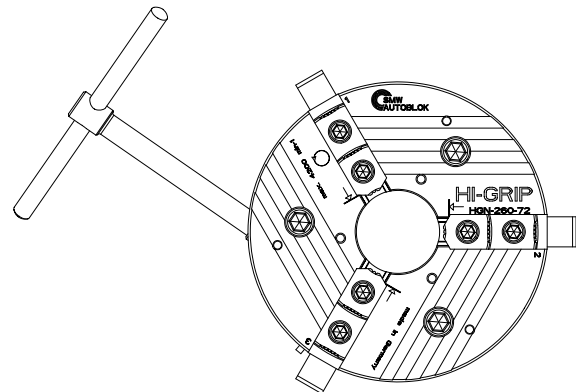


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SERVICE MANUAL HG-N

Thank you for purchasing an original SMW-AUTO-BLOK manual chuck type HI-GRIP.

This **service manual** contains the installation, the use and the maintenance instructions of the manual chuck type HI-GRIP (HG-N).

SMW-AUTOBLOK reserves the right to make **changes without notice**.

This **service manual may not be** - in whole or in part - **copied** without our written agreement.

The **service manual is a part of the manual chuck** and must be passed to the new owner in case of sale.



Please read this service manual carefully before installation and use and always follow the regulations.

Please note especially the sections which are marked with the following sign:



- Danger of injury or danger to life if instructions are not followed.
- Danger of damage to the machine, the manual chuck or the components.

Manufacturer's declaration

according to machine specification 89/392/EC appendix II paragraph B

SMW-AUTOBLOK Spannsysteme GmbH declares that the component described following is designed for the use on a machine. It is prohibited to install the component until it is certain that the machine in which the component will be installed, is in accordance with the regulations of the EG-rule i.d.F.91/368/EWG.

Component:	Manual chuck
Application:	Installation in machine tool
Type:	HG-N
Applied harmonized norms:	DIN EN 1550



Signature of responsible person

General safety instructions



1. Correct use

WARNING! SMW-AUTOBLOK manual chucks are designed for the clamping of workpieces on lathes/machine tools. Any other use can cause hazards. For any damages resulting herefrom SMW-AUTOBLOK is not responsible.



2. Personnel

WARNING! Manual chucks must be installed, operated and maintained only by qualified and regularly trained personnel.



3. Protections

WARNING! During machining the power chuck and the clamped component must be protected by safety guards. Open machine door only when machine spindle is completely stopped. Maintenance and actuation of the power chuck must only be carried out when machine spindle is stopped.



4. Max. speed

WARNING! The max. spindle speed is engraved on the chuck body. It must not be exceeded. The max. spindle speed is only valid at max. actuating force M_{dmax}. using standard hard stepped jaws. If, for special applications, special top jaws are used, clamping force and the max. speed must be calculated according to VDI 3106 but not exceeding the max. permitted values. Heavy special top jaws have especially a big influence on the max. speed. During the machining operation the centrifugal force increases or decreases the gripping force (O.D. clamping = decreasing, I.D. clamping = increasing). The calculated values should be measured with a dynamic gripmeter type DGM.



6. Remaining risks

WARNING! The type of components (shape, weight, unbalance, material etc.) has a big influence on the system "machine tool - manual chuck - component". For that reason there is always a residual risk. These residual risks must be calculated by the user and have to be eliminated by suitable actions.



7. Jaws

WARNING! Always use original SMW-AUTOBLOK base jaws and monoblock jaws. Jaws of other manufacturers can cause damage to the chuck or accidents. Top jaws must be mounted with head socket screws of the class 12.9 only. Tighten with the specified torque. Always ensure sufficient length of thread engagement (min. 1,25 x thread dia.)!

If the jaw height of special jaws exceeds the height of the standard jaws, the max. actuating force of the chuck must be reduced in order to avoid an excessive lever action and thus damage to the manual chuck. At reduced actuating force, the max. speed must also be reduced accordingly!



8. Jaw change

WARNING! The jaw is positioned min. as far to the marking on the chuck body that the serration of the wedge bar is fully engaged with the serration of the jaws. By turning the wrench the complete serration of the wedge bar is engaged into the serration of the jaws. The clamping can start if 60 % of the serration is engaged. This is indicated by the indicator pin on O.D. of the chuck. Never clamp or rotate the chuck with the indicator pin protruding!



9. Clamping

WARNING! Actuate the chuck with the original wrench. Do not exceed max. torque! Always remove wrench immediately after clamping! Do not leave wrench in the chuck! According DIN/EN 1550 the machine must be electrically locked against spindle start if the wrench is still in the chuck.

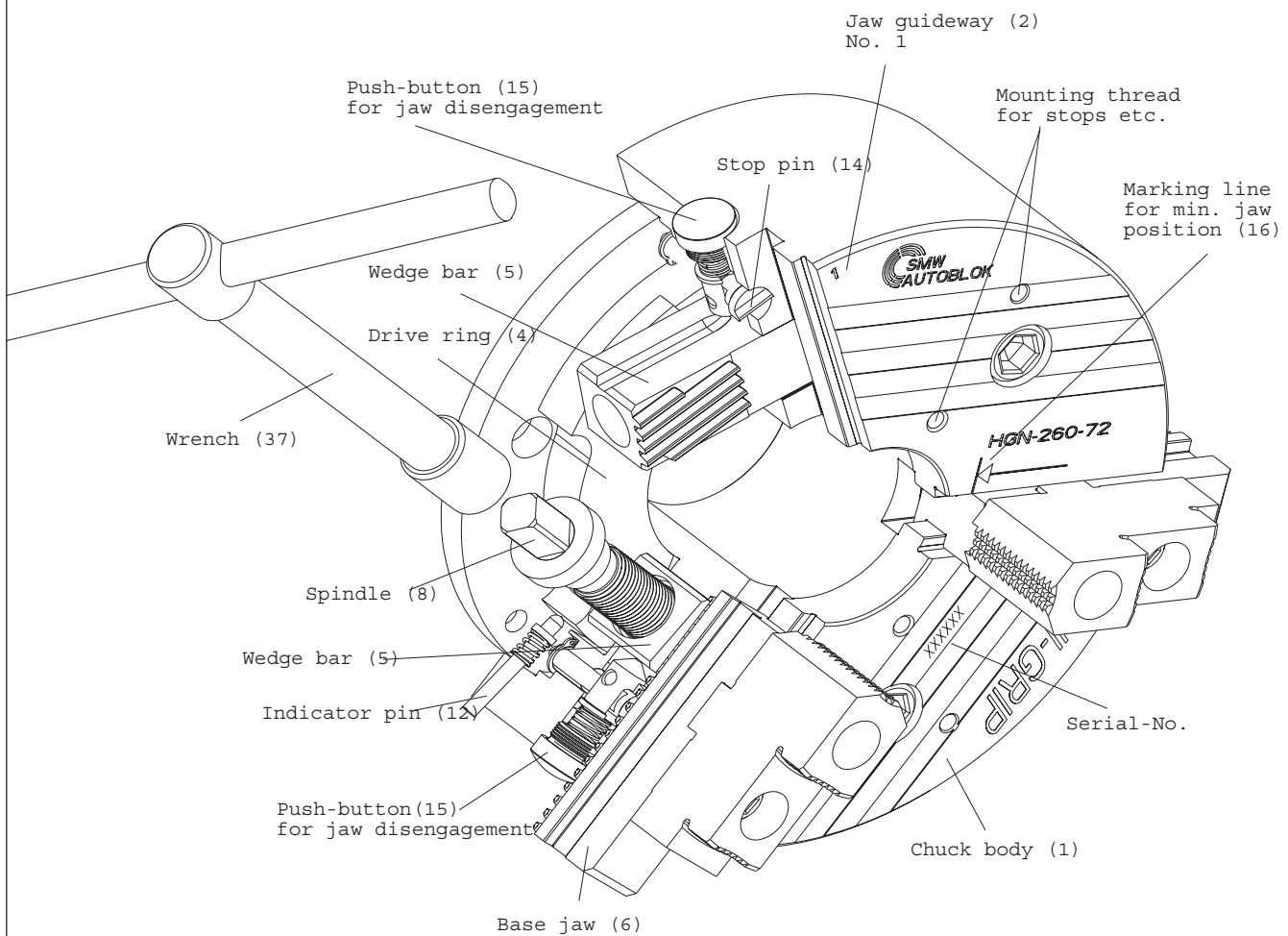
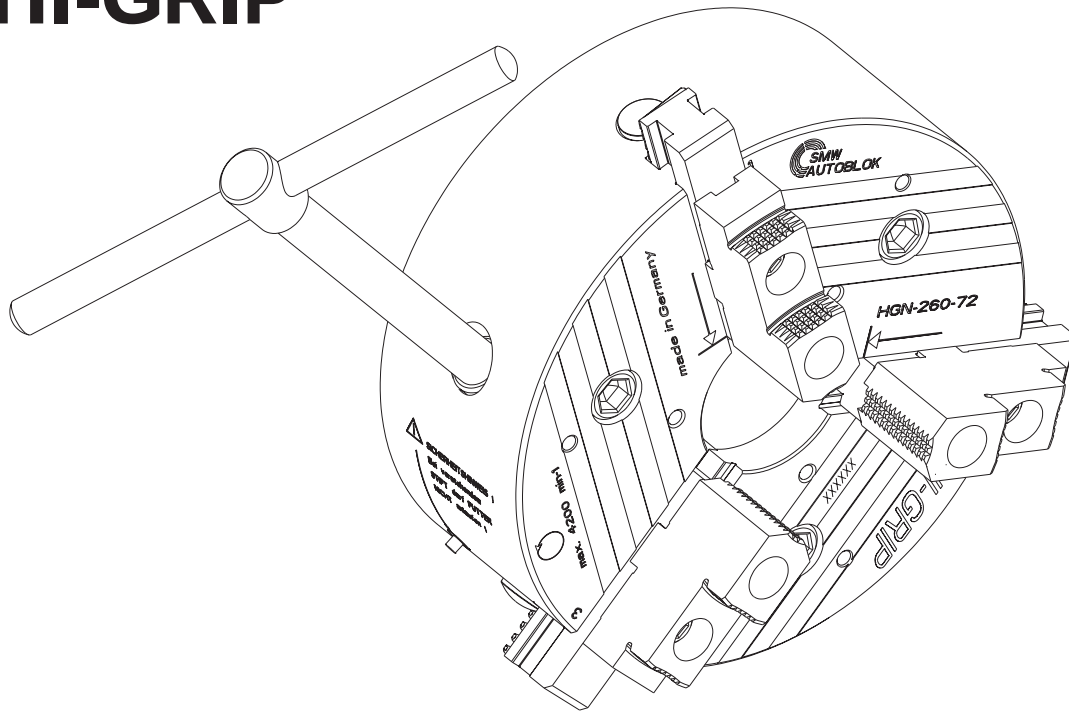


10. Maintenance

WARNING! The manual chuck must be maintained in regular intervals. Check the conditions by measuring the gripping force with static gripmeter. Replace damaged parts with original SMW-AUTOBLOK spare parts only. Maintenance must be carried out at safe spindle stop of the machine only.

For any problems or questions please contact SMW-AUTOBLOK directly or one of our authorized offices.

HI-GRIP



HI-GRIP:

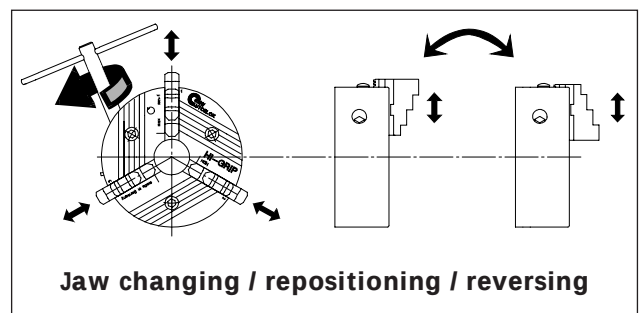
The precision manual chuck type HI-GRIP HG-N is designed for flexible manufacturing on NC-lathes. The unique wedge bar design guarantees highest gripping forces, repeatability, a constant high concentricity and a quick jaw change with accurate repositioning and reversing the jaws.

Function of the wedge bar drive

HG-N chucks are equipped with a wedge bar drive. The 3 wedge bars (5) in the chuck body are connected with the drive ring (4). The wedge bars are tangentially moved by the spindle (8) in a wedge angle to the jaw guideways (2). The serration of the wedge bars (5) is engaged into the serration of the base jaws (6) and drives the base jaws (6) in radial direction.

Jaw change/repositioning of jaws

By turning the wrench (37) counter-clockwise until the stop the wedge bars are tangentially shifted that the base jaw - wedge bar connection is released. The stop pin is retracted by actuating the push-button (15). The jaw (6) can be removed or re-positioned. The position of the wedge bars (5) is controlled via the indicator pin (12). If less than 60 % of the serration is engaged the indicator pin (12) is protruding from the chuck body. Turn the wrench (37) clockwise until the indicator pin is no more protruding. The chuck is now ready for clamping and workpieces can be clamped.

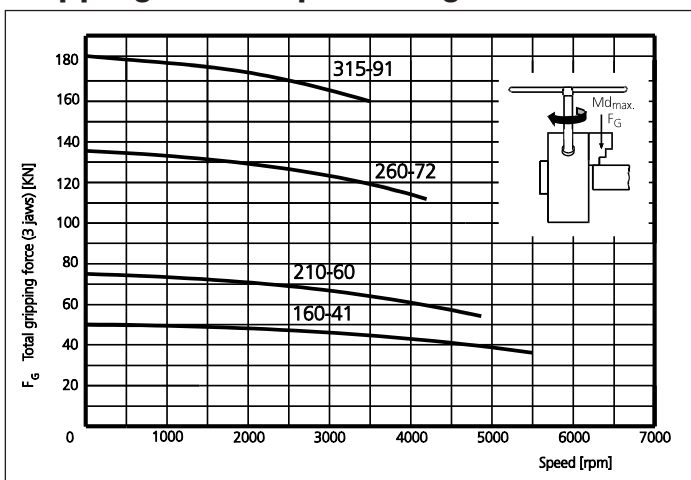


Never clamp or rotate the chuck with the indicator pin protruding!

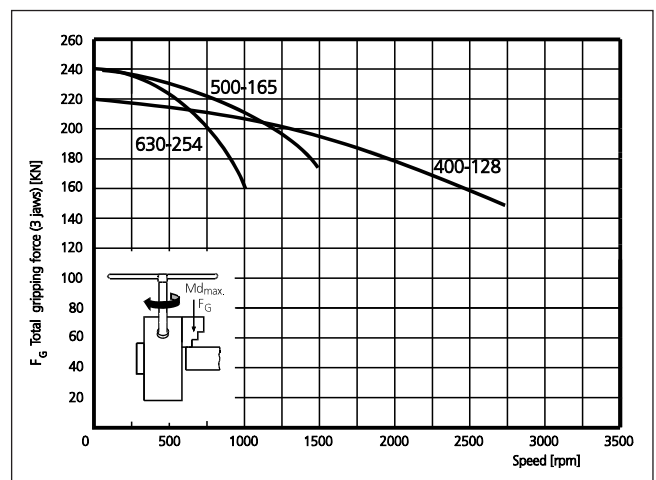


When inserting jaws please insert jaw at least to the marking (16) to ensure full engagement of the serration for a safe operation.

Gripping force - speed diagram

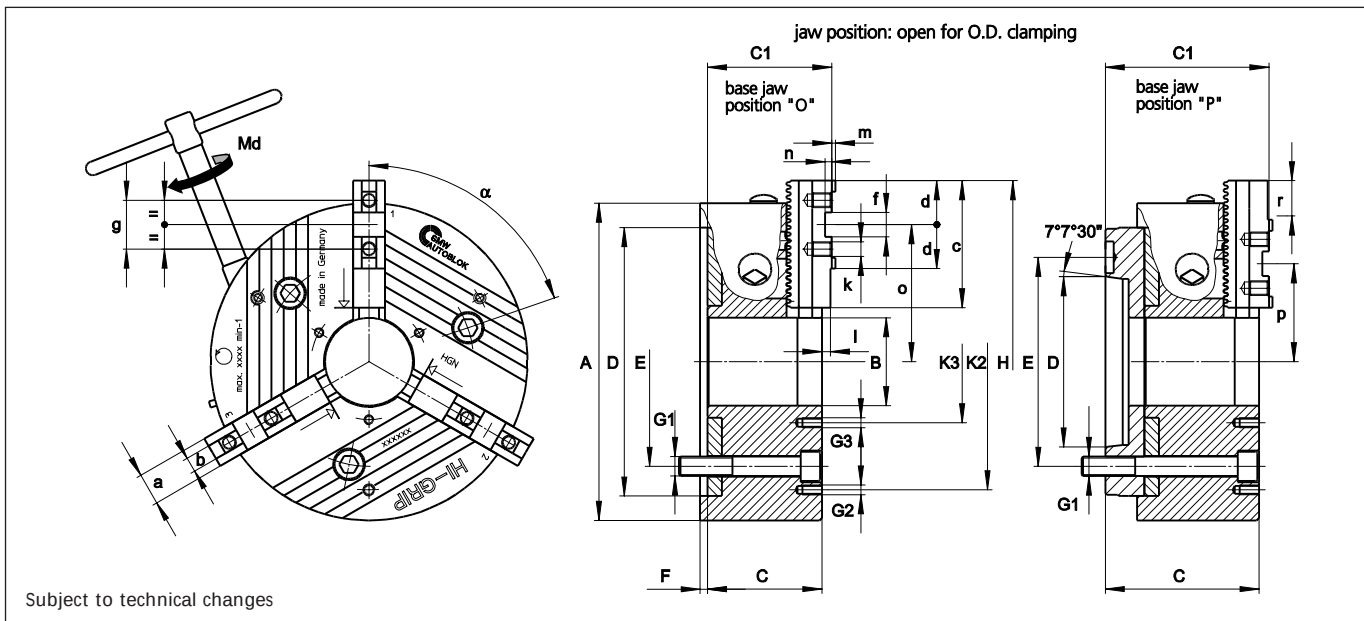


■ The max. gripping force is the total, acting on the 3 jaws, obtained by applying to the chuck the max. allowed torque for actuation. The data refers to a chuck in good conditions, using SMW K05 grease.



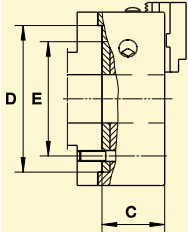
■ The dynamic gripping forces have been measured using hardened standard stepped monoblock jaws type GST, which are not exceeding the outer diameter of the chuck. In case of heavier clamping jaws it is necessary to reduce the rotating speed.

Main dimension and technical details



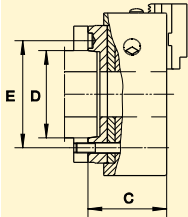
SMW-Autoblok Type HG-N		160-46	210-60	260-72	315-91	400-128	500-165	630-254
Mounting	size	Z140	Z170	Z220	Z300	Z380	Z380	Z380
	A	165	210	260	315	400	500	630
	B	46	60	72	91	128	165	254
	C	65	85,5	93,7	111	125	136	136
	C1	71	90,4	102	120,1	134,3	146	146
	H6	D	140	170	220	300	380	380
	E	104,8	133,4	171,4	235	330,2	330,2	330,2
	F	5	6	6	6	6	8	8
	G1	M10	M12	M16	M20	M24	M24	M24
	G2	-	M10	M10	M10	M12	M16	M16
Swing dia.	G3	M5	M6	M8	M10	M12	M12	M12
	H	194	244	300	358	426	530	722
	K2	-	168	210	268	330	430	585
	K3	75	75	95	120	152	195	290
Base jaw	a°	76	74	71	71	71	71	66
		GBK 160	GBK 200	GBK 250	GBK 315	GBK 400	GBK 500	GBK 630
	a	20	22	26	32	32	45	45
	f7	b	8	10	12	12	18	18
H7	c	65	85	104	115	125	160	200
	d	28	33	36	36	43	50	50
	f	18	20	20	(20) 26	26	30	30
	g	32	40	40	(40) 54	54	60	60
Thread/thread depth	k	M8/12	M8/13	M12/15	M12/17	M12/17	M16/34	M16/34
	l	6	4,9	8,3	9,3	9,3	10	10
	m	2,5	2,5	3	3	3	4	4
	n	5	4,5	5,5	6	7	9	9
max/min.	o	69/51,2	88/64,5	112,4/79,4	141,3/102,8	168,8/113,8	211/141	273/203
max/min.	p	59,3/40,5	69/45,5	80,6/47,6	97,3/58,8	129,8/74,8	150/80	173/103
Base jaw tooth pitch	-	4,7	4,7	5,5	5,5	5,5	7	7
Base jaw offset	r	18,8	23,5	33	38,5	55	70	70
Base jaw offset	teeth	4	5	6	7	10	10	10
Usable jaw stroke	mm	5,9	6,4	7,4	9,6	11,4	11,5	13
max. total grip force	kN	60	75	130	180	220	250	250
at max. torque Md	Nm	80	120	160	200	250	260	260
Speed	rpm	5500	4800	4200	3500	2700	1500	1000
Weight without jaws	kg	8,3	19	32	53	103	161	270
Moment of inertia	kgm ²	0,03	0,09	0,25	0,60	1,9	4,5	12

Chuck with center mounting DIN 6350



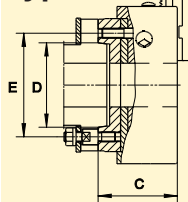
HG-N	160-46		210-60		260-72		315-91		400-128		500-165		630-254	
Mounting		Z140		Z170		Z220		Z300		Z380		Z380		Z380
C		81		85,5		94		111		125		136		136
D		140		170		220		300		380		380		380
E		104,8		133,4		171,4		235		330,2		330,2		330,2
Chuck with GBK + WAK														
		Id.No. 089310		Id.No. 089538		Id.No. 089550		Id.No. 089562		Id.No. 089574		Id.No. 089584		Id.No. 089708
Chuck with GST														
		Id.No. 089312		Id.No. 089313		Id.No. 089317		Id.No. 089321		Id.No. 089325		Id.No. 089328		Id.No. 089709
Chuck with GBK + GUA														
		Id.No. 089331		Id.No. 089539		Id.No. 089551		Id.No. 089563		Id.No. 089575		Id.No. 089585		Id.No. 089710

Chuck with ISO-A mounting DIN 55026



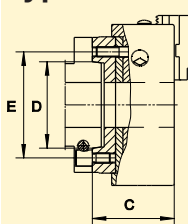
HG-N	160-46		210-60			260-72		315-91		400-128		500-165		630-254	
Mounting	A4	A5	A5	A6	A8	A6	A8	A8	A11	A11	A15	A11	A15	A11	A15
C	101	101	109,5	107,5	125,5	118	119	141	141	165	161	176	172	176	172
D	63,52	82,57	82,57	106,39	139,73	106,39	139,73	139,73	196,88	196,88	285,77	196,88	285,77	196,88	285,77
E	82,6	104,8	104,8	133,4	171,4	133,4	171,4	171,4	235,0	235,0	330,2	235,0	330,2	235,0	330,2
Chuck with GBK + WAK															
	Id.No. 089332	Id.No. 089342	Id.No. 090458	Id.No. 089540	Id.No. 089542	Id.No. 089552	Id.No. 089554	Id.No. 089564	Id.No. 089566	Id.No. 089576	Id.No. 089578	Id.No. 089586	Id.No. 089588	Id.No. 089711	Id.No. 089713
Chuck with GST															
	Id.No. 089962	Id.No. 089346	Id.No. 090459	Id.No. 089314	Id.No. 089315	Id.No. 089318	Id.No. 089319	Id.No. 089322	Id.No. 089323	Id.No. 089326	Id.No. 089327	Id.No. 089329	Id.No. 089330	Id.No. 089715	Id.No. 089732
Chuck with GBK + GUA															
	Id.No. 089427	Id.No. 089434	Id.No. 090460	Id.No. 089541	Id.No. 089543	Id.No. 089553	Id.No. 089555	Id.No. 089565	Id.No. 089567	Id.No. 089577	Id.No. 089579	Id.No. 089587	Id.No. 089589	Id.No. 089749	Id.No. 089760

Chuck with bayonet mounting DIN 55027 Type C



HG-N	160-46		210-60			260-72		315-91		400-128		500-165		630-254	
Mounting	C4	C5	C5	C6	C8	C6	C8	C8	C11	C11	C15	C11	C15	C11	C15
C	101	101	107,5	107,5	125,5	119	119	141	141	161	161	172	172	172	172
D	63,52	82,57	82,57	106,39	139,73	106,39	139,73	139,73	196,88	196,88	285,77	196,88	285,77	196,88	285,77
E	85	104,8	104,8	133,4	171,4	133,4	171,4	171,4	235,0	235,0	330,2	235,0	330,2	235,0	330,2
Chuck with GBK + WAK															
	Id.No. 089464	Id.No. 089487	Id.No. 090461	Id.No. 089544	Id.No. 089546	Id.No. 089556	Id.No. 089558	Id.No. 089568	Id.No. 089570	Id.No. 089580	Id.No. 089582	Id.No. 089590	Id.No. 089592	Id.No. 089761	Id.No. 089762
Chuck with GST															
	Id.No. 089488	Id.No. 089489	Id.No. 090462	Id.No. 089478	Id.No. 089479	Id.No. 089480	Id.No. 089476	Id.No. 089481	Id.No. 089482	Id.No. 089483	Id.No. 089484	Id.No. 089485	Id.No. 089486	Id.No. 089765	Id.No. 089766
Chuck with GBK + GUA															
	Id.No. 089518	Id.No. 089519	Id.No. 090463	Id.No. 089545	Id.No. 089547	Id.No. 089557	Id.No. 089559	Id.No. 089569	Id.No. 089571	Id.No. 089581	Id.No. 089583	Id.No. 089591	Id.No. 089593	Id.No. 089786	Id.No. 089802

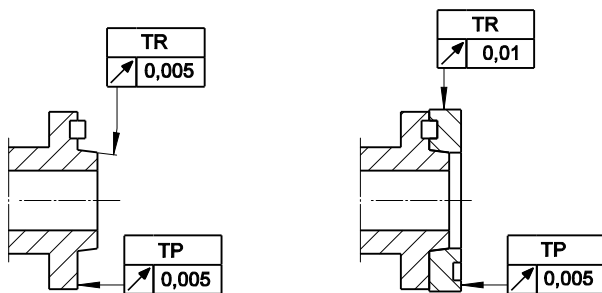
Chuck with Camlock mounting DIN 55029 Type S



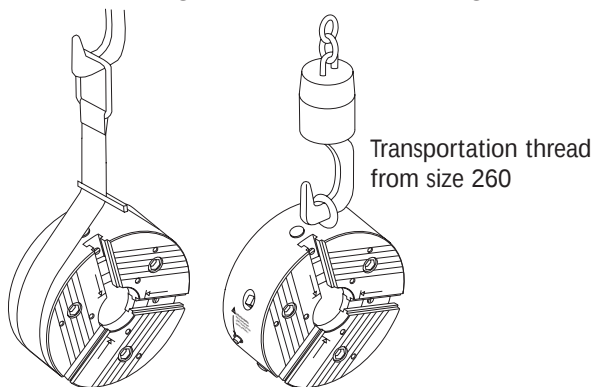
HG-N	160-46		210-60			260-72		315-91		400-128		500-165		630-254	
Mounting	S4	S5	S5	S6	S8	S6	S8	S8	S11	S11	S15	S11	S15	S11	S15
C	109	109	118,5	118,5	125,5	132	132	154	154	175	175	186	186	186	186
D	63,52	82,57	82,57	106,39	139,73	106,39	139,73	139,73	196,88	196,88	285,77	196,88	285,77	196,88	285,77
E	82,6	104,8	104,8	133,4	171,4	133,4	171,4	171,4	235,0	235,0	330,2	235,0	330,2	235,0	330,0
Chuck with GBK + WAK															
	Id.No. 089520	Id.No. 089528	Id.No. 090464	Id.No. 089901	Id.No. 089905	Id.No. 089909	Id.No. 089913	Id.No. 089917	Id.No. 089921	Id.No. 089925	Id.No. 089929	Id.No. 089933	Id.No. 089937	Id.No. 089803	Id.No. 089832
Chuck with GST															
	Id.No. 089602	Id.No. 089663	Id.No. 089996	Id.No. 089899	Id.No. 089903	Id.No. 089907	Id.No. 089911	Id.No. 089915	Id.No. 089919	Id.No. 089923	Id.No. 089927	Id.No. 089931	Id.No. 089935	Id.No. 089843	Id.No. 089897
Chuck with GBK + GUA															
	Id.No. 089668	Id.No. 089674	Id.No. 090466	Id.No. 089902	Id.No. 089906	Id.No. 089910	Id.No. 089914	Id.No. 089918	Id.No. 089922	Id.No. 089926	Id.No. 089930	Id.No. 089934	Id.No. 089938	Id.No. 089942	Id.No. 089955

Parts included: Fixing elements (screws resp. studs resp. Camlock bolts)

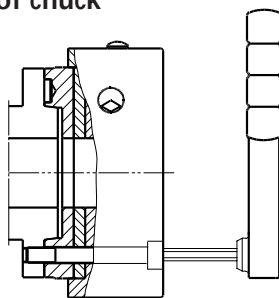
1 Check spindle nose



2 Use mounting belt for safe mounting



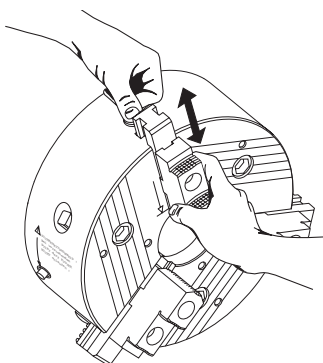
3 Mounting of chuck



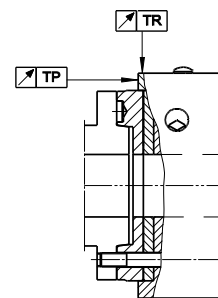
Tighten bolts one after another with torque wrench.

Bolt 10.9 DIN 912	M10	M12	M16	M20	M24
Tightening torque Md (Nm)	48	70	170	300	500

4 Check easy movement of jaws

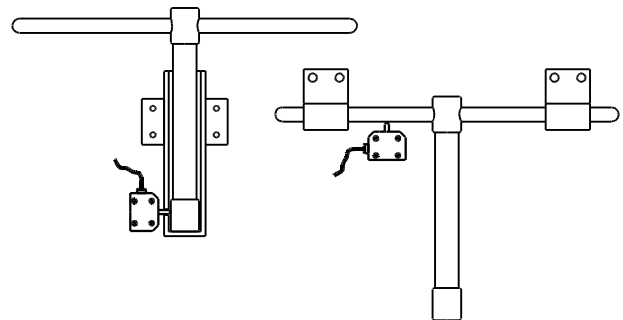


5 Check radial and face runout



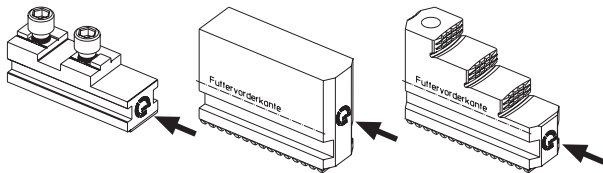
HG-N	160-210	260-400	500-630
TR	0,02	0,03	0,05
TP	0,02	0,03	0,05

6 Electrically protection against spindle start. Spindle may only start when key is in the key box.



According to DIN/EN 1550 the machine must be electrically locked against spindle start while if the wrench is still in the chuck. Spindle may start after key is in the key box/key holder only.

Mounting of top jaws on master jaws GBK

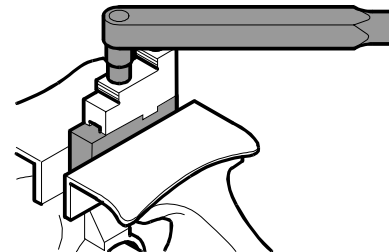
1


Use original SMW-Autoblok jaws only! They are marked on their face with the logo.

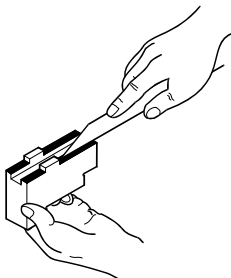
3

WARNING!

Use mounting bolts 12.9 DIN 912 only. Always check correct length of thread engagement! Use torque wrench and tighten one after another. Do not exceed torque (Md) otherwise master jaw gets distorted.



HG-N	160	210	260	315	400	500	630
Bolt	M8	M8	M12	M12	M12	M16	M16
Md (Nm)	35	35	65	65	65	170	170
length of thread engagement	11 ⁺¹	11 ⁺¹	15 ⁺²	15 ⁺²	15 ⁺²	20 ⁺²	20 ⁺²

2

WARNING!

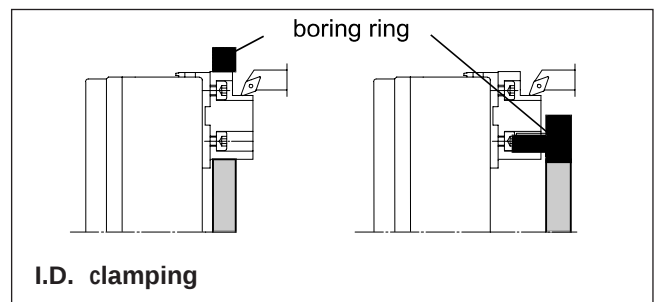
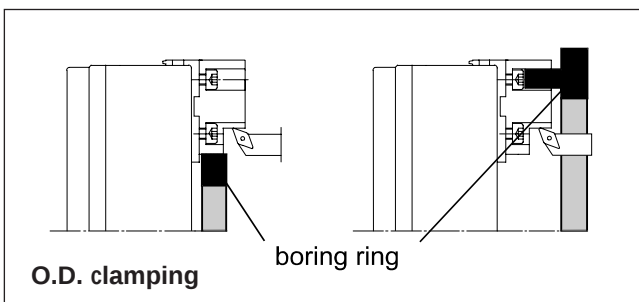
Mounting surfaces of the top jaws must be straight and on the same level. Otherwise the master jaw gets distorted and locks in the guideway.


WARNING!

Jaws of other manufacturers:

- Safety risks due to wrong material or heat treatment
- Danger of damage of your HG-N chuck due to wrong dimensions/tolerances
- No warranty from SMW-AUTOBLOK

Boring of soft jaws

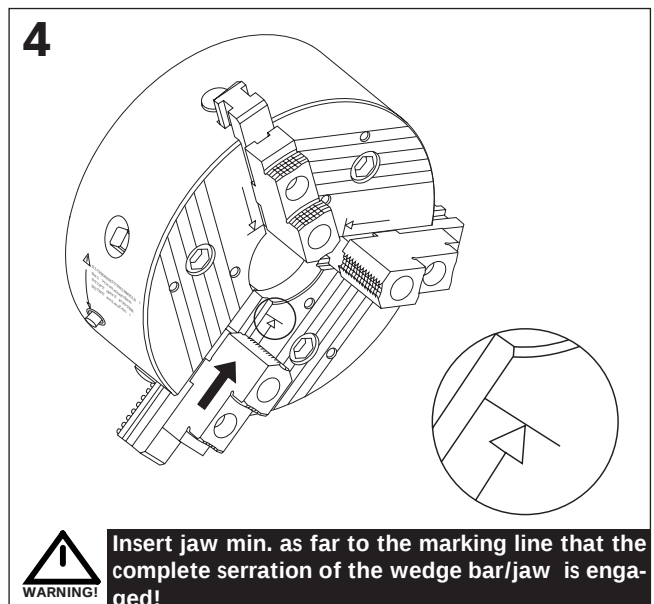
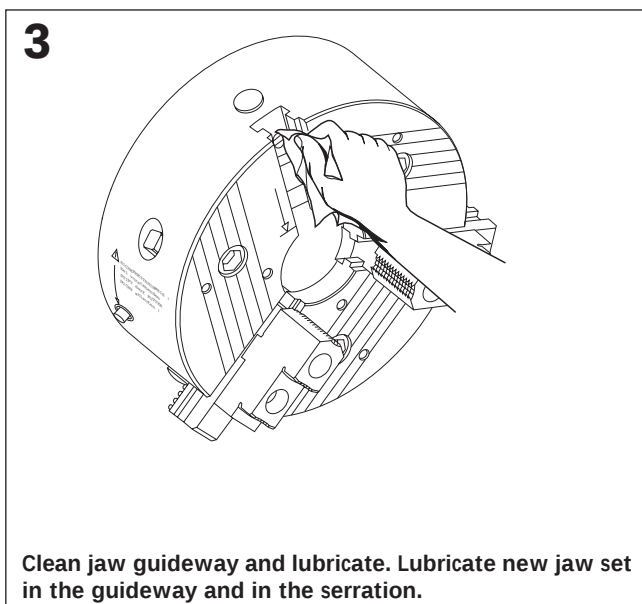
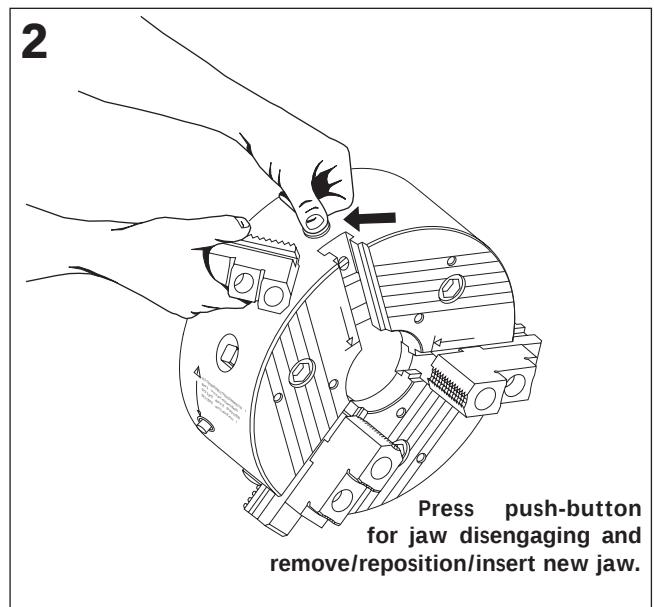
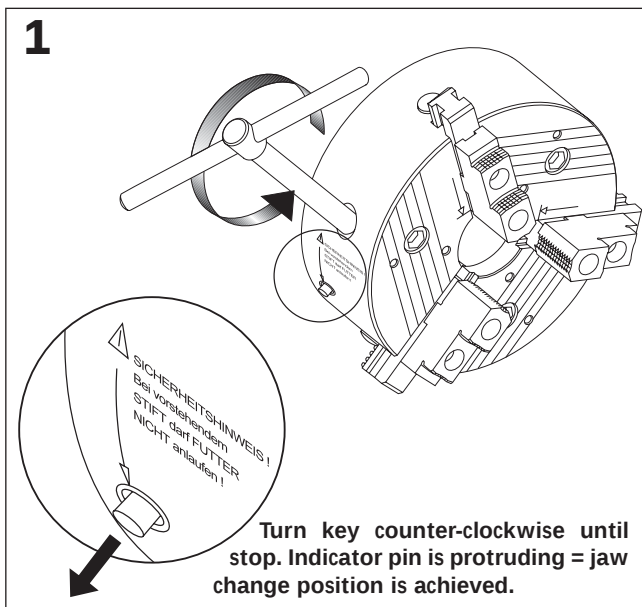
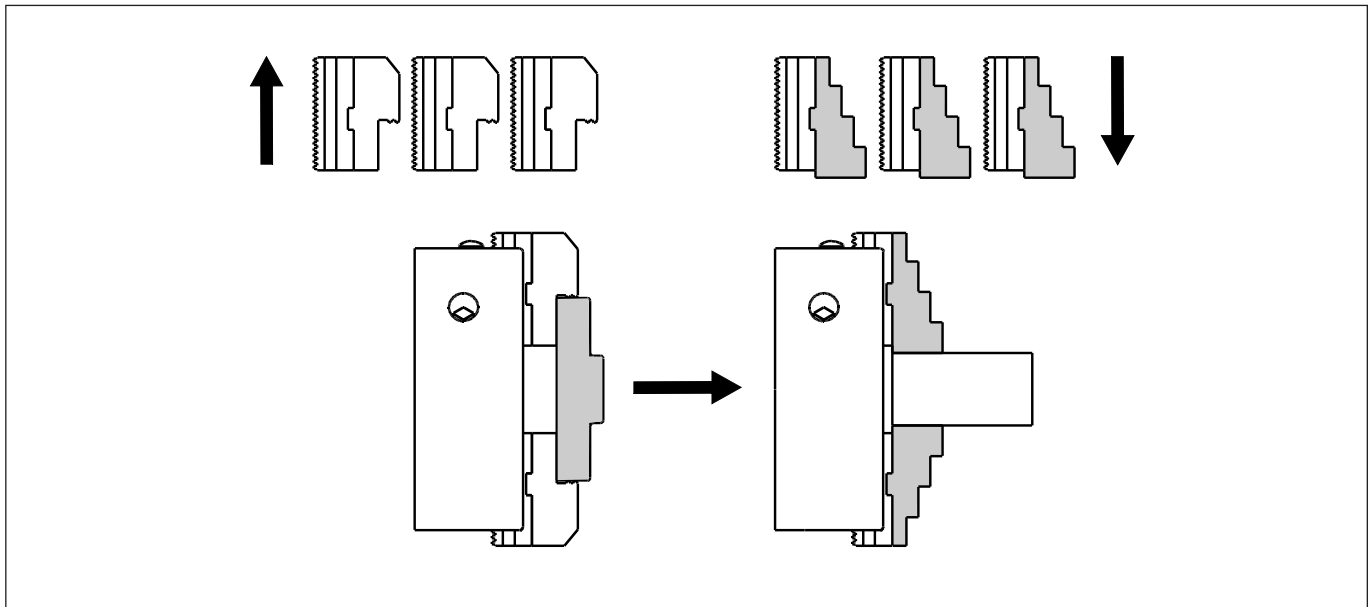


Tip:

- Always tighten bolts of top jaws with torque wrench.
- Boring ring must be gripped as close to the gripping area as possible.
- Never grip boring ring with master jaws.

- Always machine top jaws under gripping force. Use rigid boring ring.
- For repeating jobs store top jaws with master jaws as one unit.

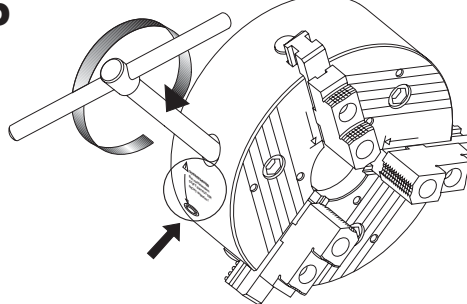
Changing or re-positioning of the jaws



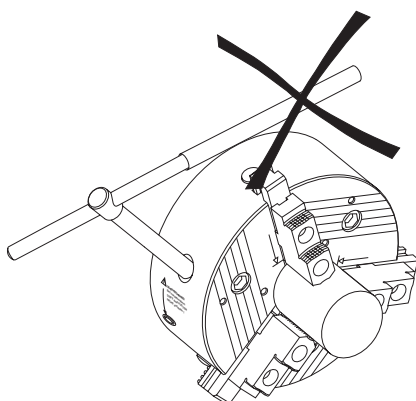
5

**For changing/
re-positioning
jaw No. 2 and jaw No. 3
repeat steps 2-4**

To ensure highest repeatability please note:
Insert jaw 1 in guideway 1, jaw 2 in guideway 2 etc.

6

WARNING!

Turn wrench clock-
wise until indicator
pin is no more
protruding. Chuck
is ready for clamp-
ing and workpie-
ces can be clamped.

7

WARNING!

**Never use an extension during clamping!
Do not exceed max. torque!
Remove wrench immediately!**

HG-N	160	210	260	315	400	500	630
Wrench	80	120	160	200	250	260	260
Md _{max} (Nm)							

8

**Please check before
spindle start:**


WARNING!

Insert jaw at least to the marking line!


WARNING!

Never rotate the chuck with the indicator pin
protruding!


WARNING!

Always remove wrench!


WARNING!

Workpiece must be clamped safely!





Regular maintenance is the basis for correct function, long service life, precision and clamping force of the clamping chuck.



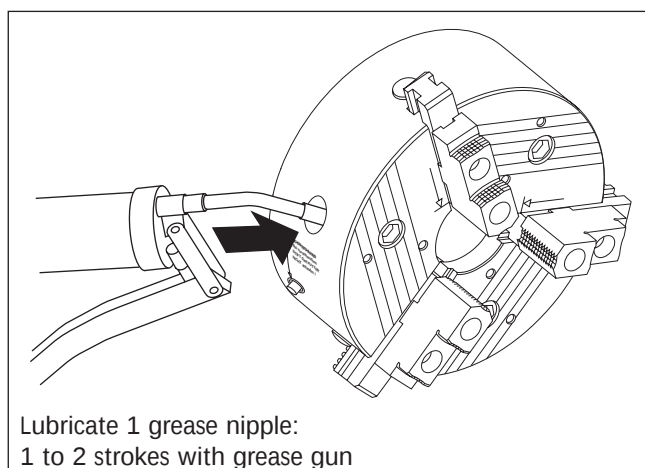
Check gripping force regularly with gripmeter!



Use original SMW-AUTOBLOK K05 grease! The use of unsuitable lubricants can cause considerable losses in clamping force or damage to the clamping chuck.



Never use coolants which dissolve the grease!



Maintenance intervals at normal conditions / using coolant

Measurement	Lubricate with K05 grease	Disassemble + clean see page 19 + 20
after operating hours	20	1000

Maintenance intervals at rough conditions / using coolant

Measurement	Lubricate with K05 grease	Disassemble + clean see page 19 + 20
after operating hours	8	600

Grease gun

Grease gun for 14 Oz. cartridges
to DIN 1284
refillable with cartridges or from grease can



Greasing set, Id.No. 083726

Supply range:

- grease gun
- 1 flexible adapter for hydraulic type lubricating nipple
- 1 adapter for funnel type lubricating nipple

Grease K05

Special grease for manual and power chucks



Cartridge 14 Oz.
DIN 1284
Grease content 500 g
Id.No. 016440



Can 1000 g
Id.No. 011881

- High adhesion
- High resistance against coolant = long lubrication intervals
- High load bearing capacity
- Low friction coefficient
- High clamping force
- Avoids tribocorrosion

Important for maintenance and safe operation

Test certificate manual chucks type HG-N/HG-F (referring to DIN 6386 part 2)

Chuck type: HG- Ser.No.: _____

Test function O.K. ☐ Tester: _____

Test precision O.K. ☐ Date: _____



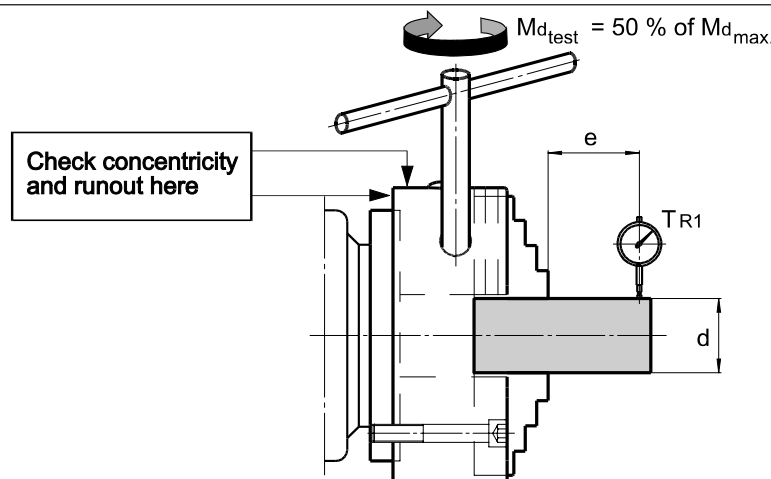
SMW-AUTOBLOK GmbH
Wiesentalstrasse 28
D-88074 Meckenbeuren
Tel. 0 75 42/4 05-0
Fax 0 75 42/38 86

Every HG-N/HG-F chuck is tested for function and precision before shipping.

The result is stated in this test certificate.

If the concentricity test is repeated on your machine please note the following in addition to the instruction manual:

1. Chuck must be in good condition, if necessary cleaned and properly greased with SMW-Autoblok K05 grease.
2. Check concentricity and runout of chuck at the points according to sketch.
3. Important: Use a hardened and ground test bar with same $\varnothing$ as stated in the test certificate!
Attention: If $\varnothing$ of the test bar is different the test result is not correct!
4. Clamp test bar with $M_{d_{test}}$ (50 % of the max. permissible torque) and measure concentricity Tr_1 of the test bar at distance e .



HG-N	$M_{d_{test}}$ (Nm)	e (mm)	$\varnothing d$ (mm)	Tr_1 nominal*	Tr_1 actual**
160-41	40	40	35	0,03	
210-60	60	40	50	0,04	
260-72	80	60	60	0,05	
315-91	100	80	80	0,06	
400-128	125	80	100	0,07	
500-165	130	120	153	0,08	
630-254	130	120	153	0,08	

* Tr_1 nominal according to DIN 6386 part 2 precision class 1 tongue and groove.

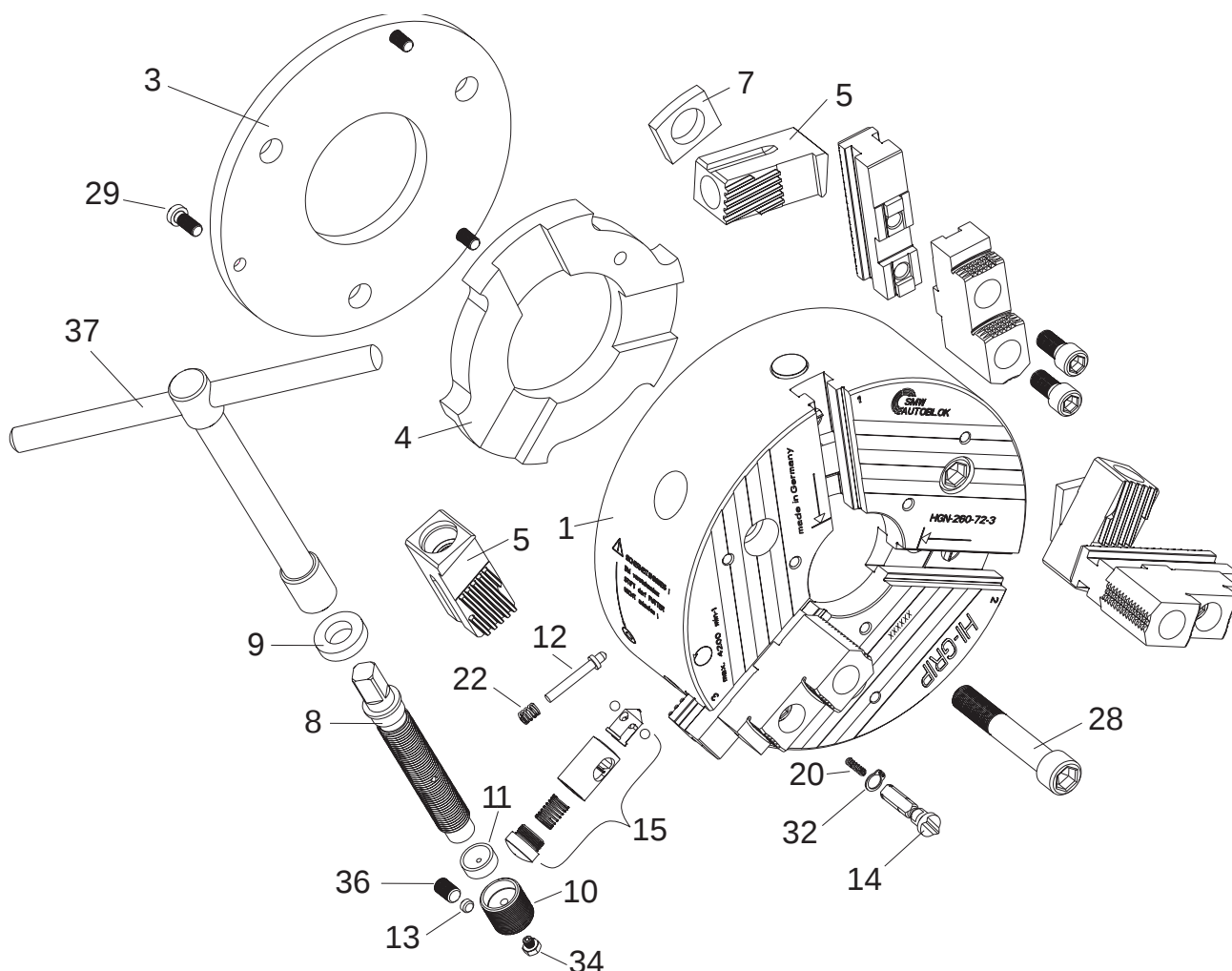
** Tr_1 actual (measured) refers to hardened jaws type **GST/GUA** ground on chuck.
Important: To maintain the concentricity on **GUA** jaws, the jaws must remain mounted on the master jaws after grinding, without loosening the mounting bolts.

Disassembling

1. Remove clamping jaws from chuck.
2. Disassemble chuck from machine and put on work bench with frontside down.
3. Remove screws (29) and cover (3).
4. Remove drive ring (4), sliding pads (7), 2 wedge bars (5) (without thread) from chuck.
5. Disassemble indicator pin (12) with spring (22).
6. Remove springs (20) from stop pin bore (14).
7. Remove threaded pin (36) and copper bolt (13).
8. Remove spindle bearing (10).
9. Turn spindle (8) with wrench (37) clockwise until close to end stop.
10. Shift spindle with wedge bar to the left and disassemble pressure washer (9).
11. Shift spindle with wedge bar to the right, tilt left side upward and remove spindle with wedge bar.
12. Remove circlip (32) from stop pin (14), underlay chuck and remove stop pin.
13. Remove disengaging cartridge (15) radially.
Do not disassemble disengaging cartridge any further.
14. Clean all parts and check for wear or damage.
15. Replace damaged or worn out parts by original SMW-AUTOBLOK spare parts only!

Assembling

1. Assembling in reverse sequence as disassembling.
2. Clean parts and lubricate with SMW-AUTOBLOK K05 grease.
3. Tighten spindle bearing (10) firm and loosen so that spindle can be moved easily but without clearance. Secure spindle bearing (10) with threaded pin (36) and copper bolt (13).
4. Check chuck to function and lubricate with SMW-AUTOBLOK K05 grease.


Important

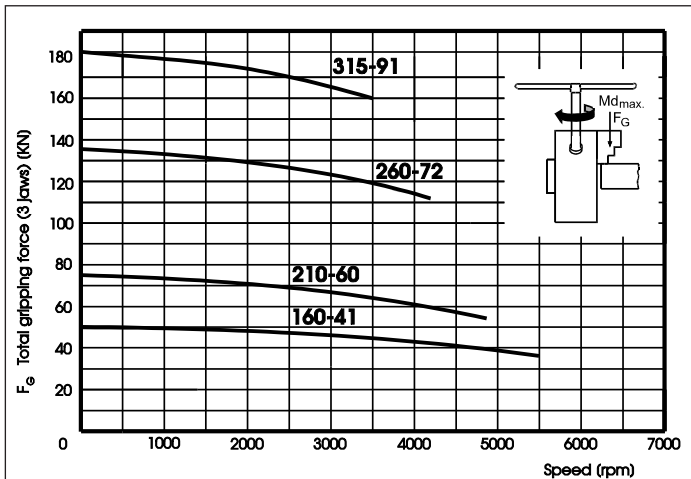
For spare parts order please advise **chuck type and serial number!**
 Ordering example: For HG-N 210-60 serial number 100912
 Pos. 5: 1 set wedge bars

Pos.	Qty.	Description	Note
1	1	Chuck body	
2			
3	1	Cover	
4	1	Drive ring	
5	1	Wedge bar	1 set = 3 pcs.
6			
7	3	Sliding block	
8	1	Spindle	
9	1	Pressure washer	
10	1	Spindle bearing	
11	1	Pressure piece	
12	1	Indicator pin	
13	1	Copper bolt	
14	3	Stop pin	
15	3	Disengaging cartridge compl.	
16			
17			
18			
19			

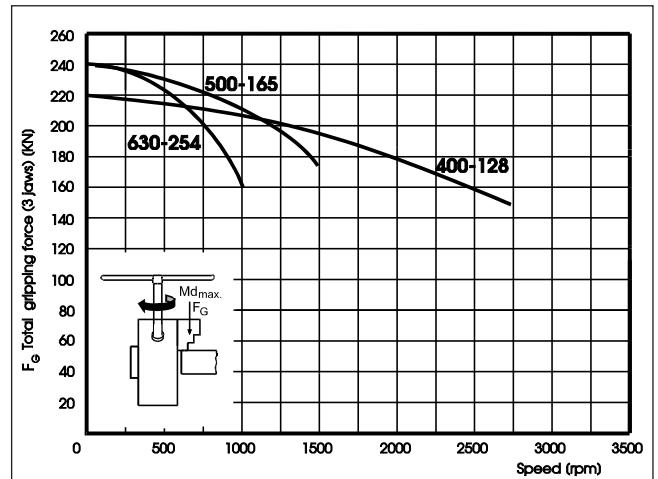
Pos.	Qty.	Description	Note
20	3	Compression spring	
21			
22	1	Compression spring	
23			
24			
25			
26			
27			
28	3	Cylindrical bolt	
29	3	Cylindrical bolt	
30			
31			
32	3	Retaining ring	
33			
34	1	Grease nipple	
35			
36	1	Threaded pin	
37	1	Wrench	

Trouble	Caused by	Action
1 Heavy vibrations on the machine spindle	A Unbalance due to component or top jaws	Change shape of top jaws or balance with counterweights on the chuck body.
	B Unbalance on the parts: - machine spindle - drive - chuck adapter	Check runout on all components one after another. Center, balance or replace the parts.
	C Unbalance due to collision	Send chuck back to SMW-AUTOBLOK for inspection.
2 Gripping force is too low	A Short jaw movement at large quantity of same workpieces Insufficient film of lubricant	Actuate chuck without workpiece several times at full jaw stroke. Film of lubricant is rebuild and chuck achieves full gripping force again.
	B Lubrication is not sufficient	Lubricate or clean the chuck with SMW-AUTOBLOK K05 grease. Check type of grease.
	C Chuck is contaminated by dirt	Disassemble, clean and lubricate chuck.
	D Malfunction of the chuck	Check all chuck parts. Replace damaged parts by original SMW-AUTOBLOK spare parts.
3 Radial runout or insufficient repeatability	A Top jaws are not bored or ground properly	Rebore or regrind top jaws see page 11.
	B Jaws are inserted into wrong guideway	Insert jaw 1 in guideway 1, jaw 2 in guideway 2 etc.
	C Master jaw contaminated with dirt. Master jaw damaged	Clean serration of the master jaws. Replace master jaws.
	D Mounting bolts for the top jaws too short or too long, overloaded	Check length of thread engagement. Replace master jaws, check correct torque (see page 11).
	E Jaws are too high	Change top jaws, method of gripping.
	F Chuck is damaged or worn out	Send chuck back to SMW-AUTOBLOK for inspection.
4 Jaw is locked in the guideway	A Jaw of other manufacturers which do not correspond with SMW-AUTOBLOK specification	Use original- SMW-AUTOBLOK jaws only, see page 11.
	B Master jaw is deflected Mounting surface of top jaws not on same level, contaminated or damaged	Check top jaws and replace if necessary, see page 11.
	C Master jaw is deflected Torque of the mounting bolts too high	Check correct torque, see page 11.

Gripping force - speed diagram



■ The max. gripping force is the total, acting on the 3 jaws, obtained by applying to the chuck the max. allowed torque for actuation. The data refers to a chuck in good conditions, using SMW K05 grease.



■ The dynamic gripping forces have been measured using hardened standard stepped monoblock jaws type GST, which are not exceeding the outer diameter of the chuck. In case of heavier clamping jaws it is necessary to reduce the rotating speed.

Important calculation formulas for practical use

$$F_{sp} = \frac{F_s \cdot S}{\mu_{sp}} \cdot \frac{dz}{dsp} \text{ [N]}$$

$$F_s = f \cdot a \cdot ks \text{ [N]}$$

$$F_c = \sum (m_B \cdot r_s) \cdot \left(\frac{\pi \cdot n}{30} \right)^2 \text{ [N]}$$

$$F_{spd} = F_{sp} - F_c \text{ [N]}$$

$$M_{dz} = \frac{F_s \cdot dz}{2} \text{ [Nm]}$$

$$M_{dsp} = \frac{F_{sp} \cdot \mu_{sp} \cdot dsp}{2} \text{ [Nm]}$$

F_{sp} = req. static chuck grip force [N]

F_{spd} = dyn. chuck grip force [N]

M_{dz} = machining torque [Nm]

a = depth of cut [mm]

dz = machining diameter [m]

ks = specific cutting force [N/mm²]

(see diagram)

n = speed [rpm]

μ_{sp} = coefficient of friction (see diagram)

F_s = main cutting force [N]

F_c = centrifugal force of jaws [N]

M_{dsp} = chuck clamping torque [Nm]

dsp = clamping diameter [m]

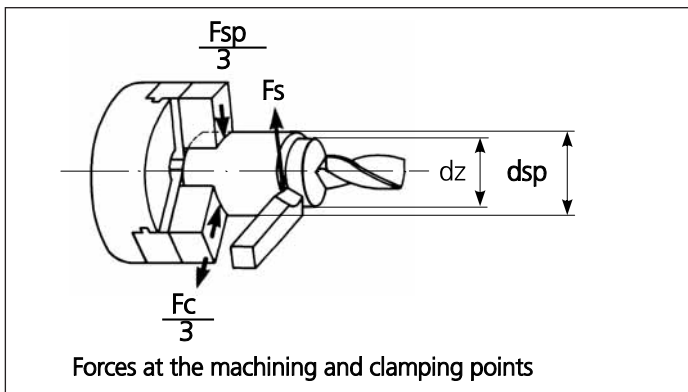
f = feed [mm/Umdr]

m_B = mass jaws per set [kg]

r_s = cent. of gravity radius jaw [m]

S = safety factor (1,5 - 2)

The dynamic grip force F_{spd} is calculated from the static grip force F_{sp} less total centrifugal force of jaws F_c .



Coefficient of friction μ_{sp} for steel parts

Surface of workpiece	Gripping surface of jaws		
	smooth	diamond style	serrated
smooth mach. finish ground	0,07	0,12	0,20
rough to med. machined	0,1	0,2	0,35
unmachined	0,15	0,3	0,45
Correction factors	Aluminium alloy = 0,95		
	Brass = 0,90		
	Grey cast iron = 0,80		

Tolerance classes

The axial and radial runout tolerances are according to the Technical Terms of Delivery for power operated lathe chucks **DIN 6386** of tolerance class 1.

Permissible unbalance

The max. permissible unbalance for lathe chucks is according to the Technical Terms of Delivery for power operated lathe chucks **DIN 6386** of tolerance class 1.

Determination of the permissible speed of lathe chucks (jaw chucks) has to be carried out according to VDI 3106!

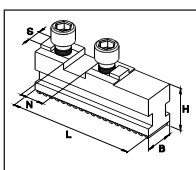
Specific cutting forces ks N/mm²

Material		Strength N/mm ²	Feed s (mm)					
			0,16	0,25	0,4	0,63	1,0	1,6
Steels	St 42	up to 500	2600	2400	2200	2050	1900	1800
	St 50	520	3500	3100	2750	2450	2150	1950
	St 60	620						
	C 45	670	3050	2800	2600	2400	2200	2050
	C 60	770						
	St 70	720	4350	3800	3300	2900	2500	2200
	18CrNi6	630	4350	3800	3300	2900	2500	2200
	42CrMo4	730	4350	3900	3450	3100	2750	2450
	16MnCr5	770	3750	3300	2950	2600	2300	2050
	Mn, CrNi	850-1000	3700	3400	3100	2800	2550	2350
	Mn-hardened		5400	4900	4400	4000	3600	3300
	GS 45	300-500	2300	2100	1950	1800	1700	1600
	GS 52	500-700	2550	2350	2200	2050	1900	1800
	GG 16	HB 2000	1500	1350	1200	1100	1000	900
Cast iron materials	GG 25	HB2000-2500	2050	1800	1600	1450	1300	1150
Non ferrous metals	Cast bronze		2550	2350	2200	2050	1900	1800
	Gunmetal		1100	1000	900	800	700	650
	Brass	HB800-1200	1200	1100	1000	900	800	750
	Cast alu.	300-420	1100	100	900	800	700	650

HG-N 160-46

Hardened base jaws type GBK

Type	Id.No.	B	H	L	N	S	kg/set
GBK 160	012439	20	27,5	65	18	8	0,7

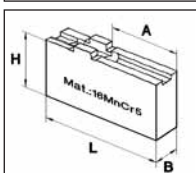


Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 160-10	012491	20	35,5	85	42	1,2

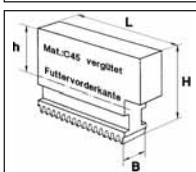
Soft top jaws type WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 140-10	012496	35	35,5	63	25	1,5



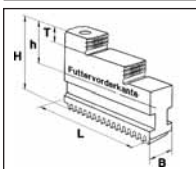
Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 160	012447	20	55,5	35	65	1,4



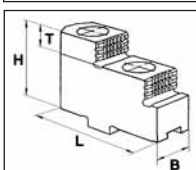
Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 160-2	012454	20	43,5	23	58	7	0,6



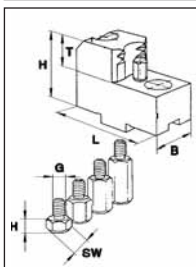
Hardened reversible stepped top jaws type GUA

Type	Id.No.	B	H	L	T	kg/set
GUA 160	012484	20	36,5	63	7,5	0,6



Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 1751	012464	25	40	64	16	M5	0,9
GGK 1752	012465	25	40	68	16	M5	1,0
GGK 1753	012466	25	40	60	16	M5	1,0
GGK 1754	012467	25	40	56	16	M5	0,9
GGK 1755	012468	25	40	70	16	M5	1,0
ALB 505	016510		5		SW 10	M5	
ALB 510	016508		10		SW 10	M5	
ALB 515	016509		15		SW 10	M5	



Type	GST		
Id.No.	012454		
A ₁	12-59	J ₁	44-78
A ₂	42-89	J ₂	74-110
A ₃	73-120	J ₃	105-141
A ₄	104-151	J ₄	135-182
S	198		

Clamping range of hardened monoblock jaws type GST

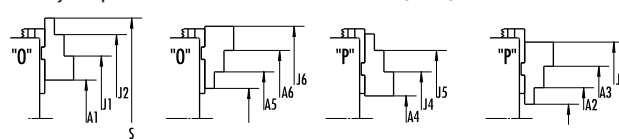


Type	GUA		
Id.No.	012484		
A ₁	32-69	A ₄	13-51
A ₂	60-98	A ₅	78-116
A ₃	85-123	A ₆	103-141
J ₁	91-129	J ₄	74-111
J ₂	116-154	J ₅	99-136
J ₃	144-181	J ₆	162-200
S	198		

Clamping range of hardened reversible top jaws type GUA

Base jaw position »O«

Base jaw position »P«

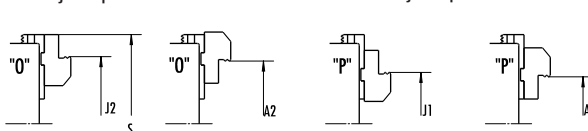


Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012464	25-62	133-171	33-80	155-190
012465	32-61	134-172	42-79	153-181
012466	52-89	107-145	70-107	125-163
012467	77-115	81-118	95-133	99-137
012468	-	47-65	-	46-83
S	198	210	198	198

Clamping range of hardened roughing jaws type GGK

Base jaw position »O«

Base jaw position »P«



HG-N 210-60

Hardened base jaws type GBK

Type	Id.No.	B	H	L	N	S	kg/set
GBK 200	012440	22	5	85	20	10	1,0

Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 200-10	012492	22	42	105	50	2,0

Soft top jaws type WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 200-30	012497	40	36	70	27	1,9

Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 200	012448	22	64,5	40	77	2,0

Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 210	035863	22	51	26	84	8	1,2

Hardened reversible stepped top jaws type GUA

Type	Id.No.	B	H	L	T	kg/set
GUA 200	012485	22	38	72	10	0,8

Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 2001	012469	28	45	87	20	M5	1,9
GGK 2002	012470	28	45	66	20	M5	1,3
GGK 2003	012471	28	45	66	20	M5	1,3
GGK 2004	012472	28	40	85	20	M5	1,7
GGK							
ALB 505	016510		5		SW 10	M5	
ALB 510	016508		10		SW 10	M5	
ALB 515	016509		5		SW 10	M5	

Type	GST		
Id.No.	035863		
A ₁	10-96	J ₁	70-147
A ₂	56-130	J ₂	109-187
A ₃	96-172	J ₃	149-228
A ₄	136-210	J ₄	186-260
S	244		

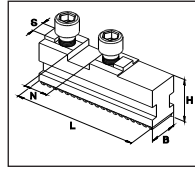
Type	GUA		
Id.No.	012485		
A ₁	55-111	A ₄	17-23
A ₂	69-125	A ₅	104-163
A ₃	96-152	A ₆	131-190
J ₁	117-174	J ₄	80-136
J ₂	144-201	J ₅	107-163
J ₃	158-215	J ₆	193-253
S	196-253/255		

Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012469	29-59	187-252	36-87	-
012470	57-122	121-186	94-150	158-215
012471	93-149	85-140	131-187	122-178
012472	152-208	54-81	189-246	63-119

HG-N 260-72

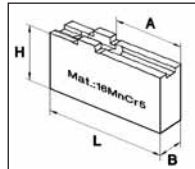
Hardened base jaws type GBK

Type	Id.No.	B	H	L	N	S	kg/set
GBK 250	012441	26	37	104	20	12	1,8



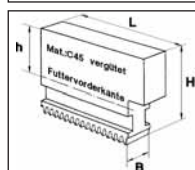
Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 250-10	012493	30	50	125	70	3,6



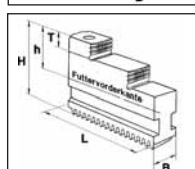
Soft top jaws type WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 250-20	012498	60	55	90	44	6,2



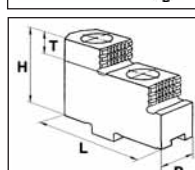
Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 250	012449	26	84	55	97	4,2



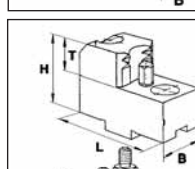
Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 250	012456	26	60	31	90	10	1,9



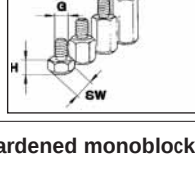
Hardened reversible stepped top jaws type GUA

Type	Id.No.	B	H	L	T	kg/set
GUA 250	012486	30	50	90	14	1,9



Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 2501	012464	40	50	94	22	M6	3,0
GGK 2502	012465	40	50	72	22	M6	2,3
GGK 2503	012466	40	50	78	22	M6	2,6
GGK 2504	012467	40	50	108	22	M6	3,2
GGK							
ALB 605	016513		6		SW 10	M6	
ALB 610	016511		10		SW 10	M6	
ALB 615	016512		15		SW 10	M6	



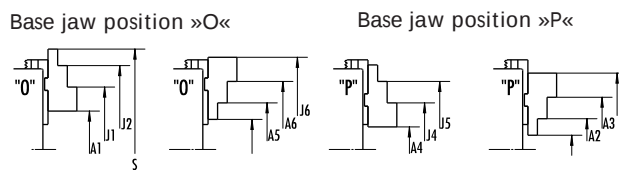
Type	GST		
Id.No.	012456		
A ₁	33-99	J ₁	81-147
A ₂	76-142	J ₂	125-191
A ₃	120-186	J ₃	169-235
A ₄	164-230	J ₄	211-278
S	280		

Clamping range of hardened monoblock jaws type GST



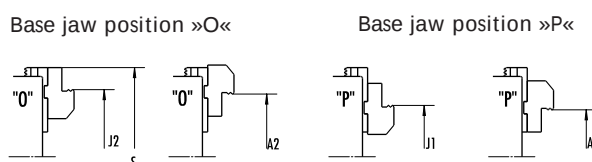
Type	GUA		
Id.No.	012486		
A ₁	73-161	A ₄	20-97
A ₂	45-101	A ₅	76-165
A ₃	125-181	A ₆	156-245
J ₁	152-240	J ₄	101-177
J ₂	233-321	J ₅	180-257
J ₃	204-259	J ₆	253-323
S	333		

Clamping range of hardened reversible top jaws type GUA



Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012473	45-85	197-274	61-148	254-342
012474	78-154	132-208	141-218	195-272
012475	107-184	109-175	159-247	152-238
012476	-	-	-	80-156

Clamping range of hardened roughing jaws type GGK



HG-N 315-91

Hardened base jaws type GBK

Type	Id.No.	B	H	L	N	S	kg/set
GBK 315	012442	32	43	115	20	12	2,7

Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 250-10	012493	30	50	125	70	3,6

Soft top jaws type WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 250-30	012499	80	55	90	44	8,5

Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 315	012450	32	90	56	118	6,6

Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 315	012457	32	66	32	117	10	3,4

Hardened reversible stepped top jaws type GUA

Type	Id.No.	B	H	L	T	kg/set
GUA 250	012486	30	50	90	14	1,9

Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 2501	012473	40	50	94	22	M6	3,0
GGK 2502	012474	40	50	72	22	M6	2,3
GGK 2503	012475	40	50	78	22	M6	2,6
GGK 2504	012477	40	50	84	22	M6	2,8
GGK							
ALB 605	016513		6		SW 10	M6	
ALB 610	016511		10		SW 10	M6	
ALB 615	016512		15		SW 10	M6	

Type	GST		
Id.No.	012457		
A ₁	20-115	J ₁	80-170
A ₂	85-180	J ₂	135-225
A ₃	140-235	J ₃	190-282
A ₄	195-290	J ₄	255-350
S	350		

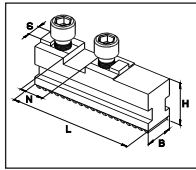
Type	GUA		
Id.No.	012486		
A ₁	120-205	A ₄	36-188
A ₂	48-120	A ₅	120-205
A ₃	130-200	A ₆	205-285
J ₁	202-285	J ₄	110-200
J ₂	280-365	J ₅	198-280
J ₃	208-280	J ₆	276-365
S	390		

Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012473	34-100	210-300	-	300-370
012474	90-175	-	170-262	-
012475	-	110-210	206-292	-
012477	-	82-160	-	-

HG-N 400-128

Hardened base jaws type GBK

Type	Id.No.	B	H	L	N	S	kg/set
GBK 400	012443	32	43	125	26	12	3,0

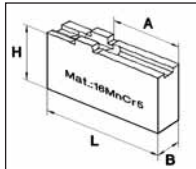


Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 400-10	012494	35	54	145	74	5,8

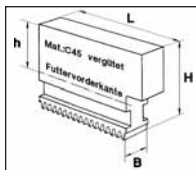
Soft top jaws type WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 400-30	012500	80	64	100	44	11,0



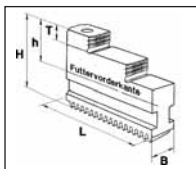
Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 400	012451	32	100	66	145	9,0



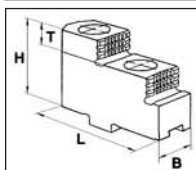
Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 400	012458	32	70	36	137	11	4,4



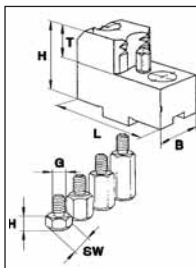
Hardened reversible stepped top jaws type GUA

Type	Id.No.	B	H	L	T	kg/set
GUA 400	012487	36	56	105	15	3,2



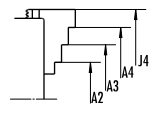
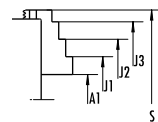
Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 4001	012478	50	55	104	25	M8	4,8
GGK 4002	012479	50	55	91	25	M8	3,5
GGK 4003	012480	50	55	92	25	M8	3,6
ALB 805	017603		5		SW 13	M8	
ALB 810	016514		10		SW 13	M8	
ALB 815	016515		15		SW 13	M8	
ALB 820	016516		20		SW 13	M8	
ALB 825	081191		25		SW 13	M8	



Type	GST		
Id.No.	012458		
A ₁	48-173	J ₁	118-243
A ₂	116-238	J ₂	186-310
A ₃	184-308	J ₃	253-378
A ₄	252-378	J ₄	328-448
S	456		

Clamping range of hardened monoblock jaws type GST

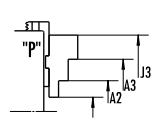
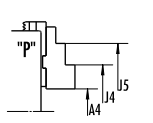
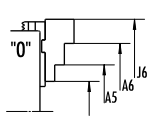
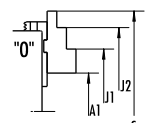


Type	GUA		
Id.No.	012487		
A ₁	138-258	A ₄	60-183
A ₂	78-188	A ₅	143-268
A ₃	186-298	A ₆	253-378
J ₁	218-338	J ₄	138-263
J ₂	328-448	J ₅	248-373
J ₃	263-380	J ₆	333-458
S			

Clamping range of hardened reversible top jaws type GUA

Base jaw position »O«

Base jaw position »P«

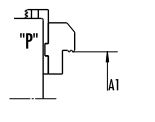
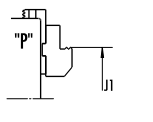
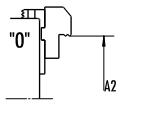
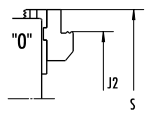


Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012478	78-188	258-378	143-263	333-453
012479	-	140-263	258-378	-
012480	-	118-243	-	-

Clamping range of hardened roughing jaws type GGK

Base jaw position »O«

Base jaw position »P«



HG-N 500-165

Hardened base jaws type GBK

Typ	Id.No.	B	H	L	N	S	kg/set
GBK 500	012444	45	57	160	30	18	7,1

Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 500-10	012495	50	73	180	100	13,7

Soft top jaws type Typ WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 500-30	012501	90	73	130	65	16,4

Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 500	012452	45	124	77	175	19,5

Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 500	012459	45	93	46	175	20	11,7

Hardened reversible stepped top jaws type GUA

Typ	Id.No.	B	H	L	T	kg/set
GUA 500	012488	45	70	130	20	10,8

Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 5001	012481	60	74	125	35	M8	8,8
GGK 5002	012482	60	74	108	35	M8	6,7
GGK 5003	012483	50	74	130	35	M8	6,2
ALB 805	017603		5		SW 13	M8	
ALB 810	016514		10		SW 13	M8	
ALB 815	016515		15		SW 13	M8	
ALB 820	016516		20		SW 13	M8	
ALB 825	081191		25		SW 13	M8	

Type	GST		
Id.No.	012459		
A ₁	70-225	J ₁	-
A ₂	170-320	J ₂	180-330
A ₃	315-470	J ₃	325-475
A ₄	-	J ₄	425-560
S	585		

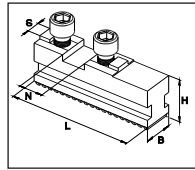
Type	GUA		
Id.No.	012488		
A ₁	190-336	A ₄	55-200
A ₂	80-200	A ₅	190-335
A ₃	200-320	A ₆	315-455
J ₁	305-450	J ₄	170-310
J ₂	425-570	J ₅	290-430
J ₃	335-450	J ₆	425-570
S	590		

Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012481	100-210	280-420	210-350	415-560
012482	-	155-295	330-470	-
012483	-	120-240	-	-

HG-N 630-254

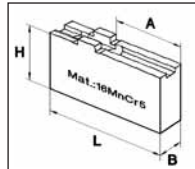
Hardened base jaws type GBK

Type	Id.No.	B	H	L	N	S	kg/set
GBK 630	012445	45	57	200	30	18	9,0



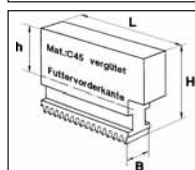
Soft top jaws type WAK

Type	Id.No.	B	H	L	A	kg/set
WAK 500-10	012495	50	73	180	100	13,7



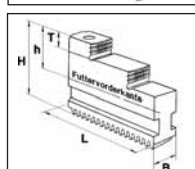
Soft top jaws type WAKS

Type	Id.No.	B	H	L	A	kg/set
WAKS 500-30	012501	90	73	130	65	16,4



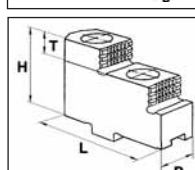
Soft monoblock jaws type UVB

Type	Id.No.	B	H	h	L	kg/set
UVB 630	012453	45	134	87	230	27,5



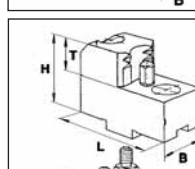
Hardened stepped monoblock jaws type GST

Type	Id.No.	B	H	h	L	T	kg/set
GST 500	012459	45	93	46	175	20	11,7



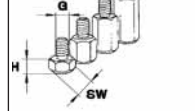
Hardened reversible stepped top jaws type GUA

Type	Id.No.	B	H	L	T	kg/set
GUA 500	012488	45	70	150	20	12,0



Hardened roughing jaws type GGK/Stop pins type ALB

Type	Id.No.	B	H	L	T	G	kg/set
GGK 5001	012481	60	74	125	35	M8	8,8
GGK 5002	012482	60	74	108	35	M8	6,7
GGK							
ALB 805	017603		5		SW 13	M8	
ALB 810	016514		10		SW 13	M8	
ALB 815	016515		15		SW 13	M8	
ALB 820	016516		20		SW 13	M8	
ALB 825	081191		25		SW 13	M8	



Type	GST		
Id.No.	012459		
A ₁	40-240	J ₁	-
A ₂	125-335	J ₂	140-340
A ₃	292-500	J ₃	296-505
A ₄	-	J ₄	400-595
S		700	

Clamping range of hardened monoblock jaws type GST

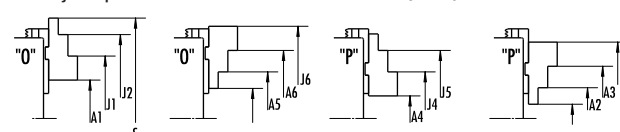


Type	GUA		
Id.No.	012488		
A ₁	192-385	A ₄	60-192
A ₂	85-220	A ₅	225-425
A ₃	205-340	A ₆	345-545
J ₁	345-540	J ₄	200-345
J ₂	465-660	J ₅	320-465
J ₃	355-490	J ₆	495-695

Clamping range of hardened reversible top jaws type GUA

Base jaw position »O«

Base jaw position »P«



Type	GGK			
Id.No.	A ₁	J ₁	A ₂	J ₂
012481	80-240	265-450	240-440	460-650
012482	-	140-320	380-560	-

Clamping range of hardened roughing jaws type GGK

Base jaw position »O«

Base jaw position »P«

