

Type D-VARIO

Diaphragm chuck
FLEXIBLE MODULAR SYSTEM

Main dimensions and technical data



Application/customer benefits

- Flexible solution for grinding with quick adjustment for short set up times

Technical features

- Adjustable, modular jaw system for clamping different work pieces with the same jaws
- Key Lock System for quick positioning of the pitch of different work pieces
- Micrometer fine adjustment of the center line
- For small, medium and large batch sizes
- Workstop with medium feed for air sensing and integrated coolant nozzles optional
- Jaws for O.D. clamping (Type A) optional
- D-Vario Configurator: free application to configurate your set up (www.smw-autoblok.de/vario)

Standard equipment

Diaphragm chuck D-Vario (with mounting bolts)

Optional accessories in the modular system:

Pitch line clamping

- 6 different jaw sets for different outside diameters
- Key Lock System for different pitches of gears (see figure A, B and C)
- Clamping pins for different modules (Dia. of ball \varnothing 3,0 mm to 6,0 mm)
- Locators

O.D. clamping (Type A)

- 4 different jaw blanks for different outside diameters
- Factory finished jaws
- Locators

D-VARIO Configurator Software:



- Safe and quick configuration of all set-ups for different gears
- Web-APP: from anywhere with any device feasible (internet access needed)
- Availability for exporting all resolution of the results

With these free of charge D-VARIO Configurator you will be able to create individual configurations for different gears and set-ups. For input the data, there are only 3 steps needed.

Optional you could also make the interpretation of the work stop and the associated support bolts.

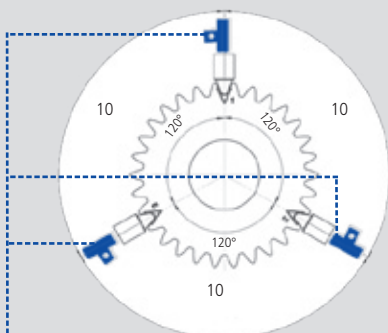
Through the integrated export function, the results can be saved at any time or transferred to a printer.

Start Web-App:

www.smw-autoblok.de/dvario

A: Number of teeth is divisible by 3

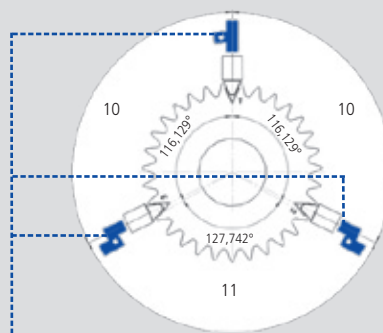
Example of application:
gear with number of teeth $[z] = 30$



- Specification of Key Lock System:
3x Key straight

B: Number of teeth is not divisible by 3

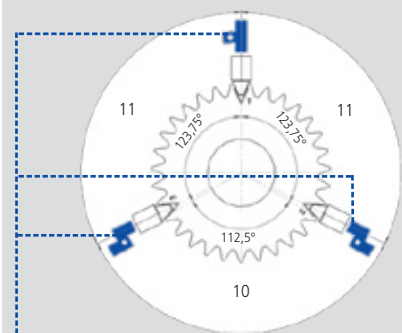
Example of application:
gear with number of teeth $[z] = 31$



- Specification of Key Lock System:
1x Key straight,
2x Key for number of teeth 31

C: Number of teeth is not divisible by 3

Example of application:
gear with number of teeth $[z] = 32$



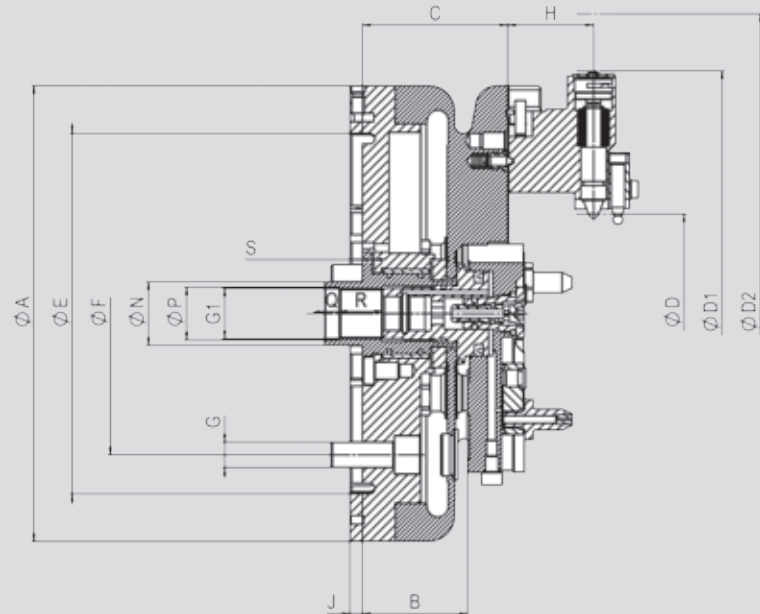
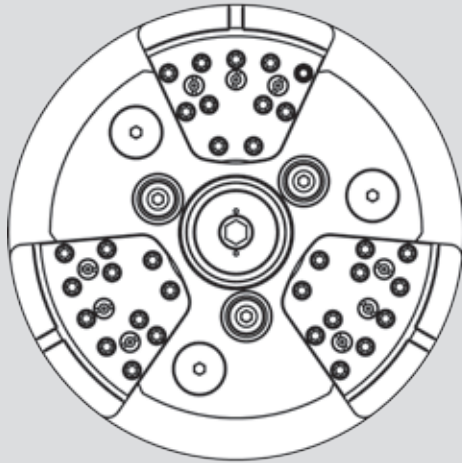
- Specification of Key Lock System:
1x Key straight,
2x Key for number of teeth 32

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Top jaws and locator base are optional.



Subject to technical changes
For more detailed information please ask for customer drawing.

SMW-AUTOBLOK Type			D-VARIO 215
Mounting			Z170
Id. No.			069100
	A	mm	215
Locating Face for Locator	B	mm	49.5
	C	mm	68.5
Clamping range min./max.	D	mm	24 - 144
Swing min.	D1	mm	215
Swing max.	D2	mm	264
	E	mm	170
	F	mm	133.4
	G		M12
	G1		M24x1.5
Jaw height	H	mm	40.5
	J	mm	6
	P H8	mm	25
	Q	mm	7
	R	mm	20
Piston stroke	S	mm	1.0
Jaw stroke at distance H		mm	0.95
Draw pull min./max.*		kN	0-15
Draw pull for chuck open		kN	15
Moment of inertia		kg·m ²	0.082
Weight without top tooling		kg	12.2
Recommended actuating cylinders	Type		SIN-DFR

* Additional draw pull to the diaphragm force actuated by the actuating cylinder

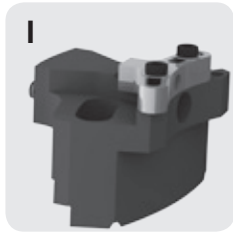
Advice: Please note: It is important, that the cylinder force for pushing and pulling can be set to different values independently!

Type D-VARIO

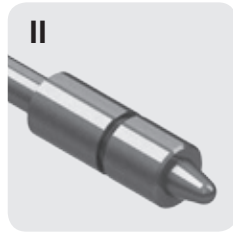
Diaphragm chuck
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■ Overview clamping kit

Configuration of the set up for pitch line clamping within only 5 steps:



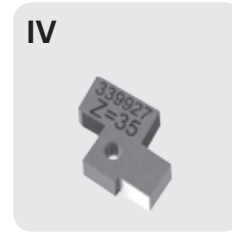
I
First you have to choose your matching top jaw (size 1 - 6) for the outside diameter [d_a] of the gear to be machined. Each size of top jaw can cover 20 mm outside diameter using two different types of clamping pins (Type A and B). One set of top jaw consists of 3 pieces including 1 straight Key Lock insert.



II
The determination of the spherical clamping pins is made according to the ball dimension of the gear. There are 2 types of clamping pins:
Type A for the first 10 mm of the clamping range of the top jaws.
Type B for the second 10 mm of the clamping range of the top jaws.



III
Optionally prelocator pins are available. Prelocator pins are used at automatic loading. The determination is made according to the clamping pins used.

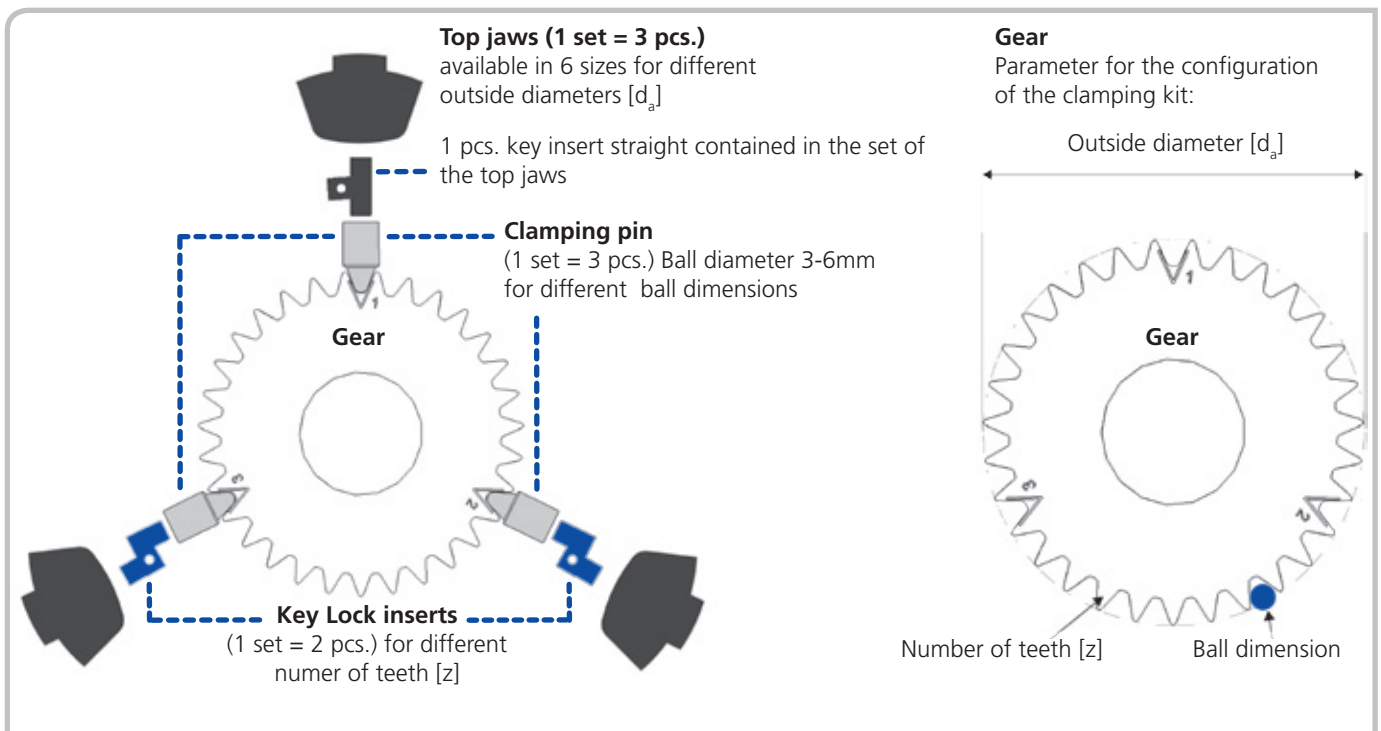


IV
One set of Key Lock insert consists of 2 keys. Gears, which number of teeth that is divisible by 3 can be machined with 3 of the same type Key Lock insert (straight). For all gears, which number of teeth is not divisible by 3, there are different key insert sets available according to the number of teeth. The Key Lock inserts are the same for all 6 sizes of top jaws.



V
The following types of locator bases are available:
Type A: without air sensing / without nozzle for coolant
Type B: without air sensing/with nozzle for coolant
Type C: with air sensing / with nozzle for coolant
The height of the locator posts is depending on the gear.

Overview of the clamping kit:



D-Vario Configurator

free application to configure your set up
www.smw-autoblok.de



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■ Configuration of the clamping kit

I. Determination of the top jaws

Top Jaws		Size	1	2	3	4	5	6
Outside diameter of gear	d_a	mm	24-44	44-64	64-84	84-104	104-124	124-144
Number of teeth	z	number	16-37	14-44	13-86	13-86	13-86	13-86
Inside clearance diameter of jaws		mm	46	68	88	108	128	148
Swing diameter		mm	164	184	204	224	244	264
Weight / set		kg	2.9	3.0	3.0	3.1	3.1	3.1
Order number / set of 3 pieces	Id. No.		630741	630742	630743	630744	630745	630746


Clamping pin Type		A	B	A	B	A	B	A	B	A	B	A	B
Clamping range	mm	24-34	34-44	44-54	54-64	64-74	74-84	84-94	94-104	104-114	114-124	124-134	134-144

II. / III. Determination of the clamping pins (and optional prelocator pins)







Clamping pin type	Set	Type A	Available prelocator pins	Type B	Available prelocator pins
Ball diameter \varnothing 3,0	Id. No.	630851	339835	630844	339843
Ball diameter \varnothing 3,5	Id. No.	630852	339836	630845	339844
Ball diameter \varnothing 4,0	Id. No.	630853	339837	630846	339845
Ball diameter \varnothing 4,5	Id. No.	630854	339838	630847	339846
Ball diameter \varnothing 5,0	Id. No.	630855	339839	630848	339847
Ball diameter \varnothing 5,5	Id. No.	630856	339840	630849	339848
Ball diameter \varnothing 6,0	Id. No.	630857	339841	630850	339849

Clamping pins


Clamping pin type A









Ball diameter
 \varnothing 3; 3,5; 4; 4,5; 5; 5,5; 6

	Top jaw 1	\varnothing 24-34 mm
	Top jaw 2	\varnothing 44-54 mm
	Top jaw 3	\varnothing 64-74 mm
	Top jaw 4	\varnothing 84-94 mm
	Top jaw 5	\varnothing 104-114 mm
	Top jaw 6	\varnothing 124-134 mm

Clamping pin type B



Ball diameter
 \varnothing 3; 3,5; 4; 4,5; 5; 5,5; 6

	Top jaw 1	\varnothing 34-44 mm
	Top jaw 2	\varnothing 54-64 mm
	Top jaw 3	\varnothing 74-84 mm
	Top jaw 4	\varnothing 94-104 mm
	Top jaw 5	\varnothing 114-124 mm
	Top jaw 6	\varnothing 134-144 mm

► **Clamping pin type A**
For the first 10 mm of the clamping range of the top jaws.

► **Clamping pin type B**
For the second 10 mm of the clamping range of the top jaws.

► **Compatibility**
All types and sizes of clamping bolts are compatible to all top jaws.

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■ Configuration of the clamping kit

IV. Key Lock inserts for different number of teeth of gears

Id. No. Key Lock insert for gears which number of teeth is not divisible by 3 (1 set = 2 pcs.)

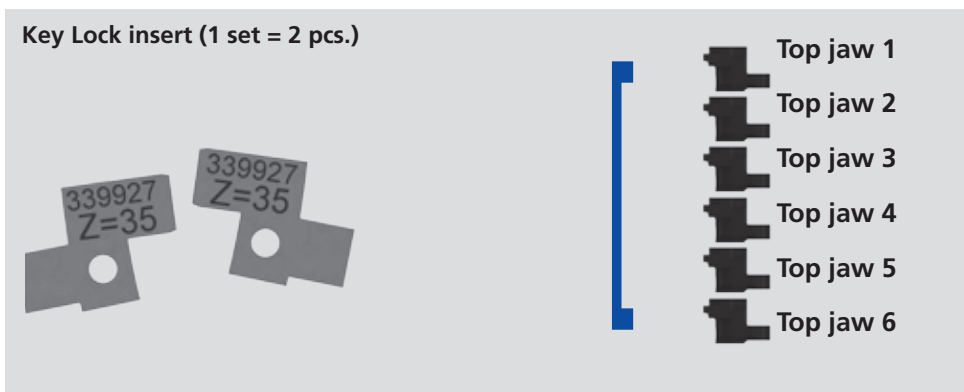
z = 10	z = 11	z = 13	z = 14	z = 16	z = 17	z = 19	z = 20	z = 22	z = 23
339911	339912	339913	339914	339915	339916	339917	339918	339919	339920
z = 25	z = 26	z = 28	z = 29	z = 31	z = 32	z = 34	z = 35	z = 37	z = 38
339921	339922	339923	339924	338725	339925	339926	339927	339928	339929
z = 40	z = 41	z = 43	z = 44	z = 46	z = 47	z = 49	z = 50	z = 52	z = 53
339930	339931	339932	339933	339934	339935	339936	339937	339938	339939
z = 55	z = 56	z = 58	z = 59	z = 61	z = 62	z = 64	z = 65	z = 67	z = 68
339940	339941	339942	339943	339944	339945	339946	339947	339948	339949
z = 70	z = 71	z = 73	z = 74	z = 76	z = 77	z = 79	z = 80	z = 82	z = 83
339950	339951	339952	339953	339954	339955	339956	339957	339958	339959
z = 85	z = 86								
339960	339961								

Id. No. Key Lock insert for gears which number of teeth is divisible by 3 (1 set = 2 pcs.)

straight
338724

Order Example:

- Gear with number of teeth 32 ▶ not divisible by 3 ▶ Id. No. 339925 (1 set = 2 pcs.)
 - Gear with number of teeth 33 ▶ divisible by 3 ▶ Id. No. 338724 (1 set = 2 pcs.)
- 1 straight Key Lock that comes with the chuck always remains in use.



- ▶ **Compatibility**
All Key Lock inserts are compatible to all top jaws.

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■ Configuration of the clamping kit

V. Locator base

Locator base

Determination of height of locator posts:
 Δ = Distance between clamping position and locating face
 Height of locator posts [H] = 32,5 mm - Δ

Clamping position = 1/2 serration length / at longer serrations it is the requested clamping position.
 In case the lowest face is not the locating face, please ask our customer service.

Locator base			Type A	Type B	Type C
Medium feed for air sensing			-	-	X
Nozzle for coolant			-	X	X
Locating diameter min.	D	min.	22	47	47
Locating diameter max.	D1	max.	136	136	136
Width	B	mm	27	27	27
Order Number		Id. No.	339860	339859	339858

Locator posts with contact face diameter [E] 2,5 mm	
Height[H] = 12,5 mm	339861
Height[H] = 15,0 mm	339862
Height[H] = 17,5 mm	339863
Height[H] = 20,0 mm	339864
Height[H] = 22,5 mm	339865
Height[H] = 25,0 mm	339866
Height[H] = 27,5 mm	339867
Height[H] = 30,0 mm	339868
Height[H] = 32,5 mm	339869
Height[H] = 35,0 mm	339870
Height[H] = 37,5 mm	339871
Height[H] = 40,0 mm	339872
Height[H] = 42,5 mm	339873
Height[H] = 45,0 mm	339874
Height[H] = 47,5 mm	339875
Height[H] = 50,0 mm	339876

I.D. Number is for one set (=3 pieces)

Locator posts with contact face diameter [E] 4,5 mm	
Height[H] = 12,5 mm	339877
Height[H] = 15,0 mm	339878
Height[H] = 17,5 mm	339879
Height[H] = 20,0 mm	339880
Height[H] = 22,5 mm	339881
Height[H] = 25,0 mm	339882
Height[H] = 27,5 mm	339883
Height[H] = 30,0 mm	339884
Height[H] = 32,5 mm	339885
Height[H] = 35,0 mm	339886
Height[H] = 37,5 mm	339887
Height[H] = 40,0 mm	339888
Height[H] = 42,5 mm	339889
Height[H] = 45,0 mm	339890
Height[H] = 47,5 mm	339891
Height[H] = 50,0 mm	339892

I.D. Number is for one set (=3 pieces)

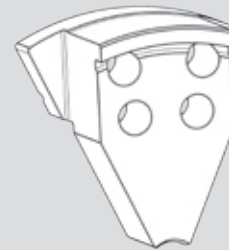
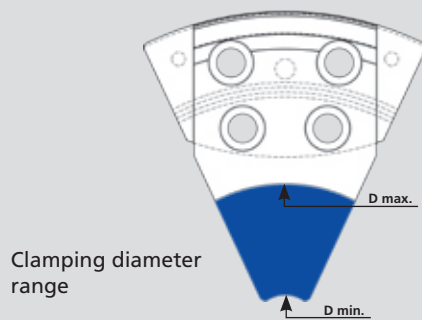
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■ Jaws type A for O.D. clamping

Jaws Type A

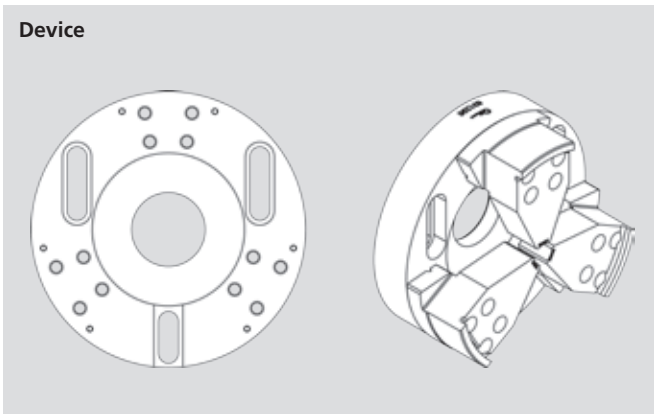
Jaws Type A (through hardened)



Jaws type A		1	2	3	4	5	6
Clamping Range \varnothing D min. - D max.	mm	20-40	40-60	60-80	80-100	100-120	120-140
Weight / set	kg	1,1	1,1	1,0	1,0	1,0	0,8
Blank jaws (set of 3 pcs.)	Id. No.	631484		631485		631486	631487
Jaws factory finished* (set of 3 pcs.)	Id. No.	631488	631489	631490	631491	631492	631493

* Jaws are factory finished according to the specified clamping diameter.
Note: The clamping diameter must be specified in case of order.

Device

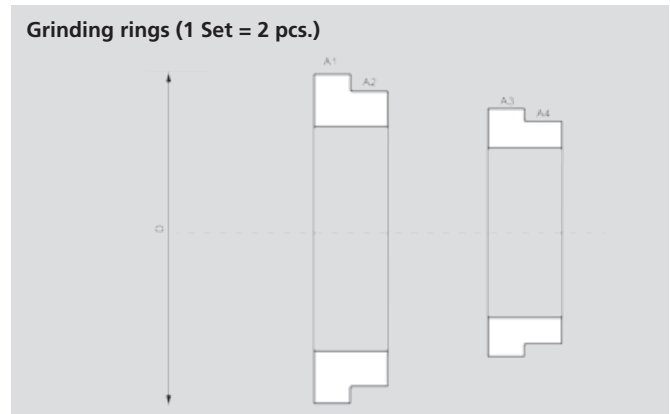


Device for machining of the blank jaws type A

Jaws type A sizes 1 - 6	631296
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The device is needed to pre-machine the blank jaws type A. Then, the jaws must be finish ground to the clamping diameter on the D-Vario chuck. For this operation, the jaws have to be clamped with the grinding rings.

Grinding rings (1 Set = 2 pcs.)



Recommended grinding rings

Jaws type A sizes 1 - 6	631309
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Grinding data

Grinding	A	D	residual jaw stroke
1. Grinding	A1	D = 177,0 mm	residual jaw stroke 0,25 mm
2. Grinding	A2	D = 176,9 mm	residual jaw stroke 0,20 mm
3. Grinding	A3	D = 176,8 mm	residual jaw stroke 0,15 mm
4. Grinding	A4	D = 176,7 mm	residual jaw stroke 0,10 mm

The clamping diameter A1 is used for the first finish grinding process. The smaller clamping diameter of the grinding rings (A2-A4) are used to regrind worn or damaged existing jaws.