping				max. swing diameter
		A1	A2	A3	A4	J1	J2	J3	J4	
160	HB11	6-68	24-74	74-125	125-176	57-114	105-165	152-214	215	
200		20-98	30-102	77-152	128-202	70-144	118-195	168-243	255	
200*		25-102	46-106	98-156	149-206	75-148	124-200	172-248	261	
250		20-105	33-130	116-212	197-290	74-150	148-230	227-310	344	
250*	HB12	42-116	55-140	138-223	218-305	92-162	168-242	248-322	352	
315		20-170	33-195	116-275	197-359	74-215	148-295	227-375	408	
315*		42-180	55-205	138-286	218-373	92-225	168-306	248-386	416	
400		40-210	44-255	-	250-458	110-274	-	310-478	542	
400*		67-226	65-270	-	268-475	136-290	-	336-494	558	
500	HB23/140	40-310	44-355	-	250-558	110-374	-	310-578	642	
500*		67-326	65-370	-	268-575	136-390	-	336-594	658	
630		40-440	44-485	-	250-688	110-504	-	310-708	772	
630*		67-456	65-500	-	268-705	136-520	-	310-724	788	

* Clamping range for 4 jaw chucks

TOP JAWS, SOFT – WBL/WBS

SAV 269.31

For power chucks KT and QLC, SAV 260.31 and 260.32



WBL = lightweight format
WBS = heavy format

For KT and QLC-power chucks Ø 160 and Ø 200

Type	Dimensions in mm								Weight in kg/piece
	A	B	C	D	B1	L	L1	y _s	T
WBL11	70	40	40	S11	17	22	15	31,5	1/16" x 90°
WBS11	70	40	60	S11	17	22	15	31,5	1/16" x 90°
WBS11	70	60	60	S11	17	22	15	31,5	1/16" x 90°
WBL11	80	40	40	S11	17	22	25	35	1/16" x 90°
WBS11	90	40	40	S11	17	22	25	35	1/16" x 90°
WBS11	90	40	60	S11	17	22	25	35	1/16" x 90°
WBS11	90	40	80	S11	17	22	25	35	1/16" x 90°
WBS11	90	60	60	S11	17	22	25	35	1/16" x 90°
WBS11	90	60	80	S11	17	22	25	35	1/16" x 90°

For KT and QLC-power chucks Ø 250 und Ø 315

Type	Dimensions in mm								Weight in kg/piece
	A	B	C	D	B1	L	L1	y _s	T
WBL12	110	50	50	S12	21	26	30	51	1/16" x 90°
WBS12	120	50	50	S12	21	28	30	59	1/16" x 90°
WBS12	120	50	80	S12	21	28	30	59	1/16" x 90°
WBS12	120	50	100	S12	21	28	30	59	1/16" x 90°
WBS12	120	60	60	S12	21	28	30	59	1/16" x 90°
WBS12	120	60	80	S12	21	28	30	59	1/16" x 90°
WBS12	120	60	90	S12	21	28	30	59	1/16" x 90°

For KT and QLC-power chucks Ø 400, Ø 500 und Ø 630

Type	Dimensions in mm								Weight in kg/piece
	A	B	C	D	B1	L	L1	y _s	T
WBL23	140	60	60	S23	25,5	35	30	58	3/32" x 90°
WBS23	155	60	60	S23	25,5	35	30	58	3/32" x 90°
WBS23	155	60	90	S23	25,5	35	30	58	3/32" x 90°
WBS23	155	60	120	S23	25,5	35	30	58	3/32" x 90°
WBS23	155	80	80	S23	25,5	35	30	58	3/32" x 90°

Top jaws with other dimensions, cross tenon or metric serrations are available upon request.
Clawed jaws or workpiece-specific special jaws are available upon request.

Ordering example:

Top jaw, soft SAV 269.31 - WBL12 - 110 - 50 - 50
Designation SAV - No. - Type - A - B - C

CHUCK FLANGES AND ADAPTOR PLATES

SAV 260.80

For power chucks FNC, KT and QLC, SAV 260.30, 260.31 and 260.32

Chuck flange with bayonet ring fixing for spindle noses J, DIN 55022, DIN 55027, ISO 702/III

Nominal size	C	Spindle nose	Flange type	Dimensions in mm				Stud bolts and collar nuts		Chuck flange Type J
				B	D	L1	L2	Size	Piece	
160	Z5	J4	FF140-J4	50	18	104,8	85,0	J4	3	
175	Z5	J5	FF140-J5	50	24	104,8	104,8	J5	4	
200	Z6	J5	FF170-J5	60	24	133,4	104,8	J5	4	
200	Z6	J6	FF170-J6	65	28	133,4	133,4	J6	4	
250	Z8	J6	FF220-J6	80	28	171,4	133,4	J6	4	
315	Z8	J8	FF220-J8	80	32	171,4	171,4	J8	4	
315	Z11	J8	FF300-J8	90	32	235,0	171,4	J8	4	
400	Z11	J11	FF300-J11	90	35	235,0	235,0	J11	6	
400	Z15	J11	FF380-J11	120	35	330,2	235,0	J11	6	
500	Z15	J15	FF380-J15	120	42	330,2	330,2	J15	6	
630	Z15	J11	FF380-J11	120	35	330,2	235,0	J11	6	
630	Z15	J15	FF380-J15	120	42	330,2	330,2	J15	6	

Ordering example: Chuck flange Designation SAV 260.80 - FF170-J5 - Flange type

Ordering example: Stud bolts Designation SAV 260.80 - J4 - Size

Chuck flange with Camlock fixing for spindle noses D, DIN 55029, ISO 702/II, ASA B 5.9 D1

Nominal size	C	Spindle nose	Flange type	Dimensions in mm				Stud bolts and collar nuts		Chuck flange Type D
				B	D	L1	L2	Size	Piece	
160	Z5	D4	FF140-D4	50	28	104,8	85,0	D4	3	
175	Z5	D5	FF140-D5	50	30	104,8	104,8	D5	6	
200	Z6	D5	FF170-D5	60	30	133,4	104,8	D5	6	
200	Z6	D6	FF170-D6	65	35	133,4	133,4	D6	6	
250	Z8	D6	FF220-D6	80	35	171,4	133,4	D6	6	
315	Z8	D8	FF220-D8	80	40	171,4	171,4	D8	6	
315	Z11	D8	FF300-D8	90	40	235,0	171,4	D8	6	
400	Z11	D11	FF300-D11	90	45	235,0	235,0	D11	6	
400	Z15	D11	FF380-D11	120	45	330,2	235,0	D11	6	
500	Z15	D15	FF380-D15	120	50	330,2	330,2	D15	6	
630	Z15	D11	FF380-D11	120	45	330,2	235,0	D11	6	
630	Z15	D15	FF380-D15	120	50	330,2	330,2	D15	6	

Ordering example: Chuck flange Designation SAV 260.80 - FF170-D5 - Flange type - Size

Ordering example: Stud bolts Designation SAV 260.80 - D4 - Size

Chuck flange including fixing bolts for spindle noses K, DIN 55022, DIN 55027, ISO 702/III

Nominal size	C	Spindle nose	Flange type	Dimensions in mm				Corresponding bolts DIN 912 10.9	Chuck flange Type K
				B	D	L1	L2		
160	Z5	K4	ZWF140-K4	50	20	104,8	85,0	3 x M10 x 20	
175	Z5	K4	ZWF140-K4	50	20	104,8	85,0	3 x M10 x 20	
200	Z6	K5	ZWF170-K5	60	24	133,4	104,8	4 x M10 x 25	
250	Z8	K6	ZWF220-K6	80	28	171,4	133,4	4 x M12 x 30	
315	Z8	K6	ZWF220-K6	100	28	171,4	133,4	4 x M12 x 30	
400	Z11	K8	ZWF300-K8	90	32	235,0	171,4	4 x M16 x 35	
500	Z15	K11	ZWF380-K11	120	35	330,2	235,0	6 x M20 x 40	
630	Z15	K11	ZWF380-K11	120	35	330,2	235,0	6 x M20 x 40	

Ordering example: Chuck flange Designation SAV 260.80 - ZWF 170-K5 - Flange type

Adaptor plate for spindle noses, DIN 55021 A, DIN 55026 A, ISO 702/I, A2, ASA, B 5.9

Nominal size	C	Spindle nose	Flange type	Dimensions in mm			Adaptor plate
				D	L2	L	
160	Z5	K5	ZWS140-K5	18	104,8	10	
175	Z5	K5	ZWS140-K5	18	104,8	10	
200	Z6	K6	ZWS170-K6	24	133,4	15	
250	Z8	K8	ZWS220-K8	28	171,4	15	
315	Z8	K8	ZWS220-K8	28	171,4	15	
400	Z11	K11	ZWS300-K11	32	235,0	20	
500	Z15	K15	ZWS380-K15	35	330,2	20	
630	Z15	K15	ZWS380-K15	35	330,2	20	

Ordering example: Adaptor plate Designation SAV 260.80 - ZWS 170-K6 - Flange type

PRECISION-JAW CHUCKS

With 2 or 3 clamping jaws

Application:

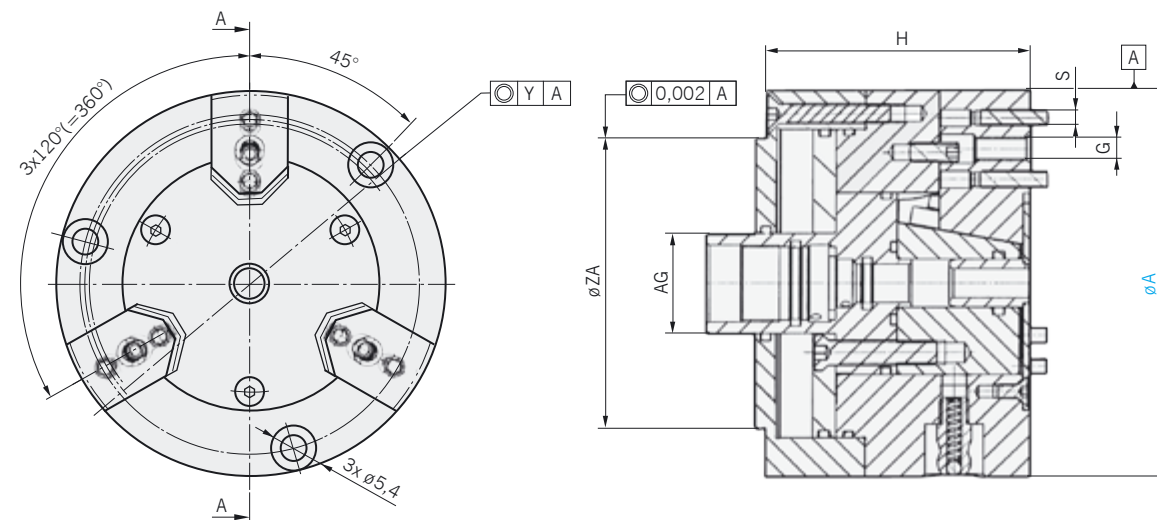
For high precision turning operations
at high revolution speeds

Features:

- Standard format: B
- for coolant delivery: C = Coolant;
- for central lubrication: L = Lubrication;



SAV 260.50



Dimensions in mm				Connecting thread	Jaw locator interface			Revolutions	Clamping force	Clamping repeat accuracy	Weight in kg
A	No. of jaws	ZA	H	AG	Index pins S	Thread G	Jaw stroke	min ⁻¹	at 6 bar		
50	3	19	38,5	M 7x0,75	ø 2,5 (2x)	M4 (1x)	2,00	9600	264 daN	0,0015	0,6
50	2	19	38,5	M 7x0,75	ø 2,5 (2x)	M4 (1x)	2,00	9600	264 daN	0,0015	0,6
80	3	60	54,2	5/8"-32 UN	ø 3,175 (2x)	M5 (1x)	2,50	6000	420 daN	0,002	1,7
80	3	60	38,2	5/8"-32 UN	ø 3,175 (2x)	M5 (1x)	0,70	6000	420 daN	0,002	1,3
80	2	60	38,2	5/8"-32 UN	ø 3,175 (2x)	M5 (1x)	0,70	6000	420 daN	0,002	1,3
80	2	60	54,2	5/8"-32 UN	ø 3,175 (2x)	M5 (1x)	2,50	6000	420 daN	0,002	1,7
100	3	82,55	62,1	5/8"-32 UN	ø 3,175 (3x)	M5 (2x)	5,00	5500	660 daN	0,002	3,0
100	2	82,55	62,1	5/8"-32 UN	ø 3,175 (3x)	M5 (2x)	5,00	5500	660 daN	0,002	3,0
100	3	82,55	54,6	5/8"-32 UN	ø 3,175 (3x)	M5 (2x)	2,50	6000	660 daN	0,002	2,8
100	3	82,55	99,9	5/8"-32 UN	ø 3,175 (3x)	M5 (2x)	10,00	5200	660 daN	0,0025	4,8
100	2	82,55	99,9	5/8"-32 UN	ø 3,175 (3x)	M5 (2x)	10,00	5200	660 daN	0,0025	4,8
100	2	82,55	54,6	5/8"-32 UN	ø 3,175 (3x)	M5 (2x)	2,50	6000	660 daN	0,002	2,8
150	3	125	55,8	5/8"-32 UN	ø 3,175 (4x)	M5 (4x)	2,50	5000	1200 daN	0,002	6,6
150	2	125	55,8	5/8"-32 UN	ø 3,175 (4x)	M5 (4x)	2,50	5000	1200 daN	0,002	6,6
200	2	167,6	80,6	5/8"-32 UN	ø 6.330 (3x)	M10 (2x)	2,50	3500	3090 daN	0,0025	18,1

Further information upon enquiry and layout

Ordering example:

Precision-jaw chuck SAV 260.50 - 200 - 2 - B
Designation SAV - No. - A - Number of jaws - Format

ACCESSORIES – AIR FEED TUBE

SAV 269.50

Application:

- for precision-jaw chucks SAV 260.50

Example Features:

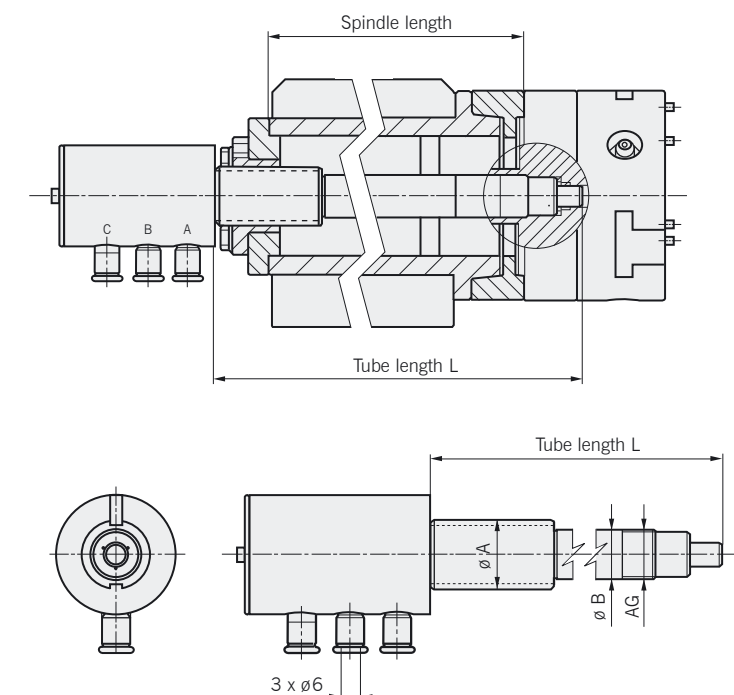
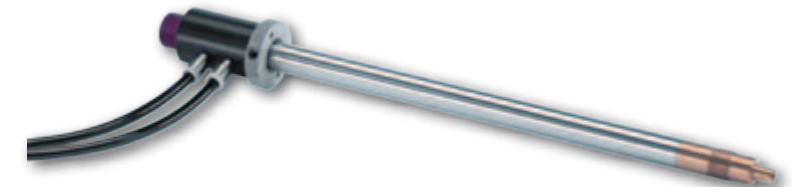
- Type BSA with additional central air feed
- n max 6000 min⁻¹

Important: For spindle lengths ≥ 600 mm the tube must be supported by a ring in the centre of the spindle in order to avoid bending at high revolutions.

Please note that the axial movement of the tube should not be restricted!

For production purposes, the customer must supply exact details of the spindle length or the length L of the air feed tube.

The design is always based on the specific Machine (Spindle specification required).



Type	Dimensions in mm		Connection thread	Tube length	Supply connections		Revolutions
	A	B	AG	L	Air	Cooling lubricant	min ⁻¹
BSA	23 h7	16	5/8"-32 UN	nach Absprache	3	-	6000
BSC	23 h7	16	5/8"-32 UN	nach Absprache	2	1	6000
BS	23 h7	16	5/8"-32 UN	nach Absprache	2	-	6000
C	-	11	7/16"-28 UNEF	nach Absprache	2	-	6000
CC	-	11	7/16"-28 UNEF	nach Absprache	2	1	3000
B	-	16	5/8"-32 UN	nach Absprache	2	-	4000
BC	-	16	5/8"-32 UN	nach Absprache	2	1	3000
N	-	10	3/8"-32 UNEF	nach Absprache	2	-	10000
F	-	7	M 7 x 0,75	nach Absprache	2	-	11000

Ordering example:

Air feed tube SAV 269.50 - BSC
Designation SAV - No. - Type

FACE PLATES

With cylindrical centering mounting

Application:

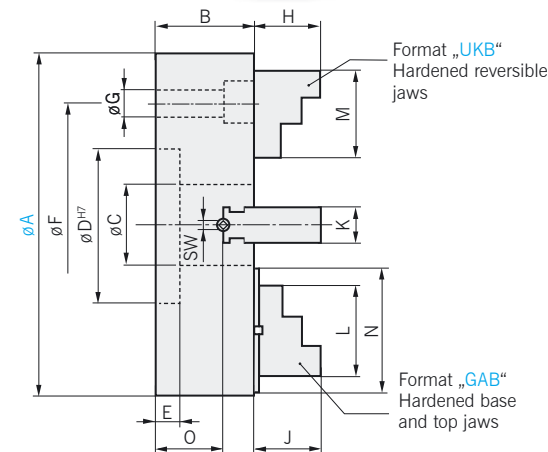
The face plate is a clamping chuck for lathes on which large, heavy or irregularly shaped workpieces are clamped in a vertical or horizontal position for machining.

Due to the large centrifugal forces and the eccentric centre of gravity, they must only be operated within a certain rotational speed range. The faceplate jaws are individually adjustable to accommodate the form of the workpiece.

In order to achieve 'true-running', that means a symmetrical movement, counterweights are bolted on to the face plate to counteract any rotational imbalances. In addition, clamping aids, such as covers or similar clamps, are used for very large diameter or perforated workpieces. Due to the very low spindle pitch of the individual jaws or through the use of a power clamping screws very large clamping force can be achieved. The face plate jaws are operated manually. Face plate diameters of up to 12 metres are common. Clamping on the face plate is time consuming as the workpiece must be positioned manually.

Features:

- Steel chuck body
- Mounting with cylindrical centering; short taper DIN 55026, DIN 55027 and DIN 55029 optional
- With one-piece, hardened reversible jaws „UKB“ or with base and hardened reversible top jaws „GAB“
- From $\varnothing 700$ mm with extended base jaws
- Standard formats up to $\varnothing 2000$ mm available



Other sizes and custom designs are available upon request.

Dimensions in mm														No. Bore holes G	Weight in kg
A	B	C	D ^{H7}	E	F	G	H	J	K	L	O	M	N		
210	60	60	85	5	104,8	10,5	40	47	30	94	35	78	74	8	11
250	65	60	110	5	133,4	12,7	40	47	30	94	40	78	74	8	19
300	80	75	110	7	133,4	12,7	46	55	34	103	51	100	86	10	30
315	70	75	110	7	133,5	12,7	40	47	30	94	45	78	74	8	21
350	90	75	140	7	171,5	16,8	48	62	38	115	61	110	97	12	40
400	90	75	140	7	171,5	16,8	48	62	38	115	61	110	97	12	49
450	90	90	140	7	171,5	16,8	58	88	42	158	57	140	135	12	66
500	110	120	140	7	171,5	16,8	58	88	42	158	77	140	135	12	85
600	120	120	200	10	235,0	21,5	60	88	50	158	84	140	135	14	125
700	130	143	200	10	235,0	21,5	80	93	55	170	89	170	300	15	200
800	140	143	200	10	235,0	21,5	80	93	55	170	99	170	300	15	240
900	150	143	200	10	235,0	21,5	80	93	55	170	109	170	300	15	310
1000	175	143	200	10	235,0	21,5	80	93	55	170	134	170	300	15	400
1100	180	190	300	15	330,2	21,5	83	91	70	170	114,5	225	350	20	620
1200	180	190	300	15	330,2	21,5	83	91	70	170	114,5	225	400	20	850
1300	180	190	300	15	330,2	21,5	83	91	70	170	114,5	225	475	20	1050
1400	200	260	300	15	330,2	21,5	100	116	70	200	134,5	250	475	20	1200
1500	200	260	300	15	330,2	21,5	100	116	70	200	134,5	250	525	20	1300
1600	215	260	420	15	463,6	26	100	116	70	200	149,5	250	525	20	1600
1800	230	260	420	15	463,6	26	100	116	70	200	164,5	250	525	20	1850
2000	230	260	420	15	463,6	26	100	116	70	200	164,6	250	525	20	2300

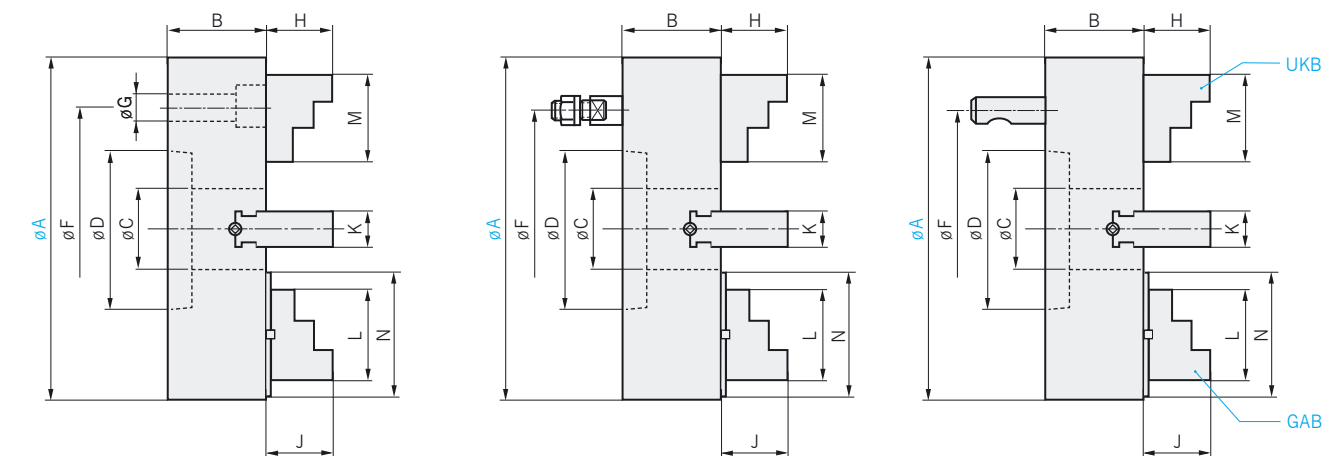
Ordering example:

Face plate SAV 260.60 - 250 - UKB
Designation SAV - No. - A - Jaw specification

SAV 260.60

FACE PLATES

With short taper fixing



Direct mounting K – DIN55026

Bayonet mounting J – DIN55027

Camlock mounting D – DIN55029

A	Spindle size	Dimensions in mm											Stud bolts	Camlock bolts	Weight in kg
		B	C	D	F	G	H	J	K	L	M	N			
210	4	60	60	63,5	82,6 85**	4 x 11	40	47	30	94	78	74	3	3	11
210	5	60	60	82,6	104,8	4 x 11	40	47	30	94	78	74	6	3	11
250	4	65	60	63,5	82,6 85**	4 x 11	40	47	30	94	78	74	3	3	15
250	5	65	60	82,6	104,8	4 x 11	40	47	30	94	78	74	6	6	15
250	6	65	60	106,4	133,4	4 x 13	40	47	30	94	78	74	6	6	15
315	5	70	75	82,6	104,8	4 x 11	40	47	30	94	78	74	6	6	21
315	6	70	75	106,4	133,4	4 x 13	40	47	30	94	78	74	6	6	21
400	6	90	75	106,4	133,4	4 x 13	48	62	38	115	110	97	4	6	49
400	8	90	75	139,7	171,4	4 x 17	48	62	38	115	110	97	4	6	49
500	6	110	100	106,4	133,4	8 x 13	58	62	38	115	140	135	4	6	85
500	8	110	120	139,7	171,4	8 x 17	58	88	42	158	140	135	4	6	85
500	11	110	120	196,8	235,0	8 x 22	58	88	42	158	140	135	6	6	85
600	6	120	100	106,4	133,4	8 x 13	60	88	42	158	140	135	4	6	118
600	8	120	120	139,7	171,4	8 x 17	60	88	50	158	140	135	4	6	118
600	11	120	120	196,8	235	8 x 22	60	88	50	158	140	135	6	6	118
600	15	120	120	285,8	330,2	8 x 23,5	60	88	50	158	140	135	6	6	118
700	8	130	130	139,7	171,4	8 x 17,5	80	93	55	158	170	300	4	6	200
700	11	130	143*	196,8	235	8 x 22	80	93	55	158	170	300	6	6	200
700	15	130	143*	285,8	330,2	8 x 23,5	80	93	55	158	170	300	6	6	200
700	20	150	143*	412,8	463,6	8 x 26	80	93	55	170	170	300	6	6	200
800	8	140	130	139,7	171,4	8 x 17	80	93	55	170	170	300	4	6	240
800	11	140	143*	196,8	235	8 x 22	80	93	55	170	170	300	6	6	240
800	15	140	143*	285,8	330,2	8 x 23,5	80	93	55	170	170	300	6	6	240
800	20	150	143*	412,8	463,6	8 x 26	80	93	55	170	170	300	6	6	240

* Can be delivered with a larger bore, max. dimensions upon request
** For DIN 55027

For formats J and D, the stud bolts or camlock bolts are included in the delivery. Other accessories and clamping jaws are available upon request.

Ordering example:

Face plate SAV 260.60 - 400 - 8 - K - UKB
Designation SAV - No. - A - Spindle size - Mounting format - Jaw specification

BOX JAWS



SAV 260.70

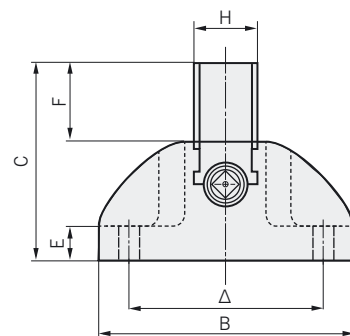
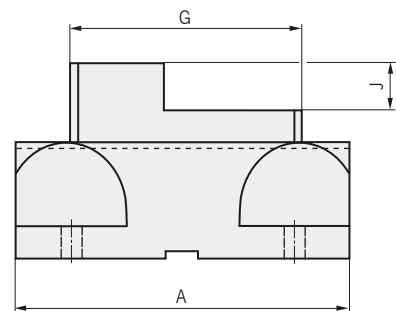
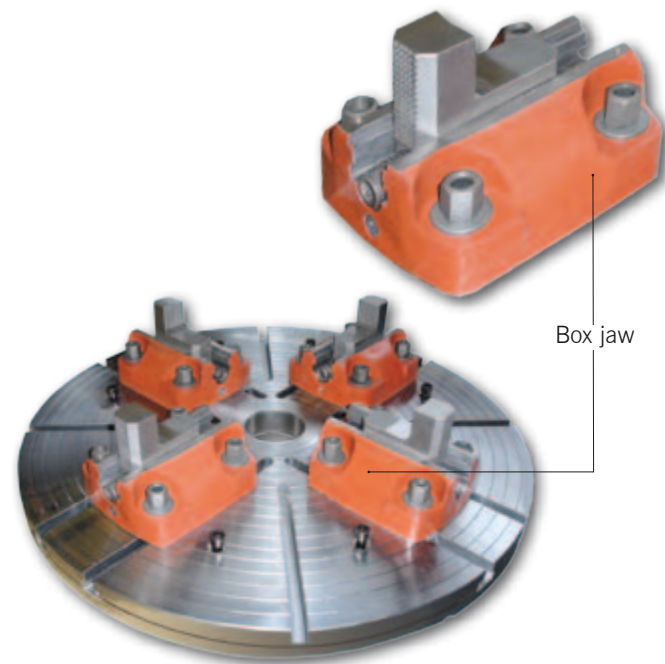
Application:

Box jaws are designed for use as clamps on clamping plates with T-slots or as individual clamping solutions for machines. The large clamping forces are suitable for the machining of heavy workpieces and large machining operations. The flexible clamping of workpieces with irregular contours or geometrically round or angled shapes is possible as the jaws can be adjusted individually. Box jaws were developed to clamp workpieces on milling/turning centres as well as vertical turret lathes.

Features:

A cotter to take up radial forces is included in the delivery.

* The standard delivery does not include bore holes for fixings. These must be bored on-site in the applicable dimension Δ to correspond with the table slots. If required, the order can be supplied at an extra charge with the holes pre-bored. Please provide the distance dimensions and diameter in your request and/or order.



Other formats are available upon request.

A 1:5 torque amplifier can be installed for ease of actuation.

Nominal size	Md _{max} in daNm	Clamping force in kN	Dimensions in mm										Weight in kg
			A	B	C	E	F	G	H	J	Δ_{min}^*	Δ_{max}^*	
1	35	56	250	200	170	60	80	145	55	60	130	160	24
2	35	56	250	240	170	60	80	145	55	60	140	200	28
4	32	50	180	160	145	25	59	140	50	45	95	125	13
5	35	56	250	220	175	50	80	145	55	60	135	180	31
6	40	58	250	220	175	50	80	145	65	60	140	180	32
9	50	65	330	260	230	55	100	200	80	65	185	210	65
10	50	70	450	320	266	55	116	250	100	80	220	260	130
12	50	70	550	375	305	55	120	300	110	80	250	300	220

Ordering example:

Box jaw SAV 260.70 - 4
Designation SAV - No. - Nominal size

CHAPTER OVERVIEW

CHAPTER 2

Pages 41 - 60

SPECIAL CHUCKS

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
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	244.75	Mechatronic chucks	Independent jaw activation via electric axes Centering/clamping via the jaws Magnetic axial clamping	43
	244.99	Combined chucks	Power actuated centering via the jaws Magnetic axial clamping	44
	260.99-RSF	Radial chucks Radial chuck variants 2 + n Jaws	Flexible application	45 - 47
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	—	Clamping concepts Special parts	Highly flexible due to the modular design	60

OPTIONS AND THEIR BENEFITS

HIGH ROTATIONAL SPEED

Low centrifugal force design

- Open chuck bodies
- More rigid, closed chuck bodies

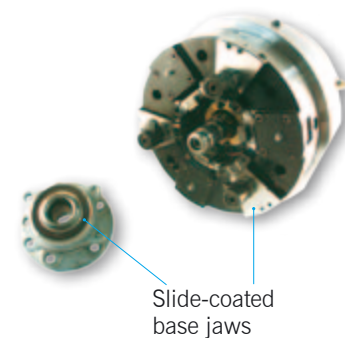
Centrifugal force compensation via a counterweight

- More rigid, closed chuck bodies
- Optimised jaw weights
- Sealed jaws



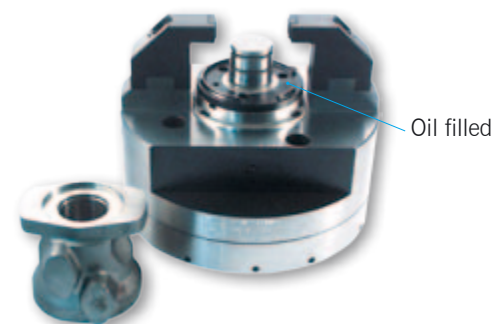
SUITABLE FOR AUTOMATIC LOADING/UNLOADING

- Configuration of the clamping devices for gripping systems
 - Portal loaders or robots
 - Pick-up
- Workpiece control
- Dealing with swarf and shavings
 - Blowing unit
 - Flushing/rinsing mechanism
 - Shaving bell



LOW MAINTENANCE

- Sealed jaws
- Sealing air pressurization
- Slide coated
- Central lubrication
- Oil filled



MECHATRONIC CHUCKS



SAV 244.75

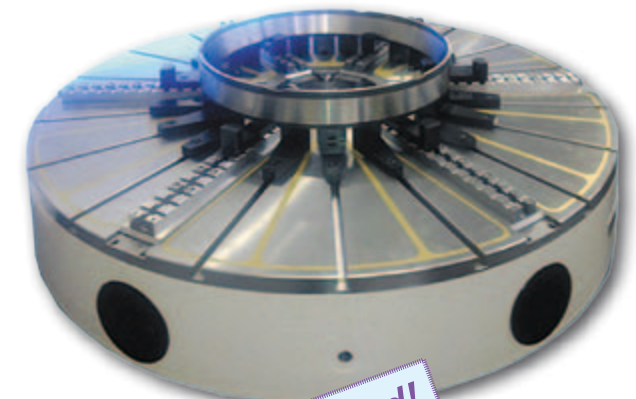
Combination magnetic clamping technology and electric servo drives

Application:

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

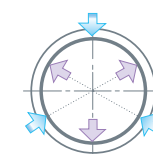
Combination circular magnet – electric linear axes:

- Servo drive with integrated brakes
- 300 daN clamping force per actuator at D 1000 mm
- Direct measurement system with a 0.001mm resolution
- 50 mm clamping stroke with quick-change jaws
- Electronic centrifugal force compensation
- Enhanced magnetic system with optimized pole division
- Magnetic material under each pole for minimal field heights
- 350 mm minimal magnetic area
- Smallest available chuck diameter 800 mm at 100 daN clamping force per jaw
- With 165 mm minimum height
- System without magnets for non-ferromagnetic workpieces also available upon request



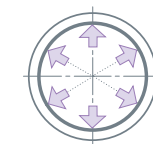
Patent granted!
Patent-No. 10 2009 047 996

Chucks without magnets available upon request.



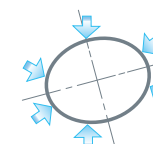
Variant A

- 3 axis centred
- 3 axes engage internally or externally



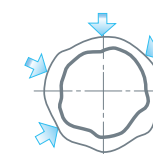
Variant B

- 6 axis centred
- Internal or external engagement



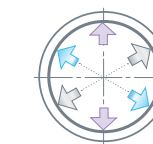
Variant C

- Clamping of oval parts



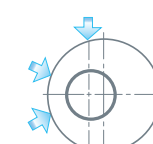
Variant D

- Manual workpiece positioning with dial gauge
- Magnetic pre-clamping
- 6 axis independent engagement and clamping



Variant E

- Centred per 2 opposing axes



Variant F

- Clamping of eccentric parts at changing orientations to the spindle

COMBINED CHUCKS

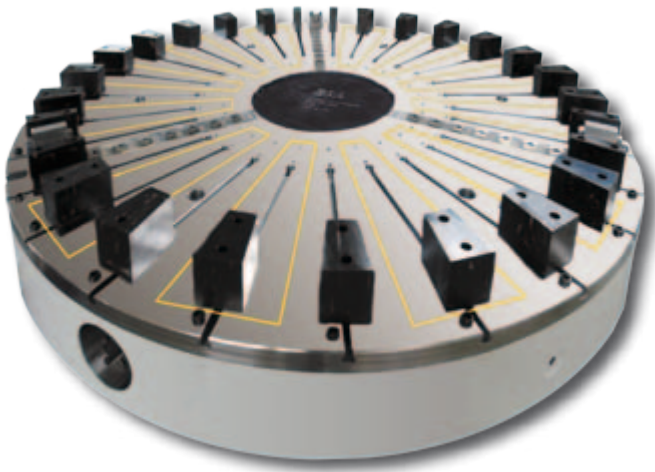


SAV 244.76

The innovative combination of magnetic clamping with centering chucks – complete system solutions from one supplier

- Benefits:**
- Reproducible centering
 - Process reliability
 - The combination of the first and second clamping stages is possible
 - Compact design (Heights from 170 mm)

- Magnetic system format:**
- Electro-permanent combi/hybrid magnetic chuck Type SAV 244.76, enhanced magnetic system with holding forces of up to 170 N/cm² on the induction surface
 - Fully metallic pole plate with brass, insulating inlays and T-slots (according to DIN 650-10H10) for the installation of fixed and moveable pole extensions
 - Pole plate wear abrasion limit 8mm; Replaceable after long-term use and wear
 - Supplied upon request with a heavy machinery plug with a quick-fit coupling



- Centering chuck example format:**
- Power actuated chuck SAV 260.20
 - Centering accuracy of the chuck 0.02 mm; Centering range from 450 mm - 1200 mm; Magnetic clamping area from 500 mm - 1100 mm.
 - Chuck supplied with extended base jaws; A full clamping range from 500 mm - 1200 mm can be centred without gaps
 - Clamping force of the chuck 180 KN at 210 Nm
 - Stroke per jaw 9.6 mm
 - The centering chuck's jaw release mechanism is operated via a control rod
 - Sealed spindle with precise bearings

Diameter in mm	Pole pairs	Number of jaws	Height in mm	Active diameter in mm	Weight in kg	Control
500	6	3	170	250 bis 464	260	30 A
600	9	3	170	300 bis 564	378	30 A
800	9	3	170	300 bis 764	670	30 A
1000	12	6	180	450 bis 950	1100	60 A
1200	12	6	180	450 bis 1150	1600	60 A x 2
1400	12	6	180	450 bis 1350	2180	60 A x 2
1600	12	6	200	500 bis 1430	3160	60 A x 2
1800	18	6	200	600 bis 1750	4000	60 A x 2

- Special features:**
- Resistent to emulsions according to IP 65
 - Optionally available: The rotary drive can be activated via the spindle
 - Activation via the demagnetising cycle; Pre-selection of eight holding force stages
 - System with potential-free activation of the enable signals; complete integration into the machine control system possible; Plug connector formats with a 'park' position for contact control, to ensure the plug is correctly located before enabling.

Other design formats available upon request. Power actuation possible upon clarification of the spindle integration.

Ordering example:
 Combination chuck SAV 244.76 - 1800 x 18 - 6 - 360 V
 Designation SAV - No. - Diameter x Pole pairs - Number of jaws - Magnet voltage

RADIAL CHUCKS



SAV 260.99-RSF

3 + 3 JAW CHUCKS

- Description:**
- 3 + 3 jaw chuck with two independently actuated clamping circles
 - Easily adaptable from centred to balanced operation
 - Jaw stroke 15 mm (Stroke per jaw)
 - Base jaws with modular toothing

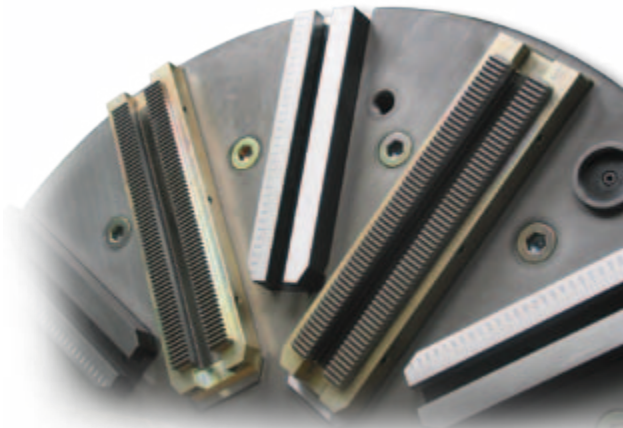
- Example workpieces:**
- Gearbox casing

- Example format:**
- Diameter 800 mm



JAW INTERFACE WITH MODULAR TOOTHING

- Description:**
- Jaw interface can be selected with modular toothing
 - The jaws are sealed for upright installation
 - Stops or supports in the slot and key system can be stagelessly adjusted
 - This positioning can be scale-adjusted



RADIAL CHUCKS

2 + 3 JAW CHUCKS

Description:

- Special chuck with 2 independent rows of clamps
- Clamping row 1 = 2 jaws, stroke per jaw 9 mm
- Clamping row 2 = 3 jaws, stroke per jaw 12 mm

Example workpieces:

- Distributor housing

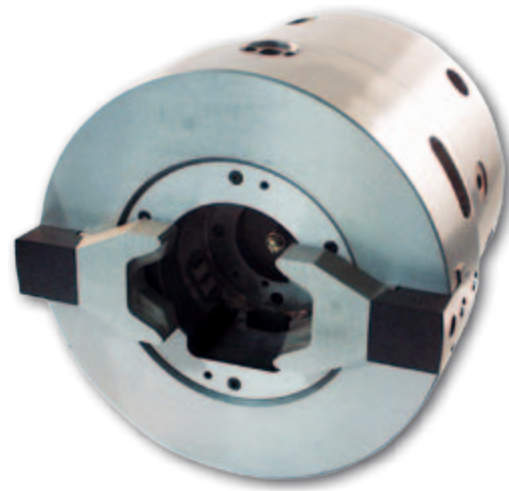
Example format:

- Diameter 350 mm

Ordering example:



SAV 260.99-RSF



RADIAL CHUCK VARIANTS

6-JAW CHUCKS

Description:

- 6-jaw power chuck
- Base jaws with serrations
1/16" x 90° Slot 21 mm

Example format:

- Diameter 450 mm



SAV 260.99-RSF



RADIAL CHUCKS

6-JAW FRONT-END CHUCKS

Description:

- 6-jaw front-end chuck; hydraulically actuated

Example workpieces:

- Guide rods

Example format:

- Diameter 420 mm

Ordering example:



SAV 260.99-RSF



RADIAL CHUCK VARIANTS

2 x 3-JAW CHUCKS

Description:

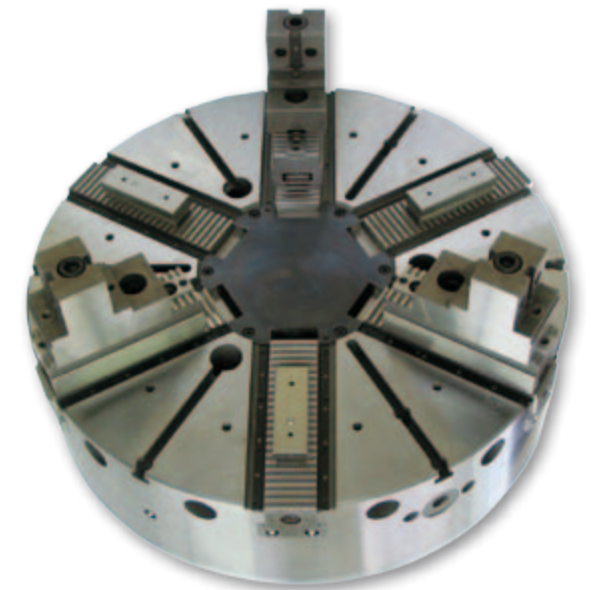
- Centred and balanced clamping operations (not switchable)
- Jaw stroke 15 mm (Stroke per jaw)
- Quick-change jaw system

Example format:

- Diameter 700 mm



SAV 260.99-RSF



FACE CLAMPING ROTARY CHUCK



SAV 260.99-PSF

Description:

- Hydraulically actuated face chuck
- With spring loaded centering cone

Example workpiece:

- Centre plate

Example format:

- Diameter 420 mm



3-JAW FACE CLAMPING ROTARY CHUCK



SAV 260.99-PSF

Description:

- 2 spring-loaded conical mounts
- 3 clamping levers with axial tensioning
- Integrated flushing jets through the spindle of the turning centre

Example workpiece:

- Cast aluminium casing

Example format:

- Diameter: 420 mm



FACE CLAMPING ROTARY CHUCK



SAV 260.99-PSF

Description:

- Hydraulically actuated face chuck
- Mechanically locked ancillary and clamping pistons

Example workpieces:

- Stub axles

Example format:

- Diameter 420 mm



CENTERING AND ROTARY FACE CHUCKS



SAV 260.99-ZPSF

Description:

- For insertion in workpiece bore holes
- 2 independent clamping pistons
 - Piston 1: centering
 - Piston 2: face clamping
- Main clamping tension via clamping fingers

Example workpiece:

- Thin-walled gear bushes in the 2nd clamping stage

Example format:

- Diameter 230 mm



CENTERING AND ROTARY FACE CHUCKS



SAV 260.99-ZPSF

Description:

- Centering and rotary face chuck

Example workpiece:

- Ring gear

Example format:

- Diameter 300 mm



CENTERING AND ROTARY FACE CHUCKS



SAV 260.99-ZPSF

Description:

- Centering and rotary face chuck
- Centering via a spring-loaded collet
- Pull-down tension compensated via angled bolts

Example workpiece:

- Flange plate

Example format:

- Diameter 250 mm



CENTERING AND ROTARY FACE CHUCKS



SAV 260.99-ZPSF

Description:

- With centering mechanism
- Quick refitting to machine 2 workpiece sizes
- Workpiece with quench distortion: oversize sensing
- 3-finger rotary chuck (axial fingers)
- 3 synchronised, clampable form bolts for positioning in the tooth gap

Example workpiece:

- Flat toothed wheels

Example format:

- Diameter 315 mm



COMBINATION CHUCKS



SAV 260.99-KSF

Description:

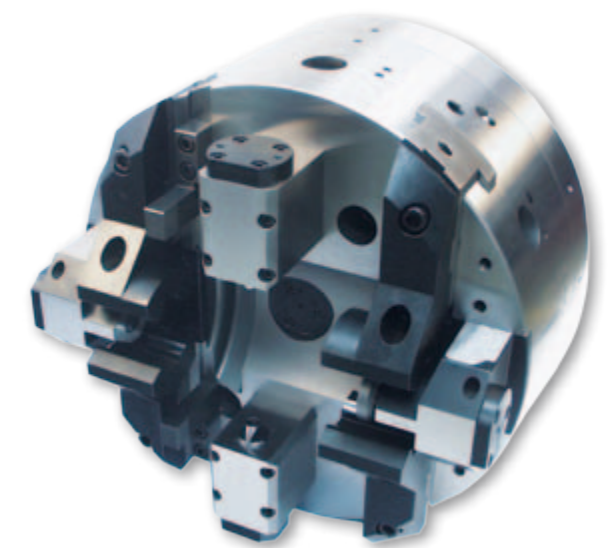
- 2 x 2-jaw chuck
- Angle-positioned clamping on workpiece surfaces
- Axial symmetric chuck with feed control

Example workpiece:

- Diameter 230 mm

Example format:

- Diameter 400 mm



COMPENSATING CHUCKS



SAV 260.99-AGF

Description:

- Wedge hook system with floating pistons and compensating jaws
- 4-jaw power chuck
- With 2 fixed and 2 compensating jaws
- Sealed chuck

Example format:

- Diameter 500 mm



PULL-DOWN CHUCKS



SAV 260.99-NSF

Description:

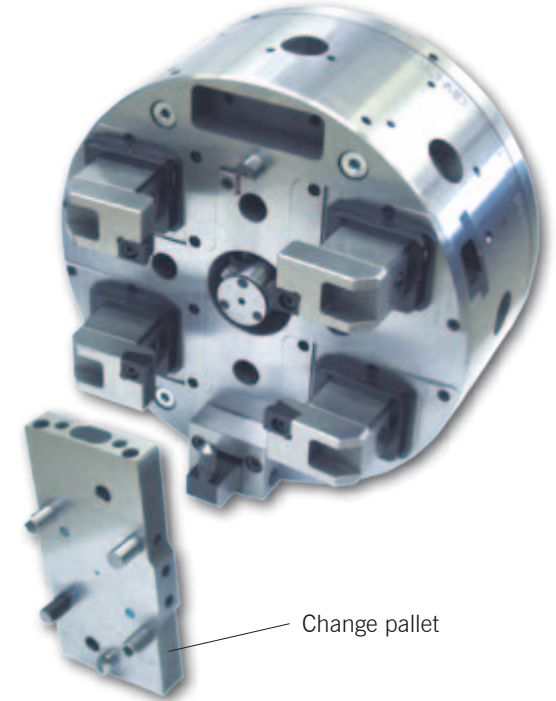
- The clamping jaws are independent and compensate hydraulically
- The clamping jaws are locked mechanically
- Centering via a mandrel

Example workpiece:

- Distributor plate

Example format:

- Diameter 300 mm



COMPENSATING CHUCKS



SAV 260.99-AGF

Description:

- 2-jaw compensating chuck
- With spring-loaded centering point

Example workpiece:

- Steering shaft with head

Example format:

- Diameter 160 mm



PULL-DOWN CHUCKS



SAV 260.99-NSF

Description:

- 2-jaw power chuck
- Axial retraction of 0 - 4 mm can be preset
- Oil filled chuck
- Low maintenance
- Centering via a mandrel

Example workpiece:

- Valve housing

Example format:

- Diameter 260 mm



INDEXING CHUCKS

Description:

- Hydraulically actuated indexing chuck
- Swivel range 4x 90° or 2x 180°
- For multi-sided machining
- Centred clamping

Example workpiece:

- Oil distributor housing

Example format:

- Diameter 430 mm



SAV 260.99-SF

SHAFT CHUCKS

Description:

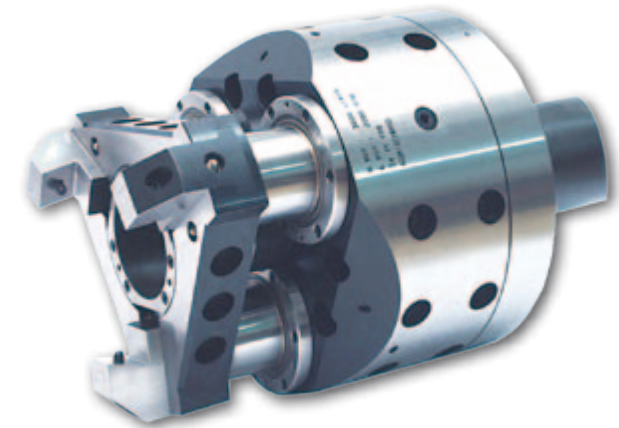
- Shaft chuck
- Centring via a fixed clamping point or mandrel
- Radial tension compensating
- High transmission of forces due to the radial tension
- Axially detachable

Example workpiece:

- Centred shafts

Example format:

- Diameter 330 mm



SAV 260.99-WSF

INDEXING CHUCKS

Description:

- Hydraulically actuated indexing chuck
- For multi-sided machining
- Console clamping

Example workpiece:

- Rocker arm block

Example format:

- Diameter 320 mm



SAV 260.99-SF

CONSOLE CHUCKS

Description:

- Console chuck
- With radial workpiece support
- Workpiece contact stop with an air controlled unit

Example workpiece:

- Hydraulic housing

Example format:

- Diameter 250 mm



SAV 260.99-KF

CONSOLE CHUCKS

Description:

- Console chuck
- With centring jaws
- Spring actuated pre-centering before activation

Example workpiece:

- Angle housing

Example format:

- Diameter 170 mm



SAV 260.99-KF

FRONT- AND TAILSTOCKCHUCKS

Description:

- Front-end and tailstock chucks for special lathes for pipe-end machining
- Hydraulic 12-point chuck; transposable from centred to compensated clamping
- Front-end chucks also have an integrated pre-centring function in the area in front of the clamping jaws
- After centring, the centring jaws retract completely behind the chuck face

Example workpiece:

- Pipes for the oil industry

Machining:

- Pipe- end machining (Bevelling, chamfering and tapping)

Example format:

- Diameter: 1140 mm
- Clamping range: 6 1/2" - 16"
- Clamping force: 40.000 daN
- Max. RPM: 500 U/min



SAV 260.99-VEF / HEF

CONSOLE CHUCKS

Description:

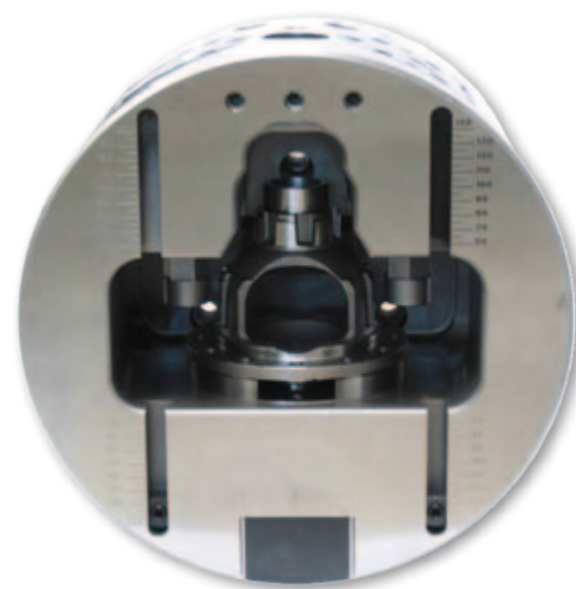
- Fixed console; Tension applied via 2 radial pistons

Example workpiece:

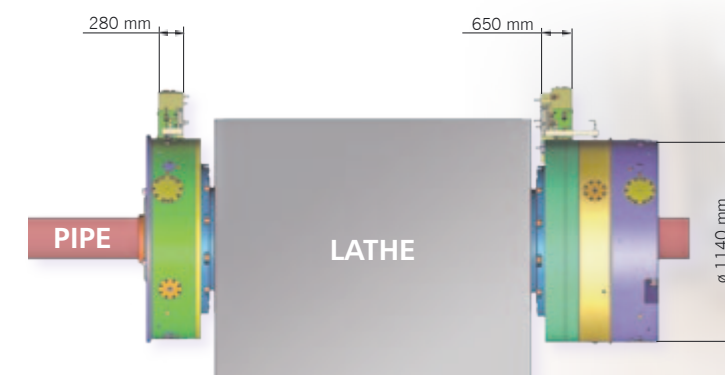
- Thrust bearing housing

Example format:

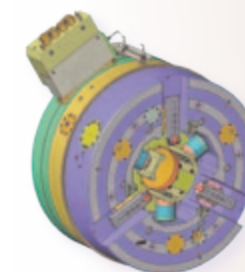
- Diameter 400 mm



SAV 260.99-KF



~ 1600 kg



~ 3500 kg



COLUMN CHUCKS

Description:

- 3-finger rotary chuck (angled fingers)
- Actuation of the chuck's axial tension disc by an electromagnet
- Spring-loaded release of the chuck
- Chuck body made from high-tensile aluminium; Hard coated and non-magnetic

Example workpiece:

- Slip rings

Example format:

- Diameter 315 mm



SAV 260.99-SBF

COLLET CHUCKS

Description:

- Custom-design collet chuck
- With air seal and water feed
- Axfix clamping system
- max. RPM 7500 $\frac{1}{\text{min}}$

Example workpiece:

- Ring with a clamping diameter 90 mm

Example format:

- Diameter 130 mm



SAV 260.99-SZF



3-FINGER CHUCKS

Description:

- 3-Finger rotary face chuck
- Clamping on ball studs on the thread
- Hardened chuck body
- Type-specific sphere clamping $\pm 0,002$

Example workpiece:

- Gear components

Example format:

- Diameter 350 mm



SAV 260.99-PSF

COLLET CHUCKS

Description:

- Power actuated collet chuck
- For clamping range 21 - 35 mm
- With a fixed workpiece stop

Example workpiece:

- Centered precision shafts

Example format:

- Diameter 125 mm



SAV 260.99-SZF



CLAMPING CONCEPTS – MODULAR

Description:

- Centering and rotary face chuck
- Modular concept
- With damping piston
- Tension control via the valve plunger and oil flow test

Example workpiece:

- Sheet metal casing

Example format:

- Diameter 620 mm



SPECIAL PARTS

Combined mandrel

Description:

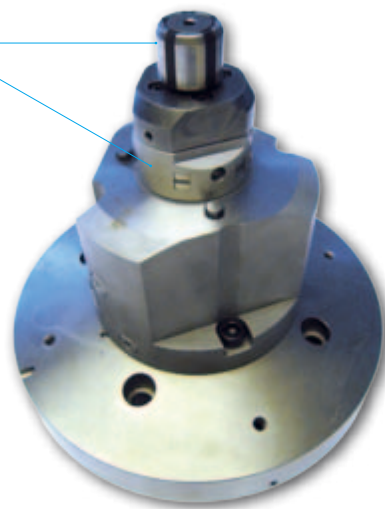
- Segment clamping mandrel above – Clamping level I
- Sliding jaw mandrel below - Clamping level II

Example workpiece:

- Casing 2nd clamping

Example format:

- Diameter 80 x Diameter 250 x 300 mm



CHAPTER OVERVIEW

CHAPTER 3

Pages 61 - 66

STANDARD MANDRELS

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
	261.10	Collet mandrel, power actuated	For small workpieces Also for automation	62
	261.11	Collet mandrel, Manually operated	For small workpieces Suitable for small batches	63
	261.90	Collets for Collet mandrels	As accessories for SAV 261.10 und SAV 261.11	64
	261.13	Lamella mandrel	Large clamping stroke, Also for automation	65

COLLET MANDRELS – POWER ACTUATED



SAV 261.10

Application:

- Exchangeable collets provide flexibility
- Expansion of the collets of 0.8 mm
- Suitable for automatic loading
- Repeat clamping accuracy is smaller than 0.012 mm
- Collets with sealed vulcanised slits can also be supplied
- Simple and safe handling due to the stroke restriction

Features:

- Double cone expansion of up to max. 0.8 mm.
- The power actuated flange can be mounted on the machine spindle by means of a intermediate flange
- Exchangeable pendulum or fixed Stopps are optimally designed for your workpieces and can be supplied if required.

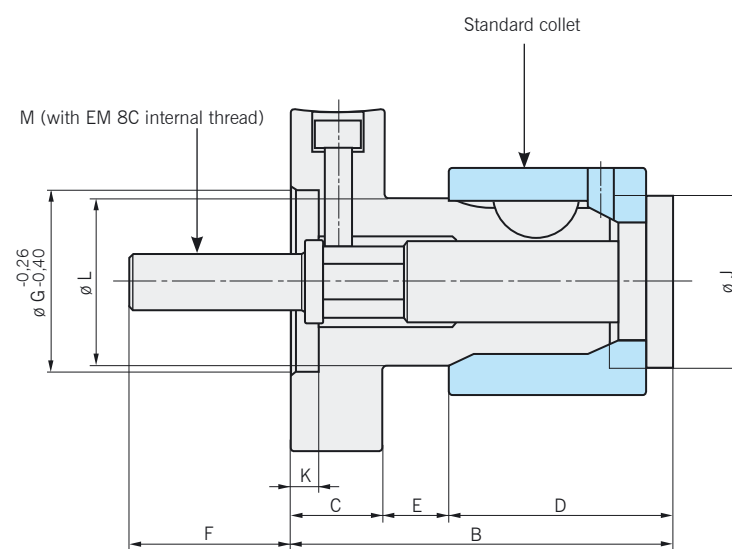
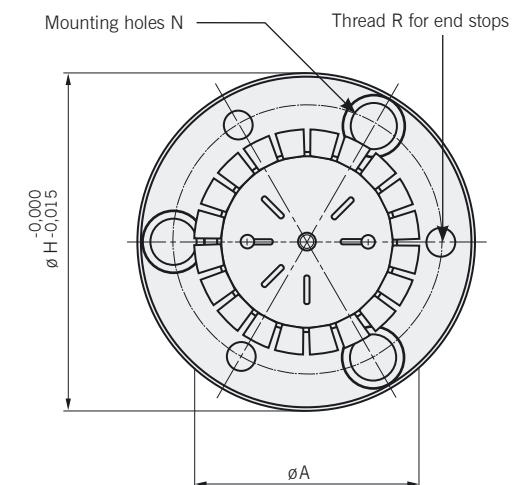
Delivery scope:

- Without collet (see SAV 261.90)

Pre-tensioned collets are required to ensure trouble-free functioning of the mandrel. The clamping cones of the mandrels and collets must be in permanent contact.



Axial tension



Type	Total clamping range		Dimensions in mm																Actuation force F _{max} in daN
			B	C	D		E	F	G	H	J	K	L	M	N		R		
	C1*	C2*			Fixing										Fixing				
			min	max	Pitch circle	Bolts	Pitch circle	Bolts											
EM3A	12,5	22,0	60	20	22,0	26,0	14,6	20	40	75	11,0	6	12,6	M4	58	M8	28	M4	500
EM2C	16,0	28,0	66	20	27,0	32,0	15,0	22	40	75	15,0	6	14,1	M8	58	M8	28	M4	1000
EM1C	22,0	40,0	72	20	32,0	38,0	15,5	30	40	75	20,0	6	20,7	M8	58	M8	58	M6	1200
EM18C	28,5	51,0	79	20	38,0	45,0	15,3	31	40	75	26,5	6	26,3	M10	58	M8	58	M6	1800
EM4C	41,0	73,5	84	20	43,0	50,0	14,8	36	40	75	37,5	6	37,0	M12	58	M8	58	M6	2300
EM5C	63,5	89,0	109	25	51,0	60,0	25,3	36	60	120	55,0	6	57,3	M20	94	M10	94	M8	2800
EM6C	76,2	102,0	118	25	57,0	69,0	24,7	37	60	120	74,5	6	71,1	M20	94	M10	94	M8	3200
EM7C	89,9	143,0	133	30	63,5	78,5	25,2	47	100	180	86,5	6	84,1	M24	150	M12	150	M10	3700
EM8C	130,0	178,0	153	30	79,5	99,5	24,6	22	100	180	24,0	6	123,0	M36	150	M12	150	M10	5500

Ordering example:

Collet mandrel Designation SAV 261.10 - EM 3A
SAV - No. - Type

*C1 and C2 see page 64

COLLET MANDRELS – MANUALLY ACTUATED



SAV 261.11

Application:

- Primarily used for small batch production or as testing mandrels

Features:

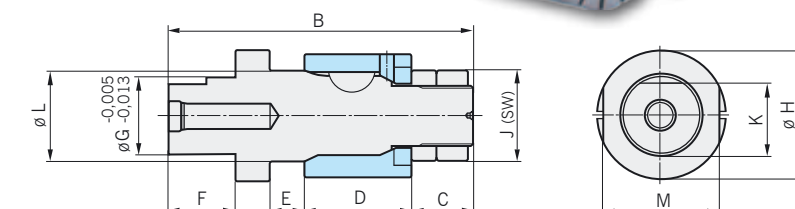
- Dimension G is tolerated as a fit-size, in order that precise mounting on the flange is possible.
- Pointed mandrel with 260° centering arc
- Endstops mountable on the section indicated by diameter L

Delivery scope:

- Without collet (see SAV 261.90)



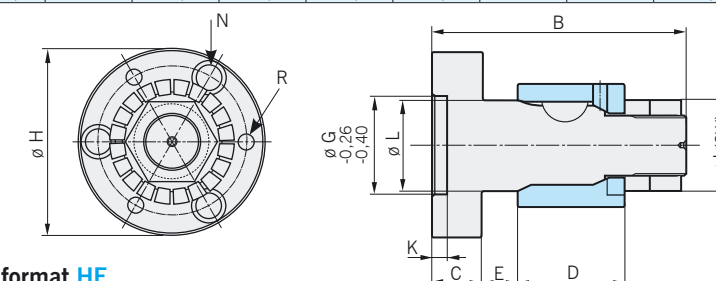
Axial tension



Pointed mandrel Build format HS

Type	Total clamping range		Dimensions in mm											
			B	C	D		E	F	G	H	J	K	L	M
	min	max			C1*	C2*								
EM3A	12,5	22,0	77	16,0	22,0	26,0	10,0	20	20	26,0	10	18	9,5	22
EM2C	16,0	28,0	83	17,0	27,0	32,0	9,0	20	20	26,0	13	18	14,1	22
EM1C	22,0	40,0	99	18,5	32,0	38,0	10,5	27	30	40,0	19	27	20,7	26
EM18C	28,5	51,0	107	20,8	38,0	45,0	10,2	27	30	40,0	24	27	26,3	26
EM4C	41,0	73,5	120	27,0	43,0	50,0	10,0	27	30	50,0	36	27	37,0	46
EM5C	63,5	89,0	145	33,0	51,0	60,0	26,0	35	40	57,3	55	35	57,3	50
EM6C	76,2	102,0	155	37,0	57,0	69,0	26,0	35	50	71,1	65	45	71,1	60
EM7C	89,9	143,0	205	47,5	63,5	78,5	34,0	50	60	84,1	ø 85	55	84,1	70
EM8C	130,0	178,0	235	50,5	79,5	99,5	55,0	50	80	123,0	ø124	73	123,1	105

*C1 and C2 see page 64



Flange mandrel Build format HF

Type	Total clamping range		Dimensions in mm												N Pitch circle Fixing	R Pitch circle Stops
			B	C	D		E	G	H	J	K	L				
	min	max			C1*	C2*										
EM3A	12,5	22,0	73	20	22,0	26,0	15,0	40	75	10	6	12,6	28	M8	28	M4
EM2C	16,0	28,0	79	20	27,0	32,0	15,0	40	75	13	6	14,1	28	M8	28	M4
EM1C	22,0	40,0	86	20	32,0	38,0	15,5	40	75	19	6	20,7	58	M8	58	M6
EM18C	28,5	51,0	94	20	38,0	45,0	15,2	40	75	24	6	26,3	58	M8	58	M6
EM4C	41,0	73,5	105	20	43,0	50,0	15,0	40	75	36	6	37	58	M8	58	M6
EM5C	63,5	89,0	134	25	51,0	60,0	25,0	60	120	55	6	57,3	94	M10	94	M8
EM6C	76,2	102,0	144	25	57,0	69,0	25,0	60	120	65	6	71,1	94	M10	94	M8
EM7C	89,9	143,0	166	30	63,5	78,5	25,0	100	180	ø 85	6	84,1	100	M12	150	M10
EM8C	130,0	178,0	185	30	79,5	99,5	25,0	100	180	ø124	6	123,0	100	M12	150	M10

*C1 and C2 see page 64

Ordering example:

Collet mandrel Designation SAV 261.11 - EM 18C - HS
SAV - No. - Type - Build format

COLLETS FOR COLLET MANDRELS

SAV 261.90

LAMELLA MANDREL

SAV 261.13

Application:

- For trouble-free use on all EM-mandrels

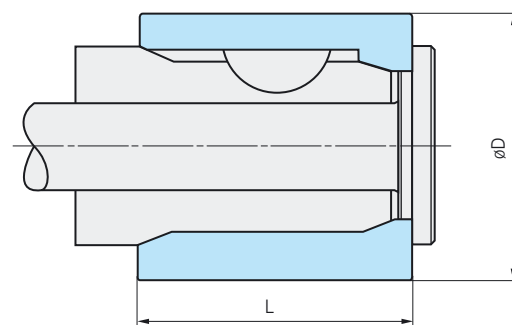
Features:

- The desired, perfect clamping geometry is achieved through the double cone expansion of up to max. 0.8 mm.
- The collets are modularly exchangeable without regrinding.
- Finish-grinding and regrinding is possible on-site.
- Repeat clamping accuracy is smaller than 0.012 mm.
- Collets with sealed vulcanised slits can also be supplied (Format "V")

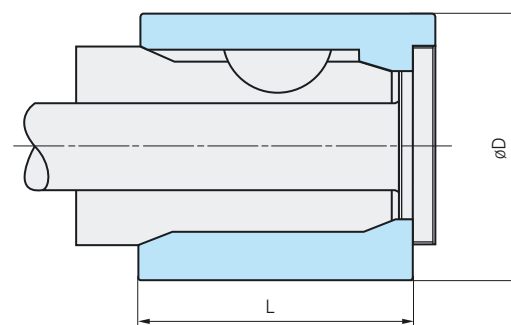
Custom format collets are available to solve special problems e.g. short, long or profiled.



C1 – Standard



C2 – with countersunk draw bar head



Type 1	Dimensions in mm		
	Clamping range Dmin	Clamping range Dmax	L
3A1	12,5	16,0	22,0
2C1	16,0	22,0	27,0
1C1	22,0	28,5	32,0
18C1	28,5	41,0	38,0
4C1	41,0	63,5	43,0
5C1	63,5	76,2	51,0
6C1	76,2	89,0	57,0
7C1	89,9	130,0	63,5
8C1	130,0	178,0	80,0

Type 2	Dimensions in mm		
	Clamping range Dmin	Clamping range Dmax	L
3A2	16,5	22,0	26,0
2C2	22,0	28,0	32,0
1C2	28,0	40,0	38,0
18C2	40,0	51,0	45,0
4C2	51,0	73,5	50,0
5C2	73,5	89,0	60,0
6C2	89,0	102,0	69,0
7C2	101,0	143,0	78,5
8C2	143,0	178,0	99,5

Recommended Initial tension in mm
0,13
0,13
0,13
0,13
0,26
0,26
0,26
0,39
0,39

When ordering, append the clamping diameter (workpiece diameter) to the ordering designation e.g. 40 H7
Orders with vulcanised slits "V".

Ordering example:

Collet SAV 261.90 - 18C1 - V - 40 H7
Designation SAV - No. - Type - Vulcanised slits - Clamping diameter

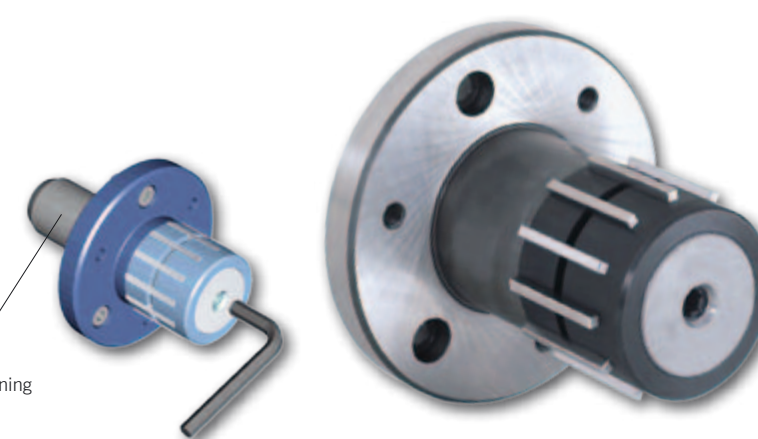
Application / Benefits:

- Suitable for automatic loading
- Large clamping stroke
- Repeat clamping accuracy under 0.01 mm
- Unaffected by soiling
- Axial Fix

Features:

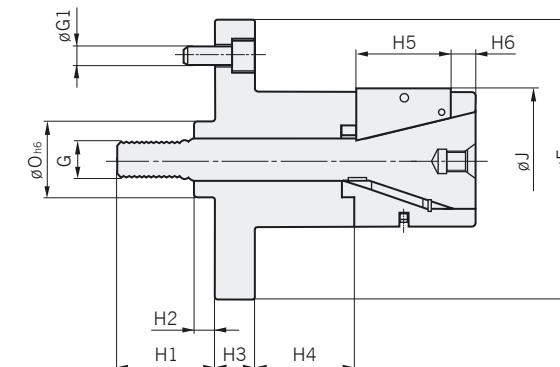
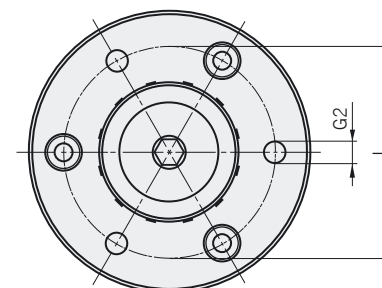
- Uncompromising clamping geometry ensures tight, consistent machining tolerances.
- The mandrels can also be tensioned manually by using the attachment.

Attachment
for manual tensioning



Axial Fix

Prices and delivery times available upon request.



Size	Dimensions in mm									No. of lamella	Actuation Faxial max. (daN)	Clamping force Fsp max. (daN)
	J Clamping range	H1 min - max	H2	H4	G	L	G1	G2	Oh6			
D 1-25L	25-28	21,5-28	8	15	M6	65	M8	M5	12	8	250	500
D 1-28L	28-31	21,5-28	8	15	M6	65	M8	M5	12	8	250	500
D 1-31L	31-34	21,5-28	8	15	M6	65	M8	M5	12	8	250	500
D 1-34L	34-37	24,5-31	8	25	M8	65	M8	M5	16	8	360	720
D 1-37L	37-40	24,5-31	8	25	M8	65	M8	M5	16	8	360	720
D 2-40L	40-43	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-43L	43-46	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-46L	46-49	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-49L	49-52	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-52L	52-55	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-55L	55-58	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-58L	58-61	35-41,5	9	35	M12	90	M8	M6	22	10	1000	2000
D 2-60L	60-65	42-53	9	44	M16	90	M8	M8	32	12	1800	3600
D 2-65L	65-70	42-53	9	44	M16	90	M8	M8	32	12	1800	3600
D 2-70L	70-75	42-53	9	44	M16	90	M8	M8	32	12	1800	3600
D 2-75L	75-80	42-53	9	44	M16	90	M8	M8	32	12	1800	3600
D 3-80L	80-88	51-67,5	9	60	M20	135	M10	M10	40	14	2800	5600
D 3-88L	88-96	51-67,5	9	60	M20	135	M10	M10	40	14	2800	5600
D 3-96L	96-104	51-67,5	9	60	M20	135	M10	M10	40	14	2800	5600
D 3-104L	104-112	51-67,5	9	60	M20	135	M10	M10	40	14	2800	5600
D 3-112L	112-120	51-67,5	9	60	M20	135	M10	M10	40	14	2800	5600
D 3-120L	120-128	51-67,5	9	60	M20	135	M10	M10	40	14	2800	5600

Ordering example:

Lamella mandrel SAV 261.13 - D2-40L
Designation SAV - No. - Size Please enquire.

APPLICATIONS

- Special mandrels - also for stationary applications
- High productivity by adapting to the workpiece and the process

CHAPTER OVERVIEW

CHAPTER 4

Pages 67 - 74

SPECIAL MANDRELS

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
	261.99-GBSD	Sliding jaw mandrels	For long, thin-walled parts	68 - 69
	261.99-DDSD	Hydraulic expansion mandrels	Small stroke for precision workpieces	70
	261.99-SSD	Segment mandrels	Large stroke; hard clamping surfaces	70
	261.99-HSD	Collet mandrel	Flexibly adaptable to the workpiece diameter	71 - 73
	261.99-ZSD	Centering mandrels	Robust and low-maintenance	74
	261.99-VDSD	Geared mandrel	To clamp internal gear toothing	74

SLIDING JAW MANDREL

Description:

- Power actuated sliding jaw mandrel
- Clamping in 2 levels with spring-loaded compensation
- High clamping accuracy
- Hard sliding jaws (62 HRC)
- Sliding jaw retraction via a dovetail guide
- Large jaw stroke
- The clamping surface of the sliding jaws have latticed diamond serration toothing
- Workpiece backstop at $\varnothing 90$ mm
- Only available as custom-made products

Application:

- Clamping in the centre bore

Example format:

- Clamping diameter 60 mm
- Length 300 mm



SAV 261.99-GBSD



SLIDING JAW MANDREL

Description:

- Power actuated sliding jaw mandrel
- For 2nd clamping stage
- Clamping in 2 levels with 9 sliding jaws each using spring-loaded compensation
- Sliding jaws covered by an inter-mediate bush
- Spindle connector according to DIN 55026 Gr. 6

Application:

- Clamping in the centre bore

Example format:

- Clamping diameter 147,5 mm



SAV 261.99-GBSD



SLIDING JAW MANDREL

Description:

- With 2 clamping levels
- Power actuated sliding jaw mandrel
- Tangentially arranged clamping jaws
- For 2nd clamping stage
- The sliding jaws have a smooth clamping surface
- Stroke per jaw Level 1: 2.1 mm
- Stroke per jaw Level 2: 1.6 mm
- One jaw equipped with a pendulum jaw for improved adaption to the workpiece countours
- Spring-loaded fixing pin

Application:

- Clamping in the centre bore

Example format:

- Clamping diameter 73 mm



SAV 261.99-GBSD



SLIDING JAW MANDREL

Description:

- Power actuated sliding jaw mandrel
- Mandrel with 9 sliding jaws
- With forced release
- Mandrel with retractable workpiece stops

Example format:

- Clamping diameter 94 mm



SAV 261.99-GBSD



HYDRAULIC EXPANSION MANDREL



SAV 261.99-DDSD

Description:

- Manually actuated hydro-expansion mandrel $\varnothing$ 28 mm
- For extreme clamping accuracy
- Only available as custom-made products
- With adjustment ring

Application:

- Clamping in the centre bore

Example format:

- Clamping diameter 28 mm



COLLET MANDREL



SAV 261.99-HSD

Description:

- Power actuated collet mandrel $\varnothing$ 62.04 mm
- Mandrel with retractable workpiece centering pins

Application:

- Clamping in the centre bore

Example format:

- Diameter 65 mm
- Diameter 150 x 125 mm



SEGMENT MANDREL



SAV 261.99-SSD

Description:

- Segment mandrel with collet and tension bolts
- Long service life
- High clamping accuracy
- Hard segments (62 HRC)

Application:

- Clamping in the centre bore

Example format:

- Diameter ca. 200 x 150 mm



COLLET MANDREL



SAV 261.99-HSD

Description:

- Power actuated mandrel
- Standard collet with special core
- 3 integrated and adjustable jets for the coolant
- Bayonet coupling for a quick change of the mandrel

Application:

- Clamping in the centre bore

Example format:

- Clamping diameter 30 mm



COLLET MANDREL

Description:

- Pneumatic actuated Spanndorn
- With integrated pneumatic cylinder
- Minimal clamping depth
- Small clamping diameter

Application:

- Clamping in the centre bore

Example format:

- Clamping diameter 13.2 mm



SAV 261.99-HSD



COLLET MANDREL

Description:

- Power actuated mandrel
- Mandrel with bayonet quick-change system

Example format:

- Clamping diameter 80 mm
- Clamping diameter 25 mm



SAV 261.99-HSD



4

COLLET MANDREL

Description:

- Power actuated collet mandrel
- Workpiece contact stop with an air controlled unit

Application:

- Clamping in the centre bore

Example format:

- Clamping range $\varnothing$ 32 - 55 mm



SAV 261.99-HSD



COLLET MANDREL

Description:

- Mandrel with involute contour
- Stationary clamping module with integrated clamping piston
- Toothed collet – clamping in the pitch circle
- Quickly changed workpiece stop

Application:

- Clamping in the gear toothing
- Multiple clamping device

Example format:

- Clamping diameter 13.2 mm



SAV 261.99-HSD



CENTERING MANDREL

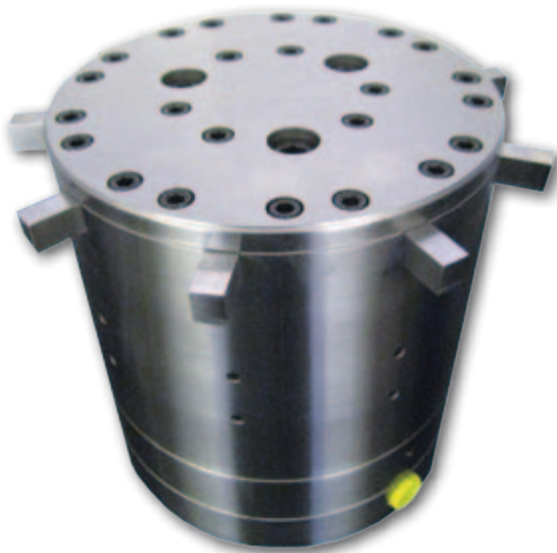


SAV 261.99-ZSD

Description:
 - Hydraulically actuated mandrel for low distortion clamping by balancing the jaws

Example workpiece:
 - Uneven interior diameters

Example format:
 - ca. 250 mm



GEARED MANDREL



SAV 261.99-VDSD

Description:
 - Power actuated geared mandrel

Application:
 - Clamping in the toothing (pitch circle)

Example format:
 - Diameter 50 x 150 mm



CHAPTER OVERVIEW

CHAPTER 5

Pages 75 - 84

ACCESSORIES

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
	269.99-PSB	Special pendulum jaws	For easily deformed parts	76 - 77
	249-99-USB	Special chucks; comprehensive frictional coefficients	High machining parameters through intelligent design	78
	-	Jaw coating	Diamond and CBN coating Tungsten carbide coating	79
	269.90	RotoRiP boring ring set	To bore clamping jaws precisely	80 - 81
	-	Service / Service provision / testing	Optimal on-site service	82 - 83
	-	Integration options	For all machines; customer-specific	84
	269.98	High-performance lubrication paste	Ensures a long working life and a low level of clamping pressure loss for SAV special chucks.	84

SPECIAL PENDULUM JAWS

For external clamping

Description:

- Pendulum jaws for external clamping
- The stop is centrally adjustable

Example workpiece:

- Forged parts

Jaw interface:

- Modular straight toothing

Example format:

- Clamping diameter 210 - 270 mm

Jaw clamping surface format:

- The jaw format chosen can be considerably improve the machining parameters achieved.



SAV 261.99-PSB

SPECIAL PENDULUM JAWS

For internal clamping

Description:

- Hard pendulum jaws for internal clamping
- Clamping surface with pendulum gripper 6 x 60°
- For the clamping of mould drafts

Example workpiece:

- Cast workpieces

Jaw interface:

- Cross tenon

Example format:

- Clamping diameter 348 mm



SAV 269.99-PSB

SPECIAL PENDULUM JAWS

With pendulum inserts for 2-jaw chucks

Description:

- External clamping
- With 2 pendulum inserts per jaw

Example workpiece:

- Forged parts

Jaw interface:

- Serrations

Example format:

- Diameter 150 mm



SAV 249.99-PSB

SPECIAL PENDULUM JAWS

For internal clamping with workpiece axial stop

Description:

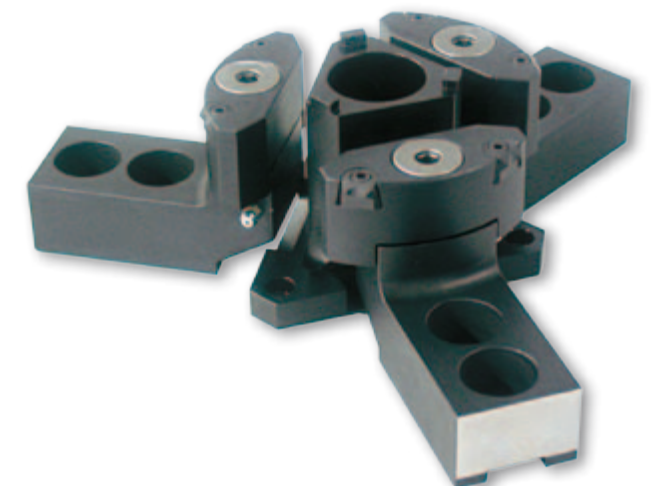
- Pendulum jaws for internal clamping
- External stop adapted to the workpiece

Jaw interface:

- Serrations

Example format:

- Clamping diameter 116 mm



SAV 269.99-PSB

SPECIAL JAWS – ENCLOSING

SAV 249.99-USB

For internal clamping

Description:

- Hard special jaws for internal clamping
- Clamping surface with latticed diamond serration toothing
- External stop

Example workpiece:

- Bushes

Jaw interface:

- Cross tenon

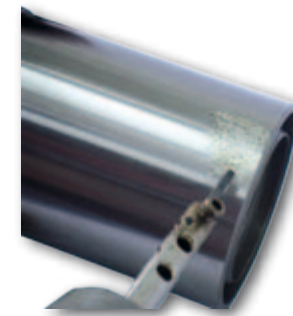
Example format:

- Diameter 217.55 mm



JAW COATINGS

TUNGSTEN CARBIDE, HARD COATED



Through the application of tungsten carbide layers to the previously treated surfaces, we are able to achieve a

- Layer hardness of 70 – 75 HRC – depending on the hardness and type of base material.
- Layer thicknesses of 5 - 25µm.

Quick and exactly localized surface hardening without deformation or loss of hardness of the base material.

DIAMOND AND CBN COATING

Diamond is the hardest known mineral. The hardness is however different in various crystal orientations. It exhibits the highest thermal conductivity of all known minerals. The weight is measured in carats – one unit is 0.200 grams.

Its use is extremely economical. Downtime costs and retooling times, for tools for example, can be minimised.

In large scale technical environments thin layers of diamond-like carbon serve as a protection against wear and increase the frictional properties.

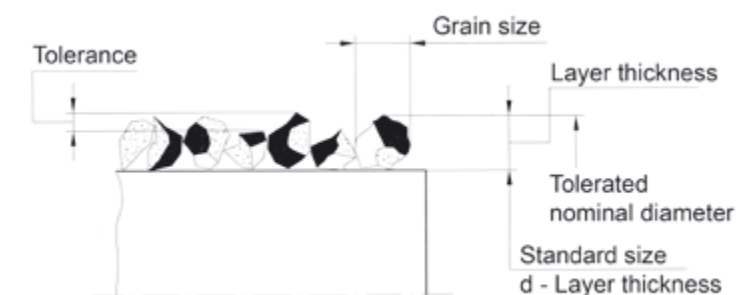


Table of standard sizes:

To determine the standard sizes of the tolerated dimensions of a single layer coating for galvanic-bonded diamond and CBN tools.

Please note:

Please ensure that the corresponding edge radius, even for sharp-edged bearer substrates, is at least equivalent to the layer thickness.

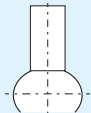
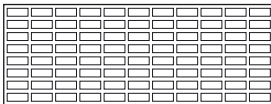
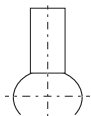
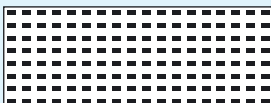
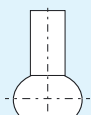
Grain size	Fine 25	Medium 54	Rough 0,91
Layer thickness (one-sided coating)	0,04 mm	0,09 mm	0,12 mm
Layer tolerance	± 0,02 mm	± 0,02 mm	± 0,02 mm
Application	For hardened workpieces	For non-hardened workpieces and GG materials	For Al, Al-pressure die cast parts, Ms, Mg and PVC-parts

Grain size (eng) D = Diamond B = CBN	Layer thickness per side of a single layer coating in mm	Tolerance + -
15	0,03	0,02
25	0,04	0,02
32 *	0,05	0,02
46	0,07	0,02
54	0,09	0,02
64	0,10	0,02
76	0,11	0,02
91 *	0,12	0,02
107	0,14	0,02
126	0,15	0,02
151	0,20	0,03
181 *	0,25	0,03
251	0,29	0,03
301	0,35	0,04
356	0,39	0,05
426	0,50	0,05
601	0,75	0,05

* Preferred size

FRictional COEFFICIENTS

For power actuated chucks

Jaw clamping face – Geometric form		Coefficient of tension μ_{sp}						Workpiece St 50	
		Tangential			Axial				
 Smooth		0,05	0,05	0,07	0,12	0,12	0,13	Fine finished	Workpiece surface
		0,08	0,10	0,11	0,15	0,20	0,22	Finished to roughed	
		0,11	0,14	0,15	0,22	0,28	0,31	Untreated	
 Latticed diamond serration toothing		0,10	0,12	0,13	0,17	0,22	0,24	Fine finished	
		0,15	0,20	0,22	0,29	0,35	0,40	Finished to roughed	
		0,22	0,28	0,31	0,41	0,50	0,55	Untreated	
 Serrated		0,17	0,22	0,24	0,29	0,36	0,40	Fine finished	
		0,29	0,36	0,40	0,48	0,50	0,55	Finished to roughed	
		0,41	0,50	0,55	0,57	0,84	0,92	Untreated	
PS Scroll chuck PK cam chuck KS Wedge bar chuck		PS	PK	KS	PS	PK	KS	Correction values for material	
		Chuck build type						Al Cu Mg Pb 0,97 Ms 58 0,92 GG-18 0,80	

ROTORIP-BORING RING SET



SAV 269.90

For clamping jaws



Application:
The patented rings make it possible to precisely bore out clamping jaws. Thanks to the fact that they are stagelessly adjustable, only the exact amount of material required must be removed. Due to the patented curved segments, a readjustment of the clamping position is possible as often as you wish. This saves time and tool costs.

- Features:**
- Internal and external clamping with only 1 ring
 - Stagelessly adjustable clamping range for all sizes
 - Exact adjustment of the boring diameter (1/10 mm)
 - Reduced set up times through the RotoFix clamp bolts
 - Large cost reduction on clamping jaws
 - Optimal accessibility for the turning tool
 - Quick and easy handling
 - Suitable for chuck diameters from 80 - 630 mm



Grinding



Internal clamping



External clamping

ROTORIP-BORING RING SET

SAV 269.90

For clamping jaws

Size	Chuck range	Delivery scope	Clamp bolts for counterbore	Set
RotoRiP - S	up to $\varnothing 200$ mm	20 boring rings + 2 sets of clamp bolts Storage stands	M8, M10	
RotoRiP - L	up to $\varnothing 250$ mm	29 boring rings + 3 sets of clamp bolts Storage stands	M8, M10, M12	
RotoRiP - LX	up to $\varnothing 315$ mm	29 boring rings, 3 of them reinforced + 3 sets of clamp bolts Storage stands	M8, M10, M12	
RotoRiP - XL	$\varnothing 400 - 630$ mm	10 reinforced boring rings Storage stands	M16, M20	



RotoRiP expansion rings with 4x90°- and 6x60°- curved segments for 2-, 4- and 6-jaw chucks are available as standard, upon request (RotoRiP-Quattro and RotoRiP-Six).
The uniform distribution of force is achieved by means of an expansion joint in the rings.

Ordering example:

Boring ring set SAV 269.90 - LX
Designation SAV - No. - Size

ROTOFIX CLAMP BOLTS

SAV 269.90

Features:
Due to their adjustment range of 2 mm, RotoFix clamp bolts compensate for the boring tolerances of various manufacturers. No reworking of the counterbore is necessary.

The RotoFix clamp bolts are delivered as a set but may also be ordered individually.

Available sizes:

- M6,
- M8,
- M10,
- M12,
- M14,
- M16,
- M20,
- M24

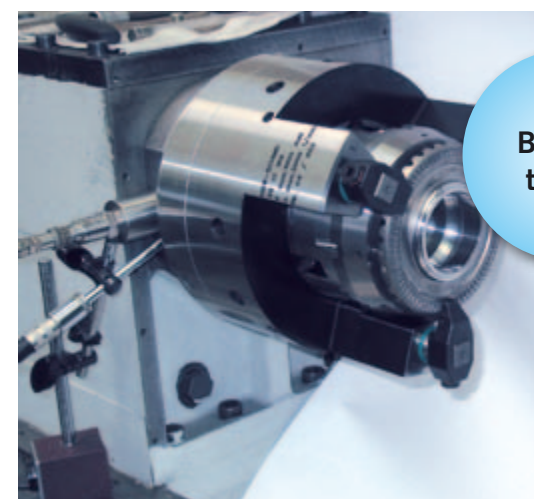
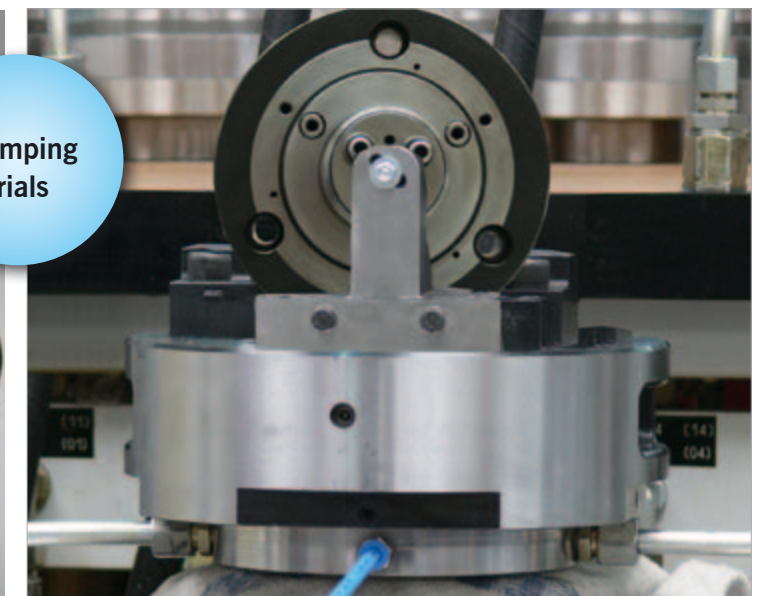
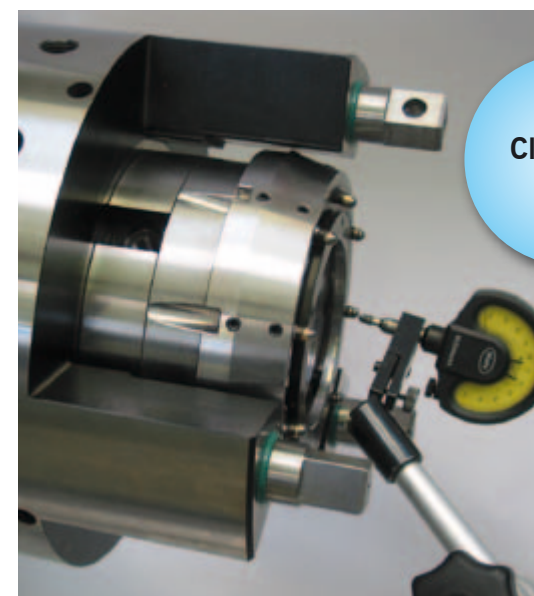
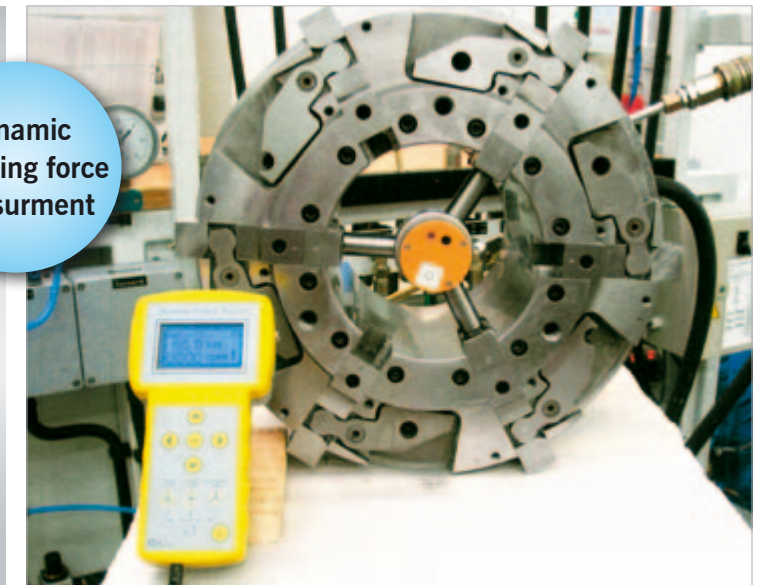
Ordering example:

RotoFix clamp bolts SAV 269.90 - M16
Designation SAV - No. - Size



ON-SITE SERVICE / SERVICE PROVISION

TESTS/ SERVICES



We offer:

- Dynamic clamping force measurements
- Dynamic balancing
- Chuck repairs and installations with assembly
- Jaw coating
- 3-D measurements on our Zeiss CNC measuring machine
- Chuck repairs
- Installations with assembly of the clamping device
- Final inspection on our hydraulic test bed

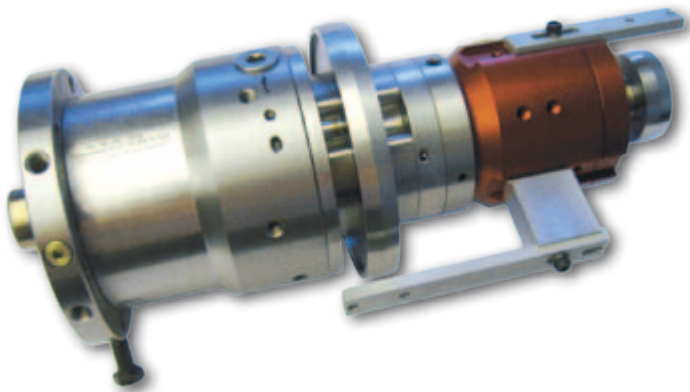
Even on-site
Other manufacturer's
equipment
possible upon agreement



INTEGRATION OPTIONS

Application:

- Flanges
- Cylinders
- Draw tubes
- Rotary distributor
- Multichannel feed
- Clamping cylinder for rotational speeds up to 8000 1/min
- Zero point clamping systems



- Double piston clamping cylinder with a flanged rotary distributor
- Positioning control via sensors
- High rotational speeds and pressures possible



HIGH-PERFORMANCE LUBRICATION PASTE

SAV 269.98

Application:

To ensure a long working life and a low level of clamping pressure loss, it is essential that the SAV-HSW special chucks are maintained at regular intervals. We recommended the use of our high-performance lubricating paste (TP42/OKS 265/1 SAV) to lubricate the chucks and to grease the individual parts (after dismantling and cleaning).

- 1 kilogram container
- Application using a brush or cartridge gun
- Long-term protection
- Excellent lubrication properties
- It even adheres at high rotation speeds
- Economical to use with a high coverage level
- Special recipe



A clamping pressure loss of up to 40% in poorly maintained chucks!

Ordering example:

High-performance lubrication paste SAV 269.98
Designation SAV - No.

CHAPTER OVERVIEW

CHAPTER 6

Pages 85 - 94

VACUUM WORKHOLDING

	SAV-ART.-NO.	DESCRIPTION	COMMENTS	PAGE
	249.40	Vacuum sintermetal round clamping plates	Suitable for almost all materials Particularly suitable for extremely thin and fragile workpieces	86
	249.42	Vacuum circular grid chucks	With a radial grid To clamp disc and ring shaped Workpieces	87
	249.70	Vacuum rotation joint	For circular vacuum chucks	88
	249.71	Vacuum fluid separator	For coolants and lubricants	89
	249.72	Modular vacuum compressor	Low wear and low maintenance pump No additional fluid separator required	90
	249.73	Vacuum auxiliary storage	To extend the vacuum storage capacity	91
	249.74	Vacuum safety switch		
	249.90	Vacuum workholding accessories	For vacuum workholding systems	92
	249.90	Vacuum sealant materials and accessories	For use with vacuum clamping plates	93

VACUUM SINTER METAL ROUND CLAMPING PLATES

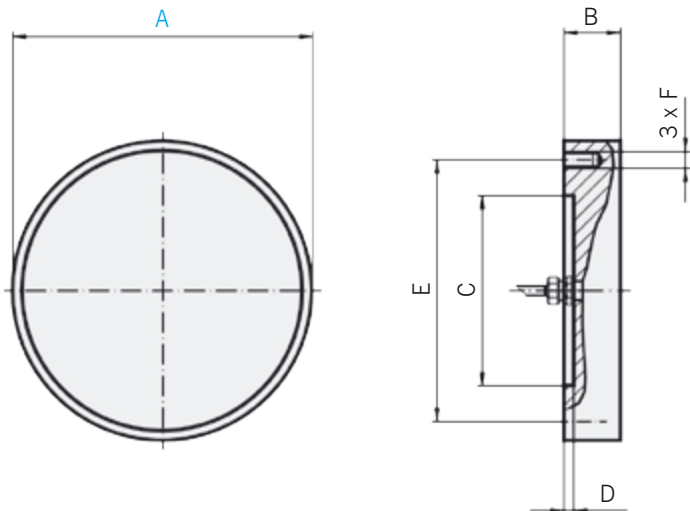
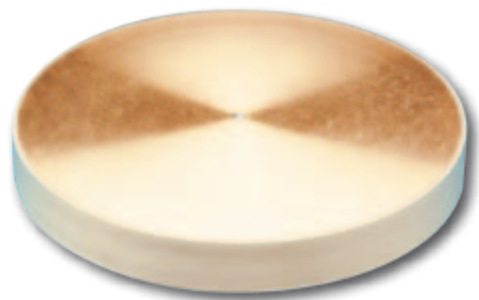
Sinter metal clamping plates for almost all materials

Application:
Particularly suitable for extremely thin and fragile Workpieces (e.g. thin glass, ceramics, plastics, tungsten Carbide). No deformation of the parts.

Features:
Sinter metal coating; Clamping plate rear side with thread and centering according to DIN 6350.
Available in high-tensile aluminium F 47 (A) or in steel(S). The steel format is only suitable for dry-working.
Parallelism: 0,02 / 100 mm
Evenness: 0,02 / 100 mm

Special sizes and formats available upon request.

Vacuum circular chuck with air permeable, fine pored and very homogenous, aluminium alloy inlays for deformation-free clamping of the very thin materials and foils. Available upon request.



Dimensions in mm						Weight Alu in kg	Weight steel in kg
A	B	C	D	E	F		
100	38	70	3	83	M 8	0,8	2,3
125	38	95	4	108	M 8	1,3	3,5
160	38	125	4	140	M 10	2,0	6,0
200	38	160	4	176	M 10	3,0	9,0
250	38	200	5	224	M 12	5,0	14,5
315	48	260	5	286	M 16	10,0	29,0
400	48	330	5	362	M 16	16,0	47,0
500	58	420	5	458	M 16	31,0	89,0
630	58	545	7	586	M 16	49,0	142,0

Ordering example:
Vacuum sinter metal round clamping plate
Designation SAV-No. - A - Format

VACUUM CIRCULAR GRID CHUCK

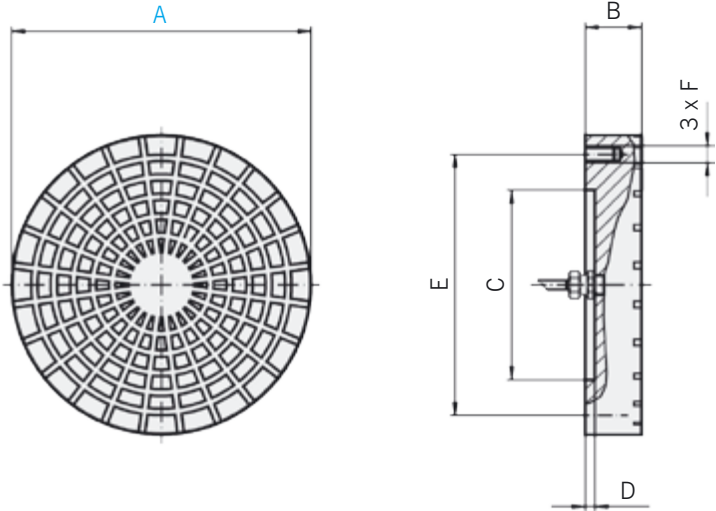
With radial grid

Application:
With this circular vacuum chuck, disc and ring shaped Workpieces can be clamped, for instance on lathes. Particularly suited for glass and plastic processing.

Delivery scope:
- 10 m seal for 38 mm plate height
- 20 m seal for plate heights from 48 mm

Available in high-tensile aluminium (A) or steel (S).

Circular vacuum grid chucks are available in custom-made formats for workpiece-specific clamping operations.



Dimensions in mm						Grid size	Weight Alu in kg	Weight steel in kg
A	B	C	D	E	F			
100	38	70	3	83	M 8	10,0	1,0	2,0
125	38	95	4	108	M 8	10,0	1,0	3,0
160	38	125	4	140	M 10	10,0	2,0	6,0
200	38	160	4	176	M 10	10,0	3,0	9,0
250	38	200	5	224	M 12	10,0	5,0	14,0
315	48	260	5	286	M 16	12,5	5,0	14,0
400	48	330	5	362	M 16	12,5	16,0	47,0
500	58	420	5	458	M 16	12,5	31,0	89,0
630	58	545	7	586	M 16	12,5	49,0	142,0

Ordering example:
Vacuum circular grid chuck
Designation SAV-No. - A - Format

VACUUM ROTATION JOINTS

for circular vacuum chucks

Vacuum rotation joints

For use with:

- Circular vacuum chucks on lathes with a hollow spindle
- Vacuum chucks on a rotating machine table with a hollow spindle

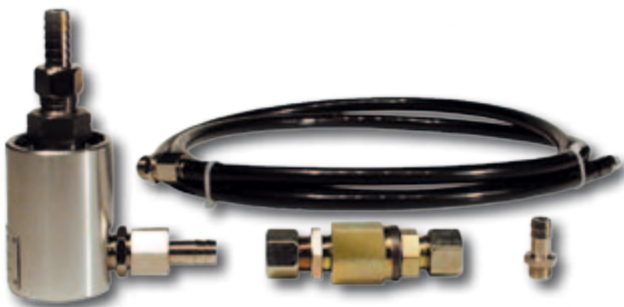
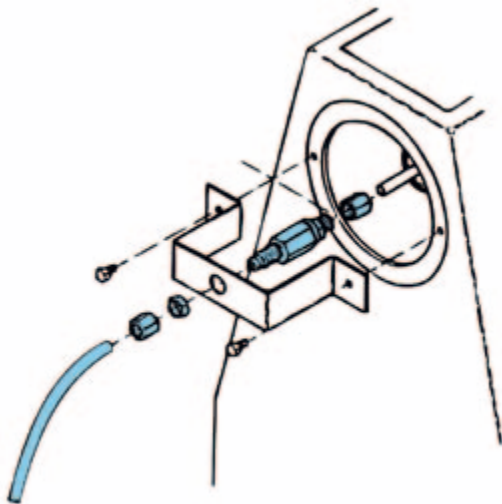
The vacuum rotation joint allows the rotary movement of the vacuum plates / circular vacuum chucks connected to a stationary vacuum supply without any vacuum loss.

Standard rotation joints are available for three rotation ranges: up to 1500, 3000 and 6000 1/min.

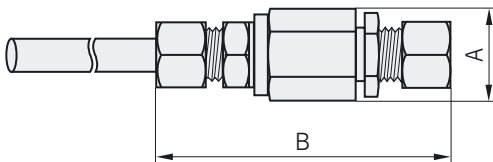
The rotation joints are supplied with a plastic tube. The plastic tube connects the chuck with the rotation joint through the hollow spindle. The tube transmits the torque forces.

Delivery scope:

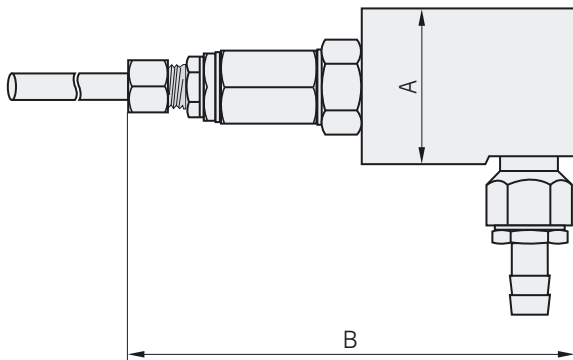
- 1.5 m tube
- Connection parts



Type A



Type B



Type	max.RPM	Dimensions in mm		Weight ca. in kg	Connection in inches
		A	B		
A	1500	35	85	0,3	R 3/8" - R 3/8"
B	3000	50	110	1,0	R 1/2" - R 3/8"
B	6000	50	110	1,0	R 1/2" - R 3/8"

Ordering example:

Vacuum rotation joint
Designation SAV 249.70 - 1500
SAV-No. - max. RPM

SAV 249.70

VACUUM FLUID SEPARATOR

Fluid separators are essential in systems which employ coolants and lubricants.

Application:

Installed between the vacuum plate and the vacuum compressor. Draining is performed manually.

- For the retention of swarf, shavings, fluids and operational residues
- Easy use due to its light weight
- Directly observable fluid level

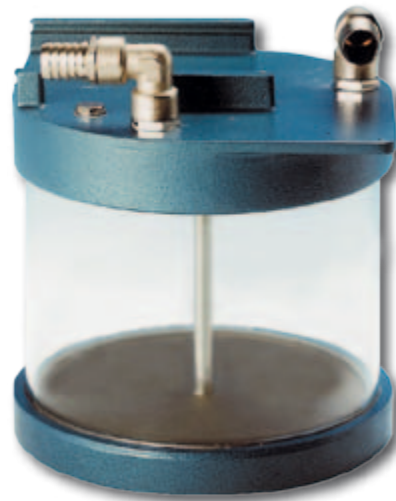
Delivery scope:

- With 2 hoses of 0.5 m each
- Hose couplings

Automatic fluid separator
available upon request



Contents: 5 l



Contents: 21 l

Volume in l	Dimensions in mm		Connection diameter	Weight in kg
	Diameter	Height		
5	200	400	LW 12	4,0
21	300	500	LW 32	10,0

Ordering example:

Vacuum fluid separator
Designation SAV 249.71 - 5
SAV-No. - Volume

MODULAR VACUUM COMPRESSOR

Generates vacuum pressure for coolant and lubricant feeds

Features:

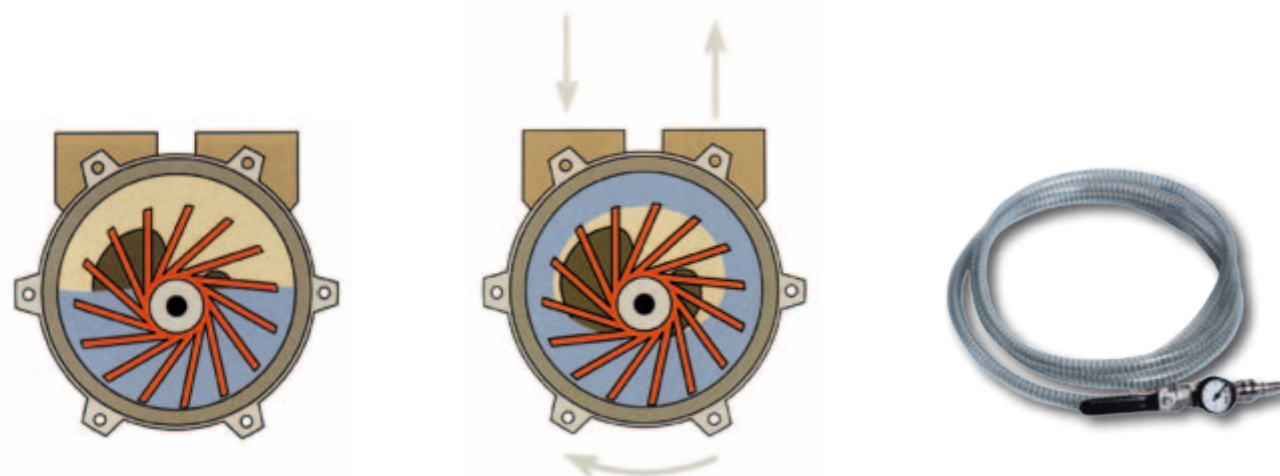
These robust, low wear and low maintenance pumps produce an operating vacuum of up to 50 mbar and do not require an additional liquid separator.

In operation, the water contained in the pump is swirled in to a ring form by a fast rotating impeller and serves to seal the contactless running impeller. A re-cleanable polyester filter and a patented condenser are installed to clean the incoming air supply before it enters the pump.

The discharged lubricant is re-introduced into the operating fluid circulation system and a valve enables the removal and return of excess fluid to the machinery during operation. Air cooling protects the compressor from overheating.

Delivery scope:

- 1 connection unit comprised of:
- 2 m Vacuum tubing
- 3/2-way manual valve with air vent
- 1 Vacuum gauge



Size	Suction capacity in m³/h	Motor drive in V/kW	Dimensions H x B x L
VW - 22	22	400 V, 50/60 Hz, 0,83 / 1,06 kW	463 x 432 x 602
VW - 45	45	400 V, 50/60 Hz, 1,20 / 1,60 kW	515 x 572 x 743
VW - 65	65	400 V, 50/60 Hz, 2,40 / 3,50 kW	515 x 572 x 743
VW - 100	100	400 V, 50 Hz, 3,85 kW	525 x 620 x 920
VW - 150	150	400 V, 50 Hz, 4,0 kW	710 x 845 x 1100
VW - 198	198	400 V, 50 Hz, 5,5 kW	710 x 845 x 1100
VW - 232	232	400 V, 50 Hz, 7,5 kW	710 x 845 x 1100

Replacement part:
Air filter element 3 µm,
Re-cleanable

Size	For suction capacity in m³/h
VW - L - 22	22
VW - L - 45	45 - 100
VW - L - 150	150 - 198
VW - L - 232	232

Ordering example:

Modular vacuum compressor SAV 249.72 - VW - 45
Designation SAV-No. - Size

SAV 249.72

VACUUM AUXILIARY STORAGE

for the relief of the vacuum compressor

Application:

The auxiliary storage serves to extend the vacuum storage capacity of the vacuum compressor. This enables more vacuum to be stored for a longer period which means the vacuum pump switching intervals can be extended and the clamping times reduced.

Features:

The auxiliary storage functions as an additional filter or separator and is equipped with two glass gauges to enable the level of the collected dirt or liquids to be monitored before draining.



Volume in l	Dimensions in mm			Connection in inches	Weight in kg
	L	B	H		
54	555	315	325	Tapped thread R 3/4"	18
210	800	500	530	Tapped thread R 3/4"	30

Ordering example:

Vacuum auxiliary storage SAV 249.73 - 210
Designation SAV-No. - Volume

SAV 249.73

VACUUM SAFETY SWITCH

Ensures safety through machine interlocking

Safety regulations require that machines with power actuated clamping devices are set in such a way that machine drive (e.g. the drive spindle or the table shift) can only be switched on after the clamping process has been completed.

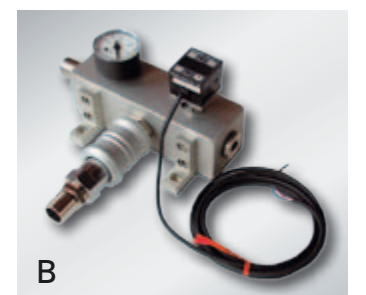
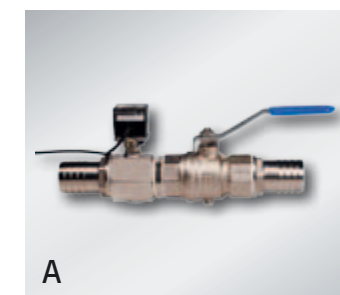
The safety interlock is a requirement for all powerful machine tools and can be integrated into the machine control system. An optical signal is generated if the vacuum level (stagelessly variable) falls below the preset minimum. The in-built, potential-free, two-way contact can be integrated into the machine control system and can e.g. trigger an emergency stop (spindle stop, table shift stop, full machine stop).

The switching range between the minimum and maximum vacuum levels can be stagelessly adjusted. If a magnet valve is utilised, the clamping process can be controlled directly from the machine control panel.

Ordering example:

Vacuum safety switch SAV 249.74 - 105
Designation SAV-No. - Size

SAV 249.74



Size	Description	For inside tubing-ø in mm	Voltage U in V	Type
100	Safety control with an electronic vacuum switch	12	24	A
105	Safety control with an electronic vacuum switch	18	24	A
110	Safety control with an electronic vacuum switch	18	24	B
115	Safety control with an electronic vacuum switch	25	24	A
120	Safety control with an electronic vacuum switch	32	24	A



ACCESSORIES – VACUUM WORKHOLDING

SAV 249.90

A comprehensive range of accessories is available for our vacuum workholding systems.

Examples:

SAV 249.74 - 200 Vacuum switch, electronic

For use as a safety switch with dry running vacuum pumps. The upper and lower threshold limits of the vacuum gauge can be preset. Dimensions 40 x 31 x 37 – 24 Volt



SAV 249.74 - 210 Vacuum switch, electronic

For use as a safety switch in wet and explosion-protected environments. The upper and lower threshold limits of the vacuum gauge can be preset. Dimensions Ø 33 x 92 – 24 Volt



Vacuum electro-magnet valve



Vacuum valve with manual slide connector



Quick-release coupling with external thread

Connector for the quick-release coupling



Hose connectors, hose couplings, reducing adaptors, double nipples etc, available upon request



VACUUM SEALANT MATERIALS AND ACCESSORIES

Accessories for use with vacuum grid chucks

Vacuum seal SAV 249.76

The neoprene seal is placed into the suction slot of the vacuum grid type chuck to restrict the clamping area. The seal diameter is dependent upon the cross section of the slot. If a plate is re-machined, then a seal with a smaller diameter should be selected.

Minimum seal length: 50 m

When ordering please state the **length** in m.

SAV-No.	Diameter in mm
249.76 - 20	2,0
249.76 - 30	3,0
249.76 - 35	3,5
249.76 - 40	4,0
249.76 - 45	4,5
249.76 - 50	5,0
249.76 - 55	5,5
249.76 - 60	6,0
249.76 - 65	6,5
249.76 - 70	7,0
249.76 - 80	8,0
249.76 - 100	10,0



Ordering example: Vacuum seal SAV 249.76 - 100 - 50
Designation SAV-No. - Länge

Vacugrease SAV 249.79

For the occasional greasing of suction tubing and strain relievers. Brush-on sealant for workpieces with rough and scored surfaces.

Container, contents 250 g

Ordering example: Vacugrease SAV 249.79
Designation SAV-No.

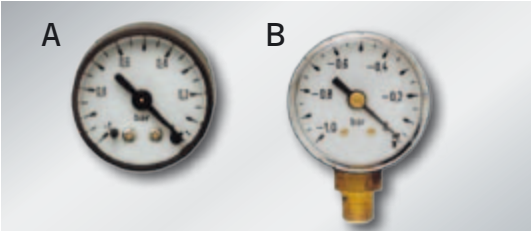
Vacuum hoses SAV 249.83

Wire spiral hose Type A: 13 / 8 diameter
Wire spiral hose Type B: 18 / 12 diameter
Wire spiral hose Type C: 25 / 18 diameter
Wire spiral hose Type D: 34 / 25 diameter

When ordering please state the **length** in m.

Ordering example: Vacuum hose SAV 249.83 - A - 10
Designation SAV-No. - Type - Length

Vacuum dial gauges



Type	Connection thread	Diameter in mm	Scale range
A	R 1/8" axial	40	0 bis -1 bar
B	R 1/8" radial	40	0 bis -1 bar

Upon request.

Manually operated lever valve with air vent



Connection thread	Type
1/4" Internal	14
3/8" Internal	38
1/2" Internal	12
3/4" Internal	34
1" Internal	10

Upon request.

Manifold



Delivery scope:

- Hose connector for vacuum pumps - Inlet
- Hose connector for 3/2-way manually operated vacuum lever valve with air vent for each outlet
- Vacuum gauge

Outlets and connections according to your specifications upon request.

CONDITIONS OF SALE AND DELIVERY

General Terms and Conditions of Business

§ 1 General/application

1. The General Terms and Conditions shall govern all present and future business relations.
2. In the sense of these general terms an entrepreneur is a natural person or legal entity or partnership with legal capacity with whom business relations are entered into and who acts in execution of a trade or self-employed occupational/professional activity.
3. Any diverging, opposing or supplemental General Terms and Conditions shall not be part of a contract, even if known, unless their application is expressly agreed to in writing.
4. The customer may neither assign nor pledge any contractual rights without our consent.
5. These provisions shall be construed and applied in accordance with the laws of the Federal Republic of Germany. The provisions of the Convention on Contracts for the International Sale of Goods shall not be applied.

§ 2 Conclusion of Contract/delivery

1. Our offers are subject to confirmation. Any technical changes, changes in form, colour and/or weight are reserved in the scope of being reasonable.
2. With the order of a product the customer declares bindingly that he wants to acquire the product ordered. We shall be authorized to accept the contract offer in this order within two weeks after receipt in our company. The acceptance may be declared in writing or by delivering the product to the customer.
3. The contract shall be concluded subject to our being supplied by our suppliers correctly and in time. This shall only apply if the failing supply is not our fault especially in the case of a congruent hedging transaction with our supplier.
4. Any events of force majeure such as strike, closing down of a plant, operational breakdown, vehicle or container defects, rail or flight closures as well as in the supply of the required raw material and other unforeseen causes release us from the supply obligations entered into. Any times of delivery shall only be considered as approximate and shall only begin after the final written confirmation of the order. The customer shall be informed immediately about the non-availability of the performance. Any counter-performance shall be immediately refunded.
5. Our deliveries shall be made cost unpaid on account and risk of the purchaser without any liability concerning destruction, breakage, theft and similar events. The same shall apply in case of any free deliveries. Especially the risk of breakage shall not be enclosed.
6. The costs of packaging and any transport insurance required by the purchaser shall be at his costs.
7. Any information in our drawings, pictures, measure, weights and other tables shall only be approximate units unless not expressly confirmed by us. The material which is part of our offers shall remain our property, it shall be subject to copyright and may not be revealed to third parties or only with our written agreement.

§ 3 Passing of the risk

1. As far as nothing else can be seen from the order confirmation, delivery "ex works" is agreed.
2. If the customer desires we shall cover the delivery by a transport insurance. Any costs in this respect shall be paid by the customer.

§ 4 Price and payment

1. Our prices are based on the cost situation at the time of passing the order.
2. All prices are ex works including loading in the plant excluding packaging, freight, insurance, assembly and other ancillary costs. All and any newly introduced or changed levies, any increase in freight and customs, value added tax, material prices and wage increases after the conclusion of the business transaction shall be at the customer's expense. In case of any additional repeat orders the prices shall be agreed upon again.
3. In case of any advance payment or payment on loading as well as in case of payment 14 days from the invoice date we grant 2% discount and 30 days from the invoice date our invoices are payable without any deduction. Any invoices for repair work and spare parts are payable immediately without deduction.
4. If after the conclusion of the contract we learn of any circumstances which justify doubts into the creditworthiness of the purchaser we may withdraw from the contract, request advance payment or make our delivery dependent on a security. This shall also apply if due claims are not settled despite reminders.
5. The customer may only offset with acknowledged or legally effective counter claims. He may retain payments only for reasons based on the same contract transaction.
6. Bills of exchange and cheques shall only be accepted on account of performance. Bills only after prior agreement. Any charges shall be paid by the purchaser.

§ 5 Delay in payment

1. In the event of a delay in payment by the purchaser all our claims existing against him shall be due for payment in cash irrespective of any accepted bills of exchange or periods for payment granted. The purchaser may not sell the goods in our ownership or co-ownership and is obliged to provide securities for us. The authorization to collect claims ceded to us ends.
2. The customer undertakes to pay the purchase price after the goods were received within thirty days from the invoice date. After this period the customer is in default. The entrepreneur has to pay default interest during the period of default on the claim in the amount of 8% above the base interest rate. We reserve the right to prove a higher default damage and to assert it against the entrepreneur.

§ 6 Warranty

1. If there are any defects in the goods we shall in our discretion first grant warranty to the entrepreneur by subsequent improvement or replacement delivery at our seat of business or the German seat of the entrepreneur. The entrepreneur bears the costs for the transport back or the transport back to Germany from abroad to his German seat. If the alternative performance fails, the customer may in general at his option request the lowering of the payment (reduction of purchase price) or the withdrawal from the contract (contract revocation). However, in case of only a minor contractual non-conformity especially only in case of any minor defects, the customer shall not be entitled to withdraw from the contract.
2. Entrepreneurs must notify us in writing of any obvious defects within a period of two weeks after the receipt of the goods otherwise the assertion of the warranty is excluded. For the keeping of the period the sending of the notification in time shall be sufficient. The entrepreneur shall be responsible for the full burden of proof of all claim requirements especially concerning the defect itself, the time of stating the defect and the timeliness of the notification of defects. Any hidden defects shall be made known immediately after they were found in writing otherwise the assertion of the claim shall be excluded. If a purchaser keeps any goods delivered by us despite any recognizable defects any warranty shall fail.
3. If a customer chooses the withdrawal from the contract for any legal or material defects after failed alternative performance, he shall not be entitled to any additional damages because of this defect. If the customer chooses damages after the failed alternative

performance, the goods shall remain with the customer if this is reasonable to him. The damages shall be restricted to the difference between purchase price and value of the defective good. This does not apply if we caused the contractual violation fraudulently.
4. For entrepreneurs the warranty period is one year after the delivery of the good. This does not apply if the customer did not notify us of the defect in due time (§ 6 item 2 of the provisions).
5. If a damage is found on the arrival of the delivery the recipient must have this confirmed immediately on the consignment note. In case of delivery by lorry a record has to be written stating exactly the scope of the damage. This record has to be signed by the driver. The terms and conditions of our insurance company shall be decisive for any compensation.
6. In case of payment default or credit revocation we may refuse warranty until the purchaser complied with his obligation to pay in the scope corresponding to the value of our delivery minus any reduction of the purchase price in the amount of the existing defects.
7. There shall be no warranty for any damage caused by the following:
Unsuitable or improper use, defective installation by the purchaser or third parties, natural wear and tear, defective or negligent treatment, defective construction works or unsuitable construction ground, as far as they are not attributable to our fault.

§ 7 Withdrawal of the customer and other liability on our side

1. The legal right of the customer to withdraw from the contract shall neither be excluded nor limited apart from the cases of § 6. Neither shall any legal or contractual rights and claims we are entitled to be excluded or limited.
2. We only grant unlimited liability for intent and gross negligence (also on the part of our legal representatives and assistants in performance) as well as for damage from the violation of life, body or health which is based on a negligent violation of duties on our part or an intentional or negligent violation of duty of our legal representatives or assistants in performance.
We also grant unqualified liability in granting warranties and assurances if a defect in connection with this triggers our liability. There shall be no restrictions in the liability from any endangering facts (especially according to the law on product liability). Any liability according to the principles of recourse of the entrepreneur according to § 478 f BGB shall remain unaffected.
3. In case of any other culpable violation of essential contractual duties (cardinal duties) our remaining liability shall be limited to the contract-typical foreseeable damage.
4. Furthermore, any liability irrespective of the legal grounds (especially claims from the violation of contractual main and ancillary duties, unauthorized acts as well as other tortious liability) – shall be excluded.
5. The same (exclusions, limitations and exceptions thereof) shall apply to claims from negligence on the conclusion of the contract.
6. In case of the compensation for necessary expenses (with the exception of the one according to §§ 439 sub-sect. 2, 635 sub-sect. 2 BGB) this § 7 shall apply accordingly.
7. Any exclusion or limitation of our liability shall also be effective for our representatives and assistants in performance.
8. Cardinal duties are essential contractual duties i.e. such duties which give the contract its character and which the contract partner may rely on; these are therefore essential rights and duties which create the requirements for the performance of the contract and are indispensable for the reaching of the contract purpose.
9. None of the above clauses is intended to change the legal or judge law distribution of burden of proof.

§ 8 Retention of title

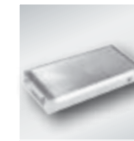
1. We retain title to the goods until receipt of complete payment of all claims from the current business transaction with the entrepreneur.
2. The customer is obliged to take good care of the goods. As far as any maintenance and servicing work is necessary the customer has to perform this regularly at his own costs.
3. The customer is obliged to notify us immediately of any attachment by third parties of our goods as in the case of seizure and any damage or the destruction of the goods. The customer must immediately notify us of any change of ownership concerning the goods as well as his own change of residence.
4. We shall be authorized to withdraw from the contract in case of contract non-conformity on the customer's part especially in case of delay of payment or in violation of a duty according to items 2 and 3 of this provision and to demand the return of the goods.
5. The entrepreneur shall be authorized to sell the goods in orderly business. He already now assigns all claims in the amount of the invoice amount to us which he receives from the reselling against any third party. We accept his assignment. After the assignment the entrepreneur shall be entitled to collect the claim. We reserve the right to collect the claims ourselves if the entrepreneur does not meet his payment obligations in due course or is in default.
6. The processing and use in manufacturing of the good by the entrepreneur shall always be made in our name and on order for us. If any processing is done with objects not belonging to us we acquire co-ownership into the new object in the relation of the value of the good delivered by us to the other objects used. The same applies if the good is mixed with other objects not belonging to us.
7. As far as purchase price claims of the customer are part of a current account the customer assigns any balance claim he is entitled to to us in the same way.
8. If we provide the means for the purchase price payment for the customer by way of indorsing a bill of exchange issued by us and accepted by him for discount (bill-cheque-procedure) the title to the product shall only pass to the customer once the bill has been honoured and our bill liability has ended.

§ 9 Place of performance and venue

1. As far as nothing different results from the order confirmation our seat of business is place of performance. We have the right to also file an action with the court having jurisdiction for the purchaser or any other court which may have jurisdiction according to national or international law.
2. If the customer is a merchant, governmental entity or special governmental estate the exclusive place of jurisdiction for all actions from this contract shall be the court having jurisdiction for our seat of business. The same applies if the customer does not have a general venue in Germany or his domicile or usual residence is unknown at the time of filing the claim.
3. If any of the provisions of a contract with the customer including these General Terms and Conditions shall be or become invalid in total or in part, all other provisions hereof shall remain in full force and effect. The provision invalid in total or in part shall be replaced by a provision the economical effect of which is as near as possible to the one of the invalid provision. This shall also apply in the case of any omissions in the contract.

December 2010

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



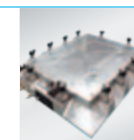
CATALOGUE V: SAV-STANDARD PARTS

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



CATALOGUE X: SAV-QMC

Mould holding and changing systems for injection moulding and presses



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