

FORKARDT INTERNATIONAL



μm
precise

PRECISION POWER-OPERATED CHUCK
SYSTEMS FOR CYLINDRICAL GRINDING



Innovative chucking systems for cylindrical grinding.

With its wealth of expertise and development of efficient precision power-operated chucks, FORKARDT ranks as one of the leading manufacturers in this field worldwide.

This expertise benefits the user significantly in terms of: high reliability-by using completely sealed chuck bodies; virtually no maintenance-giving higher productivity, and efficiency-supported by an integrated ball positioning system, for quick jaw changing without adjustment.

The FORKARDT KCHP power-operated

chucks are most frequently used for precise centric chucking on cylindrical grinding machines. A special clamping attachment is designed to provide a floating drive between centres. This patented automatic drive dog, is easily mounted in seconds.

A versatile range of precision chucks for cylindrical grinding machines is readily available in the following variants, although other specific customer requirements can also be supplied:

• Standard chuck 3 KCHP

4



• Front end operated power chuck 3 VKCHP

5



• Fully front end operated power chuck 3 VEKCHP

6



• Accessories

- Soft jaws 7
- Clamping attachments (automatic drive dog) 8
- Chuck flanges and intermediate discs 9
- Pretension discs/rings 10
- Chuck simulator 10
- Actuating cylinder 10
- Further efficient problem solutions 11

High-efficiency cylindrical grinding

µm
precise



• *Centric chucking. Precise.
Variable chucking power.*



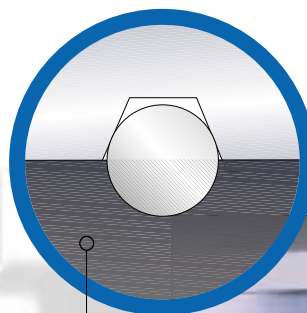
• *Chucking between centres in
quick change, due to patented
automatic drive dog.*

• *Virtually no maintenance and no
wear. Consistent high manufac-
turing quality.*

- *Totally sealed*
- *Oil filled*

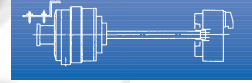


• *Quick jaw changing
without adjustment.
Ball positioning system ensures
precise positioning of location
pockets.*



Standard-chucks

3KCHP 110/130/160/200/250



Cylinder/Draw-tube actuated.

Functions and applications

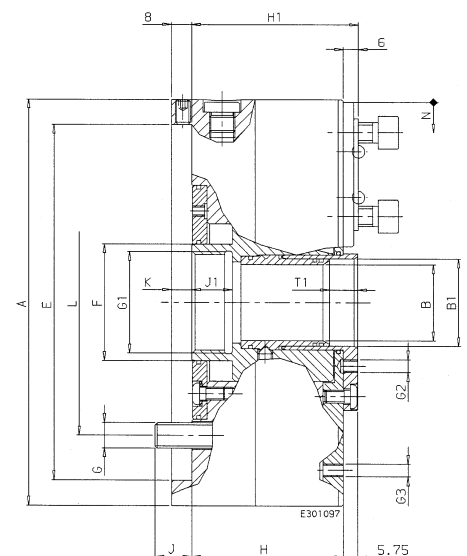
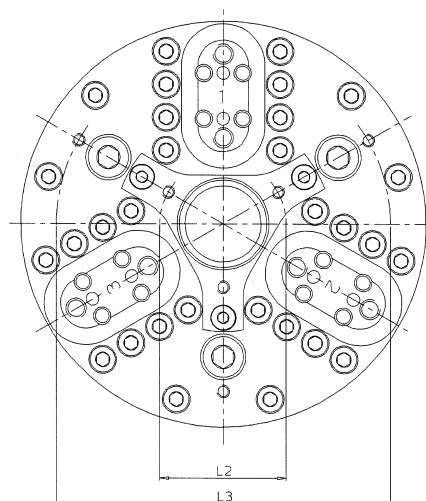
- Power-operated wedge hook chuck.
- For external and internal chucking.
- Base jaws using ball positioning system for quick jaw changing with a positioning accuracy of 2 µm.
- No fouling through grinding residues due to completely sealed chuck body.
- Large bore enables hollow chucking.

Advantages at a glance

- Maximum TIR repeatability (in 2 µm range).
- Precise chucking, pressure control.
- Maximum availability due to freedom from maintenance, permanent lubrication and quick jaw changing without reworking gripping positions.
- Compact size; lightweight design for low inertia.
- Long service life, wear-free.

Chuck type	max. actuating force daN	min. chucking power daN	max. chucking power daN	Permissible speed 1/min	Weight kg	Mass moment of inertia kgm ²
3 KCHP 110-12	500	50	1500	2500	2	0.004
3 KCHP 130-22	500	50	1250	2500	3	0.0068
3 KCHP 160-30	800	50	2250	2250	5	0.016
3 KCHP 200-40	800	50	2250	2000	7.8	0.038
3 KCHP 250-52	800	50	2250	1500	12	0.102

Chuck sizes 315 mm and 400 mm diameter available on request.



Chuck type	Ident. No.	Chuck size		Spindle mount		Chuck height			Bore			Diameter		Mounting screws Threads/Pitch circle diameter							Piston stroke	Jaw stroke
		A	C	H	H1	B	B1	T1	E	F	G	L	J	G1	J1	G2	L2	G3	L3	K		
3 KCHP 110	Z25360	110	Z3	52	58	12	16.5 H ⁷	11	95 H ⁶	23	M10	70.6	12.5	M20x1	14	M4	26	M4	97	6	1.25	
3 KCHP 130	Z24735	130	Z4	52	58	22	26.5 H ⁷	11	115 H ⁶	36	M10	82.6	12.5	M32x1	14	M5	36	M4	97	8	1.5	
3 KCHP 160	Z24681	160	Z5	60	66	30	34.5 H ⁷	11	140 H ⁶	46	M10	104.8	14.5	M40x1.5	16	M5	50	M5	132	10	2.5	
3 KCHP 200	Z24921	198	Z6	62	68	40	44.5 H ⁷	11	170 H ⁶	56	M12	133.4	18	M50x1.5	18	M5	58	M6	176	10	2.5	
3 KCHP 250	Z24698	250	Z8	69	75	52	57 H ⁷	16	220 H ⁶	70	M10	171.4	18	M56x1.5	18	M5	72	M6/M6	132/192	10	2.5	

Front end operated power chucks

3VKCHP 110/130/160/200



Rotary air facility through spindle.

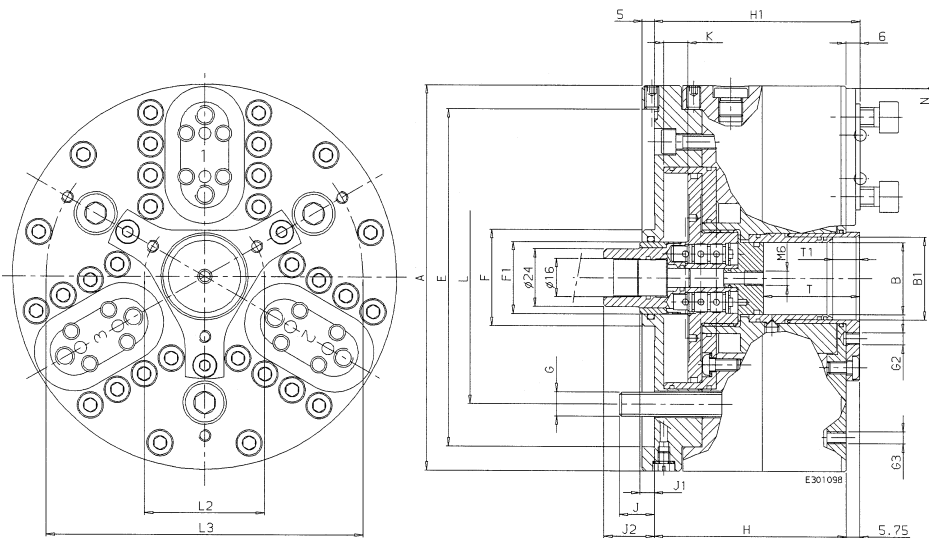
Functions and applications

- Integrated power-operated cylinder with safety valves maintains clamping force even after pneumatic failure.
- For cylindrical grinding machines with a spindle opening of at least 16 mm.
- For external and internal chucking.
- Pneumatic feed for chucking and releasing with third connection for coolant or air sensing.
- Ideal for use in confined spaces.
- Partial through hole chucking capability.

Advantages at a glance

- Maximum TIR repeatability (in 2 μm range).
- Precise chucking with pressure control.
- Easy spindle mounting.
- Maximum availability due to freedom from maintenance, permanent lubrication and quick jaw changing without adjustment.
- Machine-friendly, compact size; lightweight for low inertia.
- Long service life, wear-free.

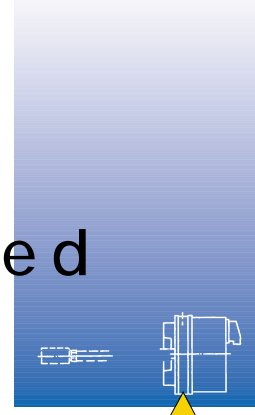
Chuck type	max. actuating force bar	min. chucking power daN	max. chucking power daN	Permissible speed 1/min	Weight kg	Mass moment of inertia kgm ²
3VKCHP 110-12	6	50	250	2500	3.5	0.006
3VKCHP 130-22	8	50	400	2500	5.5	0.011
3VKCHP 160-30	8	50	650	2250	8.1	0.026
3VKCHP 200-40	8	50	1000	2000	12.3	0.062



Chuck type	Ident. No.	Chuck size	Spindle mount	Chuck height		Bore				Diameter				Mounting screws Threads/Pitch circle diameter								Piston stroke	Jaw stroke	
				H	H1	B	T	B1	T1	E	F	F1	J1 max	J2 max	G	L	J	G2	L2	G3	L3			
3VKCHP 110	Z25540	110	Z3	68.5	74.5	12	36	16.5	H ⁷	11	95	H ⁶	23	14	31	M10	70.6	16	M4	26	M4	97	6	1.25
3VKCHP 130	Z24842	130	Z4	70	76	22	34	26.5	H ⁷	11	115	H ⁶	40	30	31	M10	82.6	14.5	M5	36	M4	97	8	1.5
3VKCHP 160	Z24843	160	Z5	80	86	30	40	34.5	H ⁷	11	140	H ⁶	40	30	31	M10	104.8	14.5	M5	50	M5	132	10	2.5
3VKCHP 200	Z24932	198	Z6	82	88	40	40	44.5	H ⁷	11	170	H ⁶	50	40	31	M12	133.4	18	M5	58	M6	176	10	2.5

Fully front end operated power chucks

3VEKCHP 110/130/160/200



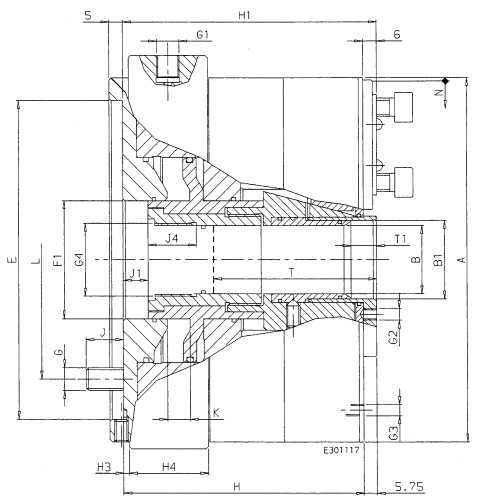
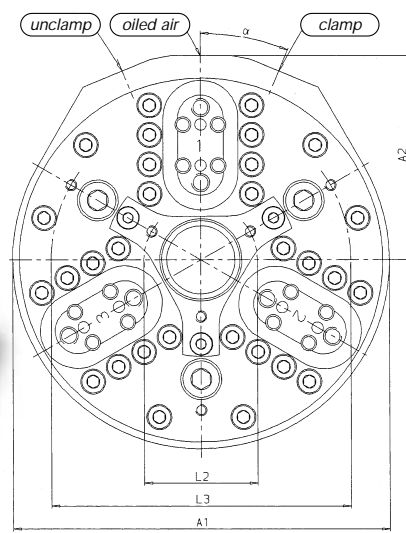
Functions and applications

- Integrated power-operated cylinder and air supply ring.
- For external and internal chucking.
- Safety valve maintains clamping pressure even after pneumatic failure.
- For cylindrical grinding machines without spindle opening or for use in confined spaces.
- Large bore enables hollow chucking.

Advantages at a glance

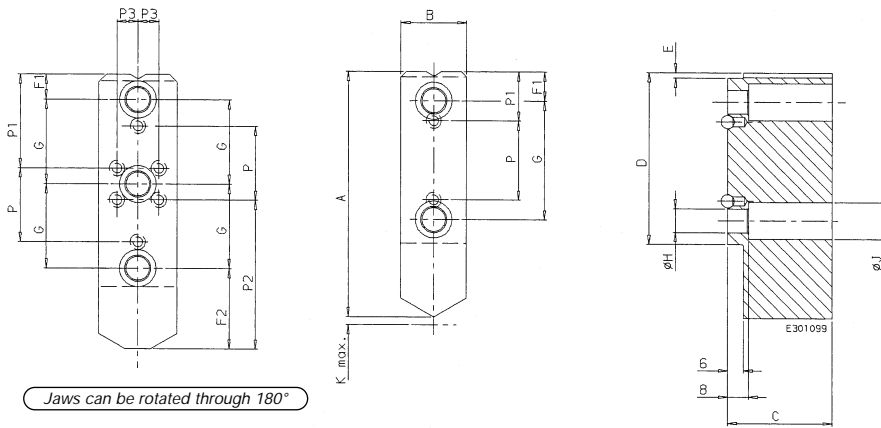
- Maximum TIR repeatability (in 2 µm range).
- Precise chucking, power control.
- Easy spindle mounting.
- Maximum availability due to freedom from maintenance, permanent lubrication and quick jaw changing without adjustment.
- Machine-friendly, compact size; lightweight for low inertia.
- Long service life, wear-free.
- Through spindle, coolant or air sensing.

Chuck type	max. actuating force bar	min. chucking power daN	max. chucking power daN	Permissible speed 1/min	Weight kg	Mass moment of inertia kgm ²
3 VEKCHP 110-12	6	50	200	2500	3.5	0.006
3 VEKCHP 130-22	8	50	350	2500	5.5	0.011
3 VEKCHP 160-30	8	50	600	2250	8	0.025
3 VEKCHP 200-40	8	50	900	2000	12	0.06



Chuck type	Ident. No.	Chuck size			Spindle mount	Chuck height				Bore				Diameter				Mounting screws Threads/Pitch circle diameter								Piston stroke	Jaw stroke		
		A	A1	A2		C	H	H1	H3	H4	B	T	B1	T1	E	F1	J1max	G	L	J	G2	L2	G3	L3	G4			L4	K
3VEKCHP 110	Z200006	110	116	65	Z3	88.5	94.5	2.5	35	12	55	16.5	H ⁷	11	95	H ⁶	28	8	M10	70.6	14	M4	26	M4	97	M14x1.5	15	6	1.25
3VEKCHP 130	Z200007	130	136	75	Z4	96	102	2.5	35	22	62	26.5	H ⁷	11	115	H ⁶	42	9	M10	82.6	16.5	M5	36	M4	97	M24x1.5	17	8	1.5
3VEKCHP 160	Z12391	160	166	90	Z5	106	112	2.5	35	30	72	34.5	H ⁷	11	140	H ⁶	52	11	M10	104.8	16.5	M5	50	M5	132	M32x1.5	21	10	2.5
3VEKCHP 200	Z100002	198	204	110	Z6	110	116	2.5	37	40	74	44.5	H ⁷	11	170	H ⁶	62	11	M12	133.4	15	M5	58	M6	176	M42x1.5	21	10	2.5

Soft top jaws

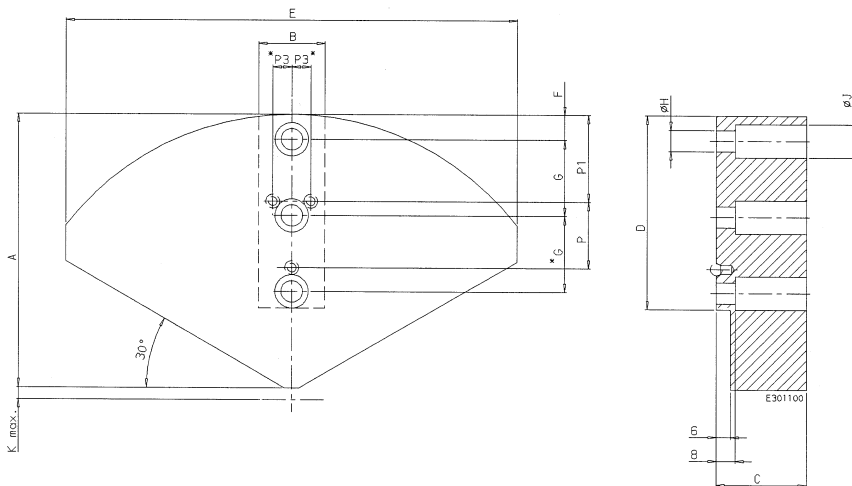


Soft top jaws for inside and outside chucking

Size	Jaw type	Ident. No.	A	B	C	D	E	F1	F2	G	H	J	K	P	P1	P2	P3	min. Chuck dia.
110	KCHP-WBCK	300251	50	18	28	33.75	2	18				7	11	1.5	23			1
130	KCHP-WBCK	38758	61.5	20	30	43	2	10.5		24	9	14	2	12				1.5
160	KCHP-WBCK	38746	74	25	35	51	2	10		33	9	14	3	18				2
200	KCHP-WBCK	39069	93	25	40	65	2	11		45	9	14	3	30				2
250	KCHP-WBCK	38752	104	30	40	80.5	2.5	9.5	30.5	32	9	14	15	28	35.5	56.5	8	28

Soft top jaws only for outside chucking

Size	Jaw type	Ident. No.	A	B	C	D	F1	G	H	J	K	P	min. Chuck dia.
110	KCHP-WBCK	300526	50	18	28	33.75	18		7	11	1.5	23	1
130	KCHP-WBCK	300527	61.5	20	30	43	10.5	24	9	14	2	12	1.5
160	KCHP-WBCK	39474	74	25	35	51	10	33	9	14	3	18	2
200	KCHP-WBCK	300528	93	25	40	65	11	45	9	14	3	28	2



Segment jaws of aluminium

Size	Jaw type	Ident.-No.	A	B	C	D	E	F	G	H	J	K	P	P1	P3
110	KCHP-SBAL	300403	47	18	28	31.75	80	16			7	11	2.5	23	4.5
130	KCHP-SBAL	38759	57.5	22	30	40.5	96	8	24	9	14	3.5	12	14	
160	KCHP-SBAL	38747	71.5	26	36	50	120	9	33	9	14	4.5	18	15.5	
200	KCHP-SBAL	39070	80	26	40	64	150	9.5	45	9	14	5	30	15.5	
250	KCHP-SBAL	24790	115	28	38	81.5	190	10.5	64	9	14	5	28	36.5	8

Form-ground chuck and jaw connections available on request.

Clamping attachments type SA

(automatic drive dog • patent pending)

Functions and applications

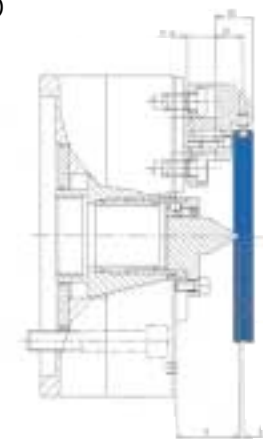
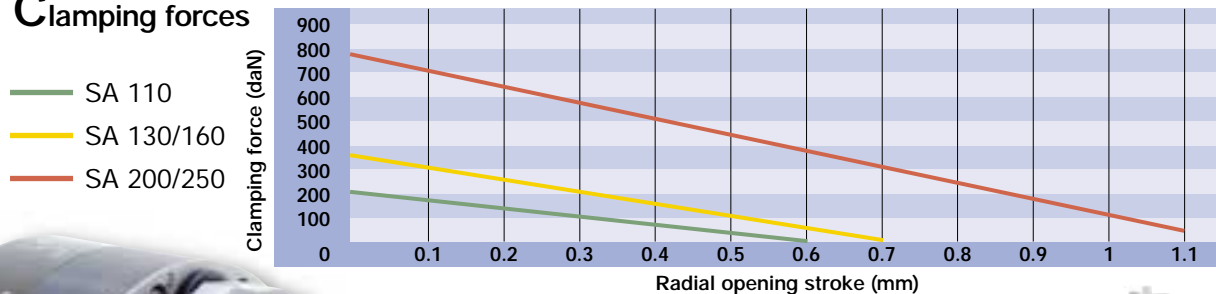
Suitable for small and large batch production.

A centric clamping chuck can be converted to machine between centres with the fitment of an easily mounted clamping ring and centre. When the chuck is actuated, the jaws press radially inwards and bend the ring in such a way that the workpiece can be mounted. When the chuck is "opened", the clamping ring rests on the workpiece and exerts the available residual bending force to provide the necessary driving torque.

Advantages at a glance

- No excessive clamping forces acting on the workpiece.
- More than sufficient driving torque for cylindrical grinding operations.
- Fast time-saving conversion of jaw chucks to between centre mounting.
- "Drive dog" for automated production.
- Low weight, low inertia.
- Wide clamping range (variable).
- Special types available on request.

Clamping forces

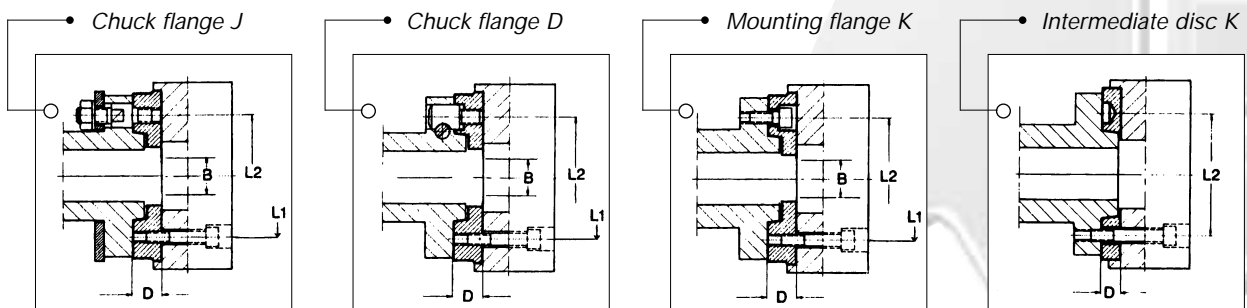


Clamping attachment		Chuck size						
		110	130	160	200		250	
Clamping ring		110	130	160	200		250	
Centre attachment	Designation	SA 110	SA 130	SA 160	SA 200-1	SA 200-2	SA 250-1	SA 250-2
Special jaws	Ident. No.	25744	24944	24945	24946	24946	25662	25662
Clamping capacity		5-50	5-50	5-50	6-60	58-100	6-60	58-100
Height of centres	S	28	28	32	36	36	36	36
Depth of jaw	A1	13	14	14	20	20	20	20
Depth of jaw	A2	17	19	19	27	27	27	27
Distance of gripping position to centre	X	To be defined by the user						
When ordering, please specify depth of intermediate jaw. Determination as follows:								
Depth of intermediate jaw	H _{ZB}	H _{ZB} = X + S - A1 - 6						

Standard chuck flanges and intermediate discs

• For mounting

power-operated chuck on short taper spindles according to DIN, ISO and ASA standard.



Chuck types 3 KCHP 3 VKCHP 3 VEKCHP	Spindle nose size	J Chuck flange with bayonet mounting for spindle noses DIN 55022, DIN 55027, ISO 702/III								D Chuck flanges with camlock mounting for spindle nose DIN 55029, ISO 702/II, ASA B5.9 D1							
		Flange type	Ident. No.	B	D	L1	L2	Staybolts and flange nuts Ident. No.	N	Flange type	Ident. No.	B	D	L1	L2	Camlock-bolts Ident. No.	N
110		on request								on request							
130	3	FF 115-J3		45	18	82.6	75	70503	3	FF 115-D3		45	26	82.6	70.6	70510	3
130	4	FF 115-J4	154532	45	18	82.6	85	70504	3	FF 115-D4	154559	45	26	82.6	70.6	70511	3
160	4	FF 140-J4	74085	50	18	104.8	85	70504	3	FF 140-D4	74118	50	28	104.8	82.6	70511	3
160	5	FF 140-J5	74086	50	24	104.8	104.8	70505	4	FF 140-D5	74119	50	30	104.8	104.8	70512	6
200	5	FF 170-J5	74089	60	24	133.4	104.8	70505	4	FF 170-D5	74122	60	30	133.4	104.8	70512	6
200	6	FF 170-J6	74090	65	28	133.4	133.4	70506	4	FF 170-D6	74123	63	35	133.4	133.4	70513	6
250	6	FF 220-J6	74096	80	28	171.4	133.4	70506	4	FF 220-D6	74129	80	35	171.4	133.4	70513	6
250	8	FF 220-J8	74097	80	32	171.4	171.4	70507	4	FF 220-D8	74130	80	40	171.4	171.4	70514	6

Chuck types 3 KCHP 3 VKCHP 3 VEKCHP	Spindle nose size	K Mounting flange including mounting screws for spindle noses DIN 55021/55026 Form A and B, ISO 702/I A1 and A2, ASA B5.9 A1 and A2							K Mounting flanges for spindle noses DIN 55021/55026 Form A and B, ISO 702/I A1 and A2, ISO 702/I A1 and A2, ASA B5.9 A1 and A2			
		Intermediate flange type	Ident. No.	B	D	L1	L2	Associated screws DIN 912 10.9	Intermediate disc type	Ident. No.	D	L1
110		on request							on request			
130	3	ZWF 115-K3		45	18	82.6	70.6	3xM10x20	ZWS 115-K3	150016	12	82.6
130	4											
160	4	ZWF 140-K4	74053	50	18	104.8	85	3xM10x20				
160	4	ZWF 140-K4	44757	50	18	104.8	82.6	3xM10x20				
160	5								ZWS 140-K5	74035	14	104.8
200	5	ZWF 170-K5	74056	60	24	133.4	104.8	4xM10x25				
200	6								ZWS 170-K6	74036	15	133.4
250	6	ZWF 220-K6	74060	80	28	171.4	133.4	4xM12x30				
250	8								ZWS 220-K8	74038	17	171.4

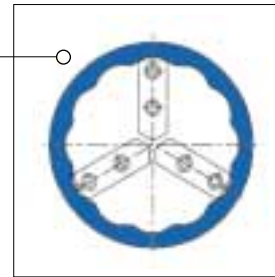
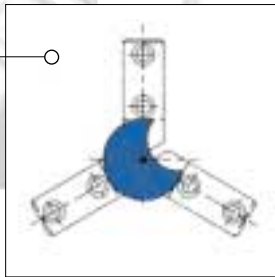
Pretension discs/rings, chuck simulator and actuating cylinder.

- **For grinding the clamping locations of top jaws for chucks 3 KCHP, 3 VKCHP and 3 VEKCHP**

- **Pretension discs** (and rings) serve for pre-tensioning the top jaws to enable their gripping positions to be ground under a specific pretension directly on a cylindrical grinding machine. Pretension discs are designed for external

chucking. They consist of a set of discs, which vary by 0.25 mm in diameter, enabling the total jaw stroke to be accommodated.

- **Pretension rings** are designed for internal chucking.



Chuck size	110	130	160	200	250
Pretension discs Ident. No.	KCHP-VSA 110 300404	KCHP-VSA 130 38757	KCHP-VSA 160 38748	KCHP-VSA 200 39071	KCHP-VSA 250 38755
Pretension rings Ident. No.	KCHP-VSI 110 300405	KCHP-VSI 130 38760	KCHP-VSI 160 24786	KCHP-VSI 200 24942	KCHP-VSI 250 24788

- **Chuck simulator for preparing the gripping positions of top jaws**

The chuck simulator serves for turning soft top jaws. It can be mounted either on a three-jaw chuck or on a magnetic chuck. The gripping positions should be turned with about 0.2 mm grinding allowance.



Chuck type	Chuck simulator type	Ident. No.	Outside dia. mm	Mount	Height mm
110	KCHP-SF	300401	110	Z 3	30
130	KCHP-SF	38953	150	Z 5	30
160	KCHP-SF	38953	150	Z 5	30
200	KCHP-SF	24943	190	Z 5	30
250	KCHP-SF	25659	240	Z 8	30

- **Actuating cylinder**

Clamping cylinder suitable for chucks type 3 KCHP.

Chuck type		3 KCHP 110	3 KCHP 130	3 KCHP 160	3 KCHP 200	3 KCHP 250
Pneumatic	Hollow clamping cylinder PZLHM*	155-22/13.5	155-22/13.5	155-22/13.5 180-34/20	155-22/13.5 180-34/20	180-34/20
	Pneumatic cylinder PZRJ/PZRJK**	90	90	90/120	90/120	90/120
Hydraulic	Hydraulic cylinder OKRJ/OKRJK***	75/90	75/90	75/90	75/90	90

Legend: * Publication No.: 428.01, ** Publication No.: 423.01, *** Publication No.: 427.10

Further efficient solutions:

- **Power-operated chuck for gear production**

Gear chuck jaws with mounted clamping pinion or toothed segment jaws with axial taper allow exact workpiece chucking in a pitch circle.

By interchanging the clamping parts, all workpiece modules and tooth numbers can be taken into account.



- **Power-operated chuck for cam and crankshafts**

Considerable experience has been accumulated by FORKARDT in gripping these unstable workpieces which need to be mounted between centres without high torques (of up to 150 Nm) compromising workpiece geometry. Standard TIR < 3 µm.



- **Special power-operated chuck for concentric and eccentric chucking**

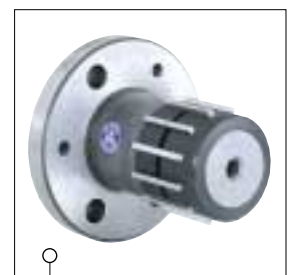
Eccentric chuck variants:

- Fixed offset mass.
- Manually offset and adjustable mass.
- Automatic adjustment from concentric to eccentric position.



- **Multi-blade chucking system for workpieces sensitive to distortion:**

- Draw-in collet chuck for **external chucking**.
- Mandrels for **internal chucking** with perfect chucking geometry.



We will be pleased to provide cost-effective solutions tailored to your specific process requirements on request.

Workholding and toolholding solutions are our business.



For more information, visit our website at:

www.forkardt.com

F O R K A R D T I N T E R N A T I O N A L

FORKARDT INTERNATIONAL
 Verwaltung und Zentrallager:
 Heinrich-Hertz-Str. 7
 D-40699 Erkrath
 Tel.: (+49) 211-25 06-0
 Fax: (+49) 211-25 06-221

FORKARDT SCHWEIZ AG
 Industriestr. 3
 CH-8307 Effretikon
 Tel.: (+41) 52-355 3131
 Fax: (+41) 52-343 5240

FORKARDT ITALIA S.r.l.
 Via Bruxelles, 33
 I-24040 Zingonia-Verdellino
 (BG)
 Tel.: (+39) 035-88 32 57
 Fax: (+39) 035-88 52 86

FORKARDT FRANCE S.A.R.L.
 28 Avenue de Bobigny
 F-93135 Noisy le Sec Cédex
 Tel.: (+33) 1-41 83 12 40
 Fax: (+33) 1-48 40 47 59

FORKARDT GREAT BRITAIN LTD
WORKHOLDING
 Tower Lane, Warmley
 Bristol, BS30 8XF
 Tel.: (+44) 117-947-7600
 Fax: (+44) 117-961-0096

FORKARDT GREAT BRITAIN LTD
TOOLHOLDING
 Grovelands Industrial Estate
 Longford Road, Exhall
 Coventry, CV7 9ND
 Tel.: (+44) 24-76 64-59 99
 Fax: (+44) 24-76 64-40 81

BUCK FORKARDT INC.
 4169 Commercial Ave.
 Portage, MI 49002-9701,
 USA
 Tel.: (+1) 616-327-8200
 Fax: (+1) 616-327-5588
 Sales: 800-228-2825

FORKARDT DEUTSCHLAND GmbH
 Postfach 34 42
 D-40684 Erkrath
 Tel.: (+49) 211-25 06-0
 Fax: (+49) 211-25 06-221