

FORKARDT

FNC

*Power Chucks with
Quick Change Jaw System*



WORKHOLDING SOLUTIONS WORLDWIDE

This catalogue describes all components of the FNC universal, quick jaw change, power chucking system.

Should you require further information beyond the data contained in this catalogue, please refer to the following FORKARDT publications:

Chuck jaws

Rotating Actuating Cylinders:

OKRJ closed-centre hydraulic cylinders

OMHJ open-centre hydraulic cylinders

Controllers

Accessories for power chucks

Gripping Force Meters

SKM 1200 / 1500

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Actuating cylinder
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As we are constantly striving to improve our products, the dimensions and specifications in this catalogue cannot always represent the latest state of the art; they are therefore given as an indication only and are not binding.

3 FNC Power chucks

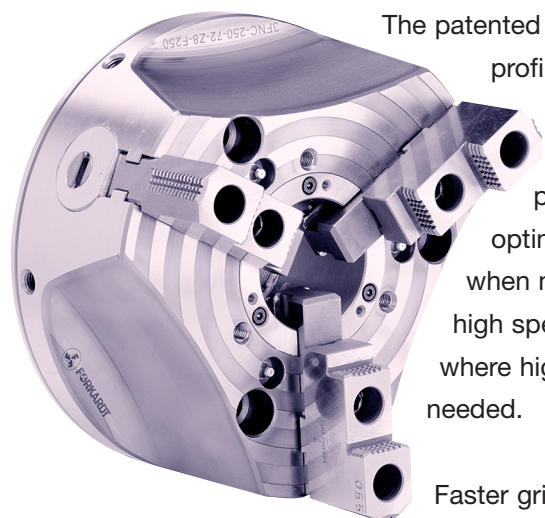


Power operated chuck with quick change jaw system in 3-jaw configuration

The FNC universally applicable power chucks belong to the most efficient and flexible chucks of the FORKARDT range of products. The unique advantage of this type is its quick change jaw system.

The frequent change-over of jaws when processing small size batches continues with this chuck to be economical, due to minimum set-up times needed.

Furthermore, sets of jaws that are already used with the proven manual chucks type F or F+ are 100 % compatible with FNC jaws.



The patented wedge hook profile permits transfer of enormous gripping forces and optimum efficiency when machining at high speeds, especially where high accuracy is needed.

Faster gripping on FNC chucks than on customary quick change jaw chucks is possible due to the shorter stroke of the central actuator for the same jaw movement.

Many possibilities for mounting the FNC exist due to the modular design - thus ensuring compatibility to all common machine spindles.

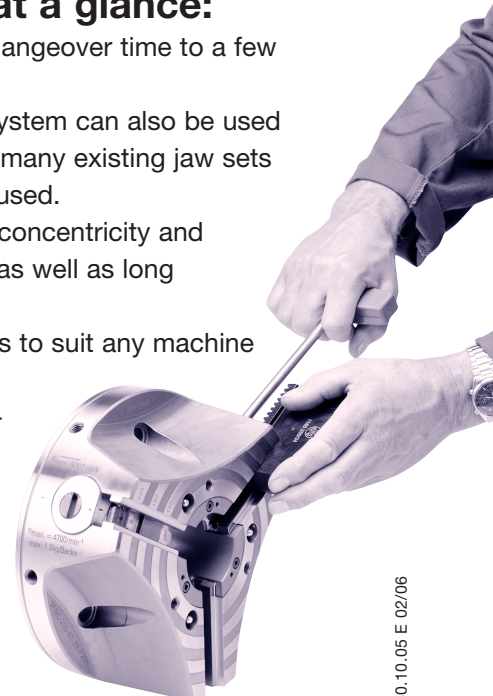
And of course, all FORKARDT chucks are manufactured from highest quality materials and are produced in accordance with the requirements of ISO 9001:2000.

Technical Features:

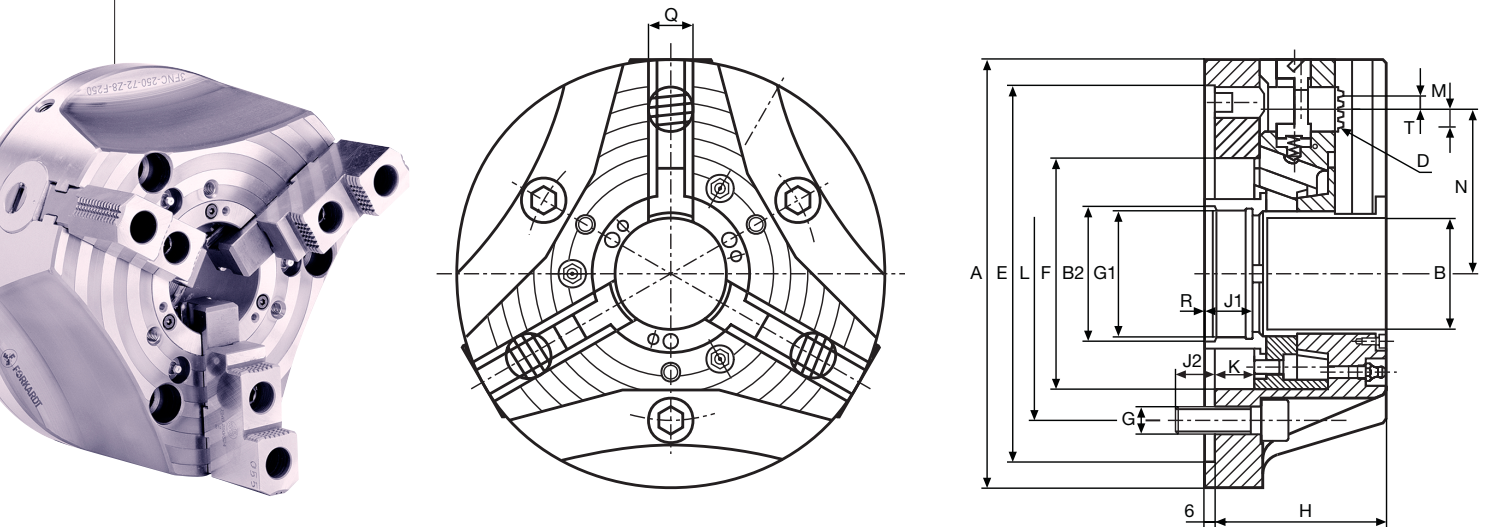
- Optimum production efficiencies due to minimal jaw changeover times.
- Highest gripping forces and extreme accuracy.
- High grade, specially heat treated chuck body – one-piece, high strength and highly rigid construction – slim design with weight reducing cutouts.
- Mounting flanges for short taper mounting are available.
- FNC chucks may be equipped with standard jaws (hard or soft), claw jaws or special jaws.

Advantages at a glance:

- Reduction of jaw changeover time to a few seconds.
- Well proven F jaw system can also be used on FNC chucks, so many existing jaw sets can continue to be used.
- Closely maintained concentricity and repetitive accuracy as well as long service life
- Mounting accessories to suit any machine spindle.
- Extremely high gripping forces due to patented heavy duty, trapezoidal wedge hook actuation.



3 FNC Power chucks



Dimensions / Performance data 3 FNC power chucks

| Type | 3 FNC | | 175-42 | 200-45 | 250-72 | 315-82 | 400-92 | 500-125 | 630-125 |
|---------------------------------|---------------------|------------------|------------|------------|------------|------------|------------|------------|------------|
| Dimensions | | | | | | | | | |
| Outer diameter | A | mm | 180 | 206 | 257 | 315 | 400 | 500 | 630 |
| Bore | B | mm | 42 | 45 | 72 | 82 | 92 | 125 | 125 |
| Chuck mounting/Mounting recess | C / E | mm | Z5 / 140 | Z6 / 170 | Z8 / 220 | Z11 / 300 | Z11 / 300 | Z15 / 380 | Z15 / 380 |
| Jaw mounting | D | | F 160 | F 200 | F 250 | F 250 | F 315 | F 400 | F 400 |
| Pitch of serration | T | | 4,8 | 4,8 | 6,0 | 6,0 | 7,0 | 8,5 | 8,5 |
| Actuator Ø | F | mm | 90 | 106 | 140 | 150 | 192 | 230 | 230 |
| Mounting bolts | G | | M 10 | M 12 | M 16 | M 20 | M 20 | M 24 | M 24 |
| Thread mounting | G ^{*)} | | M 50 x 2 | M 52 x 2 | M 80 x 2 | M 92 x 2 | M 100 x 2 | M 135 x 2 | M 135 x 2 |
| Chuck width | H | mm | 78 | 83 | 100 | 100 | 127 | 138 | 138 |
| Thread length | J ₁ | mm | 22 | 22 | 28 | 28 | 28 | 28 | 28 |
| Thread length | J ₃ | mm | 15 | 18 | 24 | 30 | 30 | 36 | 36 |
| Actuator stroke | K | mm | 20 | 20 | 23 | 23 | 28 | 33 | 33 |
| Pitch circle | L | mm | 104,8 | 133,4 | 171,4 | 235,0 | 235,0 | 330,2 | 330,2 |
| Jaw stroke | M | mm | 7,2 | 7,2 | 8,3 | 8,3 | 10,0 | 12,0 | 12,0 |
| Jaw width | Q | mm | 20 | 22 | 26 | 26 | 32 | 45 | 45 |
| Mounting recess thread mounting | P ^{H7} | mm | 51 | 53 | 81 | 94 | 102 | 136 | 136 |
| Width | R | mm | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Performance data | | | | | | | | | |
| Max. actuating force | F _{max} | daN | 3.000 | 4.500 | 6.000 | 6.000 | 10.000 | 12.000 | 12.000 |
| Max. gripping force | F _{spmax} | daN | 5.500 | 8.400 | 12.000 | 12.000 | 19.500 | 24.000 | 24.000 |
| Max. speed | n _{max} | U / min | 7.000 | 6.300 | 4.500 | 4.000 | 3.300 | 2.200 | 1.700 |
| Max. weight top jaw | ** | kg / pc. | 0.22 | 0.34 | 0.74 | 0.74 | 2.24 | 3.6 | 3.6 |
| Max. jaw height top jaw | ** | mm | 40 | 45 | 58 | 58 | 65 | 85 | 85 |
| Weight | G | kg | 11 | 15 | 24 | 37 | 68 | 115 | 200 |
| Moment of inertia | kg / m ² | kgm ² | 0,04 | 0,09 | 0,20 | 0,50 | 1,50 | 4,00 | 11,00 |
| Chuck constant | C1 | mm | 390 | 412 | 580 | 780 | 940 | 1200 | 1760 |
| | C2 | mm | 213 | 221 | 290 | 390 | 482 | 600 | 880 |
| | C3 | kgm | 0,065 | 0,09 | 0,187 | 0,33 | 0,73 | 1,66 | 2,80 |
| Ident-Number | | | | | | | | | |
| 3 FNC | | | D159570000 | D159571000 | D159427000 | D159572000 | D159575000 | D159577000 | D159578000 |

*) Other dimensions on request

**) Limit value for max. speed

Whereby the operating gripping force F_{sp0} at idle (at speed n = 0) is:

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

Terms used in the equation:

F_{sp} = operating gripping force [daN], the sum of the gripping forces of the jaws at operation.

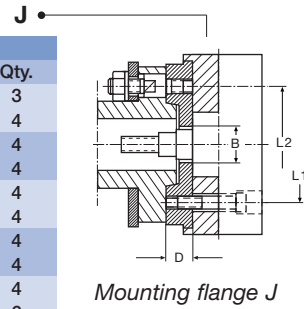
C 1, C 2, C 3 = Chuck constants

Fax = Actuating force [daN]

Mounting flanges and adaptor plates:

Flanges with bayonet plate attachment for mounting on spindle J noses to DIN 55022, DIN 55027, ISO 702 / III

| Chuck type | Spindle nose Size | Flange type | Ident-No. | Dimensions | | | | Studs and collar nuts | | |
|------------|----------------------|-------------|-------------|------------|----|-------|-------|-----------------------|-------------|------|
| | | | | B | D | L1 | L2 | FN | Ident-No. | Qty. |
| FNC | 4 | FF140-J4 | D1074085000 | 50 | 18 | 104,8 | 85,0 | 322 | D1070504000 | 3 |
| | 5 | FF140-J5 | D1074086000 | 50 | 24 | 104,8 | 104,8 | 322 | D1070505000 | 4 |
| 200 | 5 | FF170-J5 | D1074089000 | 60 | 24 | 133,4 | 104,8 | 322 | D1070506000 | 4 |
| | 6 | FF170-J6 | D1074090000 | 65 | 28 | 133,4 | 133,4 | 322 | D1070506000 | 4 |
| 250 | 6 | FF220-J6 | D1074096000 | 80 | 28 | 171,4 | 133,4 | 322 | D1070506000 | 4 |
| | 8 | FF220-J8 | D1074097000 | 80 | 32 | 171,4 | 171,4 | 322 | D1070507000 | 4 |
| 315-82 | 6 | FF220-J6 | - | 100 | 28 | 171,4 | 133,4 | 322 | D1070506000 | 4 |
| | 8 | FF220-J8 | - | 100 | 32 | 171,4 | 171,4 | 322 | D1070507000 | 4 |
| 400 | 8 | FF300-J8 | D1074103000 | 90 | 32 | 235,0 | 171,4 | 322 | D1070507000 | 4 |
| | 11 | FF300-J11 | D1074104000 | 90 | 35 | 235,0 | 235,0 | 322 | D1070508000 | 6 |
| 500 | 11 | FF380-J11 | D1074107000 | 120 | 35 | 330,2 | 235,0 | 322 | D1070508000 | 6 |
| | 15 | FF380-J15 | D1074108000 | 120 | 42 | 330,2 | 330,2 | 324 | D1070517000 | 6 |
| 630 | 11 | FF380-J11 | D1074107000 | 120 | 35 | 330,2 | 235,0 | 322 | D1070508000 | 6 |
| | 15 | FF380-J15 | D1074108000 | 120 | 42 | 330,2 | 330,2 | 324 | D1070517000 | 6 |

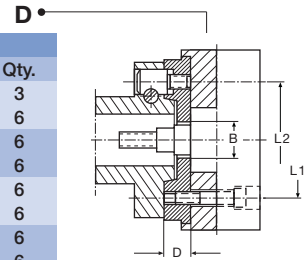


Mounting flange J

Order code example: 1 mounting flange type FF 170-J6, Ident. No. D1074090000; 1 set of studs with collar nuts size 6, Ident-No. D1070506000

Flanges with camlock attachment for mounting on spindle D noses to DIN 55029, ISO 702 / II, ASA B 5.9 D1

| Chuck type | Spindle nose Size | Flange type | Ident-No. | Dimensions | | | | Camlock studs | | |
|------------|----------------------|-------------|-------------|------------|----|-------|-------|---------------|-------------|------|
| | | | | B | D | L1 | L2 | GN | Ident-No. | Qty. |
| FNC | 4 | FF140-D4 | D1074118000 | 50 | 28 | 104,8 | 82,6 | 286 | D1070511000 | 3 |
| | 5 | FF140-D5 | D1074119000 | 50 | 30 | 104,8 | 104,8 | 287 | D1070512000 | 6 |
| 200 | 5 | FF170-D5 | D1074122000 | 60 | 30 | 133,4 | 104,8 | 287 | D1070512000 | 6 |
| | 6 | FF170-D6 | D1074123000 | 65 | 35 | 133,4 | 133,4 | 288 | D1070513000 | 6 |
| 250 | 6 | FF220-D6 | D1074129000 | 80 | 35 | 171,4 | 133,4 | 288 | D1070513000 | 6 |
| | 8 | FF220-D8 | D1074130000 | 80 | 40 | 171,4 | 171,4 | 289 | D1070514000 | 6 |
| 315-82 | 6 | FF220-J6 | - | 100 | 35 | 171,4 | 133,4 | 288 | D1070513000 | 6 |
| | 8 | FF220-J8 | - | 100 | 40 | 171,4 | 171,4 | 289 | D1070514000 | 6 |
| 400 | 8 | FF300-D8 | D1074136000 | 90 | 40 | 235,0 | 171,4 | 289 | D1070514000 | 6 |
| | 11 | FF380-D11 | D1074137000 | 90 | 45 | 235,0 | 235,0 | 290 | D1070515000 | 6 |
| 500 | 11 | FF380-D11 | D1074140000 | 120 | 45 | 330,2 | 235,0 | 290 | D1070516000 | 6 |
| | 15 | FF380-D15 | D1074141000 | 120 | 50 | 330,2 | 330,2 | 291 | D1070516000 | 6 |
| 630 | 11 | FF380-D11 | D1074140000 | 120 | 45 | 330,2 | 235,0 | 290 | D1070516000 | 6 |
| | 15 | FF380-D15 | D1074141000 | 120 | 50 | 330,2 | 330,2 | 291 | D1070516000 | 6 |

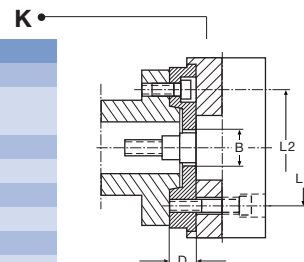


Mounting flange D

Order code example: 1 mounting flange type FF 170-D6, Ident-No. D1074123000; 1 set of camlock studs size 6, Ident-No. D1070513000

Adaptor flanges including mounting bolts for spindle noses to DIN 55021 A/B, DIN 55026 A/B, ISO 702/I A1/A2, ASA B5.9 A1/A2

| Chuck type | Spindle nose Size | Flange type | Ident-No. | Dimensions | | | | Mounting bolts | |
|------------|----------------------|-------------|------------|------------|----|-------|-------|----------------|------|
| | | | | B | D | L1 | L2 | DIN 912 | 10.9 |
| FNC | 4 | ZWF140-K4 | D164905000 | 50 | 18 | 104,8 | 85,0 | 3 x M10 x 20 | |
| | 4 | ZWF140-K4 | D164906000 | 50 | 18 | 104,8 | 82,6 | 3 x M10 x 20 | |
| 200 | 5 | ZWF170-K5 | D164907000 | 60 | 24 | 133,4 | 104,8 | 4 x M10 x 25 | |
| 250 | 6 | ZWF220-K6 | D162896000 | 80 | 28 | 171,4 | 133,4 | 4 x M12 x 30 | |
| 315-82 | 6 | ZWF220-K6 | D162896000 | 100 | 28 | 171,4 | 133,4 | 4 x M12 x 30 | |
| 315-82 | 8 | ZWF300-K8 | D164908000 | 90 | 32 | 235,0 | 171,4 | 4 x M16 x 35 | |
| 400 | 8 | ZWF300-K8 | D164908000 | 90 | 32 | 235,0 | 171,4 | 4 x M16 x 35 | |
| 500 | 11 | ZWF380-K11 | D164909000 | 120 | 35 | 330,2 | 235,0 | 6 x M20 x 40 | |
| 630 | 11 | ZWF380-K11 | D164909000 | 120 | 35 | 330,2 | 235,0 | 6 x M20 x 40 | |



Adaptor flange ZWF

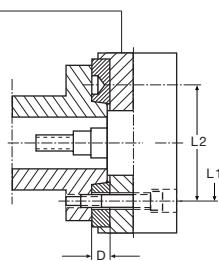
■ DIN 55021 pitch circle diameter 85 mm ● DIN 55026 pitch circle diameter 82.6 mm

Order code example: 1 adaptor flange ZWF140-K4, Ident-No. D44757000

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

| Chuck type | Spindle nose Size | Flange type | Ident-No. | Dimensions | | |
|------------|----------------------|-------------|-------------|------------|-------|----|
| | | | | D | L2 | L* |
| FNC | 5 | ZWS140-K5 | D1074035000 | 14 | 104,8 | 10 |
| 200 | 6 | ZWS170-K6 | D1074036000 | 15 | 133,4 | 15 |
| 250 | 8 | ZWS220-K8 | D1074038000 | 17 | 171,4 | 15 |
| 315 | 8 | ZWS220-K8 | D1074038000 | 17 | 171,4 | 15 |
| 400 | 11 | ZWS300-K11 | D1074040000 | 19 | 235,0 | 20 |
| 500 | 15 | ZWS380-K15 | D1074042000 | 21 | 330,2 | 20 |
| 630 | 15 | ZWS380-K15 | D1074042000 | 21 | 330,2 | 20 |

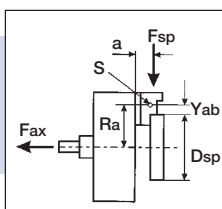
K A2



Adaptorplate ZWS

* The length of the chuck mounting bolts must be increased by the amount "L" when using these adaptor plates!

Order code example: 1 adaptor plate ZWS140-K5, Ident-No. D1074035000



n = Speed [min⁻¹]
 Ma = Total - Centrifugal moment of the jaws [kgm]
 = ∑ G x Ra
 Dsp = Gripping Diameter [mm]

Yab = Centre of gravity of the top jaw to the Gripping Diameter [mm]
 a = Jaw overhang [mm]
 G = Weight of one jaw [kg]
 Ra = Distance from the centre of gravity of the top jaw to the chuck centre [mm]

Actuating cylinders

Hydraulic hollow cylinders are used to generate actuating forces for power chucks. The new FORKARDT OMHJ series is ideal for strong and delicate clamping at all speeds.

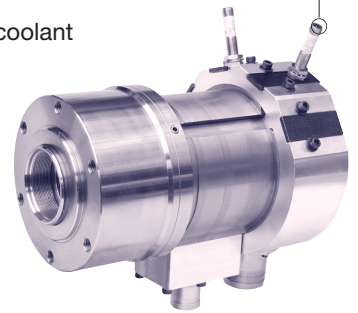
Key Features:

- Compact reliable, modular design
- Short overall length for easy fitment to lathes
- Advanced bearing and seals design
- Competitive pricing

Other FORKARDT accessories available include:

- Hydraulic cylinders OMHJ (for open centre - clamping).
- Draw tubes and bars, cylinder flanges (machine - related).
- Hard and soft top standard – jaws.
- Roughing jaws.
- Special grease keeping the clamping force.
- Lapping plates for the maintenance of fine serration of chuck jaws.
- Special chuck jaws (workpiece – related)

- Highly precise oil feed and coolant drainage systems
- Balanced to class Q = 2.5
- Alternate controlled safety of non-return valves
- Clamping stroke monitoring included as standard
- Continuous clamping stroke monitoring as option
- Developed and produced under ISO 9001:2000



*FORKARDT OMHJ
Hydraulic through hole
cylinder*

Gripping force meters

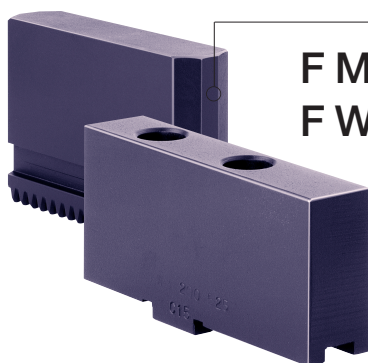
To ensure the reliable, safe and accurate operation of all chucking systems an accurate gripping force meter is essential. The FORKARDT SKM products are quick, precise and inexpensive.



*Gripping force
meters
SKM 1200 / 1500*

Chuck jaws

Power Chucks of the FNC series are delivered with the jaws of your choice:

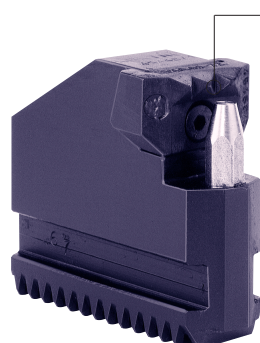


FMB
FWB

Soft top jaws

Soft jaws (type FMB / FWB) are used for the accurate clamping of already machined work pieces, on which clamping surfaces should not be damaged.

These jaws are turned, by the user, under clamping pressure, to the respective clamping diameter to ensure extremely high accuracy and repeatability.

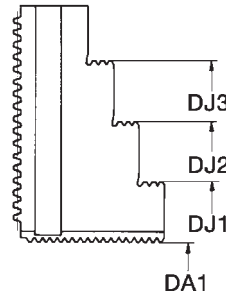
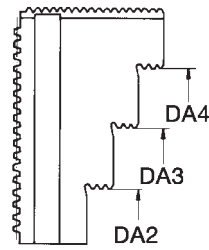
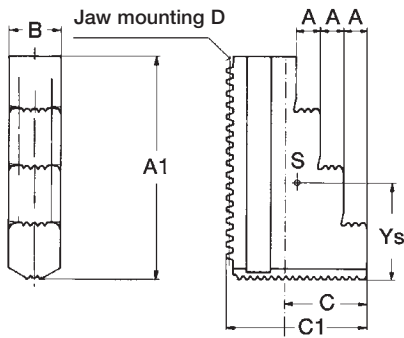


KBKTNC

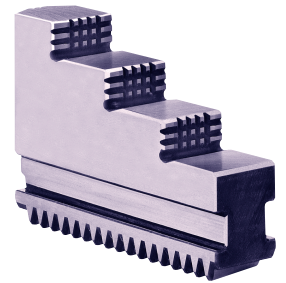
Roughing jaws

For heavy duty machining of overhanging workpieces roughing jaws KBKTNC with replaceable chucking claws SKA (for external clamping) and SKI (for internal clamping) are available.

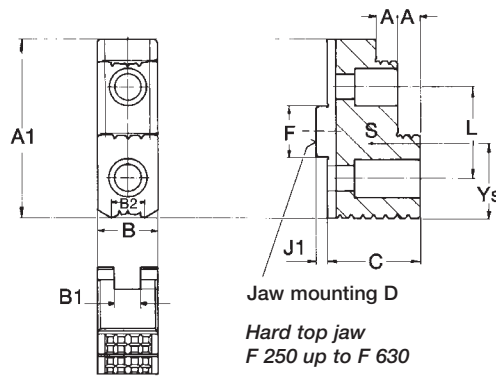
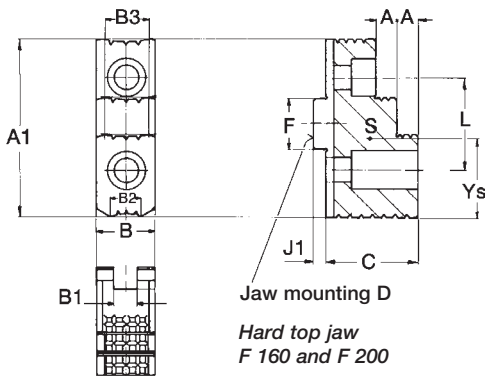
The chucking claws provide safest gripping even on short clamp surfaces.



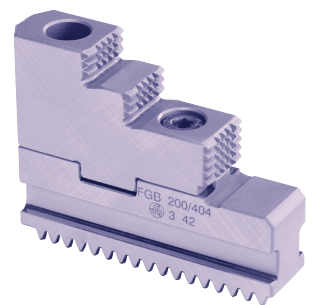
FSTB



| Chuck type UKFST | Max. swing diameter | Jaw type | Nominal dimensions | | | | Ident-No. | | | | | | For external chucking | | | | For internal chucking | | | Distance to gravity center Ys | Weight kg/each |
|------------------|---------------------|----------|--------------------|----|----|------|-------------|-----|------|----|-------|----|-----------------------|-----------------|-----------------|-----------------|-----------------------|-----------------|-----------------|-------------------------------|----------------|
| | | | A | B | C | D | | a1 | a2 | a3 | a4 | c1 | DA ₁ | DA ₂ | DA ₃ | DA ₄ | DJ ₁ | DJ ₂ | DJ ₃ | | |
| 175 - 42 | 234 | 160 | 7,5 | 20 | 24 | F160 | D1070016633 | 79 | 23 | 43 | 63 | 45 | 8-65 | 59-108 | 99-148 | 138-188 | 63-112 | 102-152 | 142-192 | 35,5 | 0,350 |
| 200 - 45 | 273 | 200 | 10 | 22 | 35 | F200 | D1070021633 | 94 | 24 | 48 | 72 | 60 | 8-76 | 69-128 | 116-176 | 164-224 | 65-124 | 113-173 | 160-220 | 41,0 | 0,615 |
| 250 - 65 | 346 | 250 | 14 | 26 | 40 | F250 | D1070026533 | 115 | 39,7 | - | 79,9 | 70 | 10-101 | 96-181 | - | 175-261 | 96-182 | - | 176-262 | 53,0 | 1,090 |
| 250 - 72 | | | | | | | | | | | | | 10-137 | 96-217 | - | 175-297 | 96-218 | - | 176-298 | | |
| 315 - 65 | | | | | | | | | | | | | 10-137 | 96-217 | - | 175-297 | 96-218 | - | 176-298 | | |
| 315 - 82 | 377 | | | | | | | | | | | | 40-202 | 106-276 | - | 216-386 | 109-278 | - | 218-388 | 59,0 | 1,770 |
| 400 - 85 | 462 | 315 | 15 | 32 | 46 | F315 | D1070033533 | 129 | 37,5 | - | 92,8 | 81 | 40-202 | 106-276 | - | 216-386 | 109-278 | - | 218-388 | 59,0 | 1,770 |
| 400 - 92 | | | | | | | | | | | | | 40-236 | 150-357 | - | 272-480 | 152-367 | - | 274-480 | 75,5 | 3,600 |
| 500 - 125 | 586 | 400 | 20 | 45 | 52 | F400 | D1070038533 | 167 | 52,5 | - | 113,8 | 93 | 110-339 | 150-459 | - | 272-582 | 152-460 | - | 274-582 | | |
| 630 - 125 | 690 | | | | | | | | | | | | 110-339 | 150-459 | - | 272-582 | 152-460 | - | 274-582 | 75,5 | 3,600 |



FGB/FHB



| Chuck type UKF | Max. swing diameter | Jaw type | Nominal dimensions | | | | Ident-No. | | | | | | | For external chucking | | | | For internal chucking | | | Distance to gravity center Ys | Weight kg/each |
|----------------|---------------------|----------|--------------------|----|------|------|-----------|-------------|-----|------|------|------|-----------------|-----------------------|-----------------|-----------------|-----------------|-----------------------|-----------------|------|-------------------------------|----------------|
| | | | A | B | C | D | Base jaw | Top jaw | a1 | a2 | a3 | c1 | DA ₁ | DA ₂ | DA ₃ | DA ₄ | DJ ₁ | DJ ₂ | DJ ₃ | | | |
| 175 - 42 | 234 | 160 | 7,5 | 30 | 38,5 | F160 | D70016504 | D1070016624 | 67 | 33,1 | 46,2 | 59,5 | 8-65 | 59-108 | 99-148 | 138-188 | 63-112 | 102-152 | 142-192 | 33,9 | 0,217 | |
| 200 - 45 | 273 | 200 | 10 | 30 | 45 | F200 | D70021504 | D1070021624 | 75 | 33,7 | 47,8 | 70 | 8-76 | 69-128 | 116-176 | 164-224 | 65-124 | 113-173 | 160-220 | 40,3 | 0,340 | |
| 250 - 65 | 346 | 250 | 14 | 32 | 57 | F250 | D70026404 | D1070026524 | 90 | 40,4 | 80,6 | 90,5 | 10-101 | 96-181 | - | 175-261 | 96-182 | - | 176-262 | 48,5 | 0,740 | |
| 250 - 72 | | | | | | | | | | | | | 10-137 | 96-217 | - | 175-297 | 96-218 | - | 176-298 | | | |
| 315 - 65 | | | | | | | | | | | | | 10-137 | 96-217 | - | 175-297 | 96-218 | - | 176-298 | | | |
| 315 - 82 | 378 | | | | | | | | | | | | 40-202 | 106-276 | - | 216-386 | 109-278 | - | 218-388 | 55,3 | 2,240 | |
| 400 - 85 | 462 | 315 | 15 | 36 | 64 | F315 | D70033404 | D1070026524 | 106 | 37,0 | 91,3 | 99 | 40-202 | 106-276 | - | 216-386 | 109-278 | - | 218-388 | 55,3 | 2,240 | |
| 400 - 92 | | | | | | | | | | | | | 40-236 | 150-357 | - | 272-480 | 152-367 | - | 274-480 | 75,5 | 3,600 | |
| 500 - 125 | 586 | 400 | 20 | 45 | 85 | F400 | D70038404 | D1070038524 | | | | | 110-339 | 150-459 | - | 272-582 | 152-460 | - | 274-582 | | | |
| 630 - 125 | 686 | | | | | | | | | | | | 110-339 | 150-459 | - | 272-582 | 152-460 | - | 274-582 | 75,5 | 3,600 | |