



Face Drivers FFB / FFBH

**with drive pins and fixed center pin
for high true run accuracy**

The entire surface of the workpiece can be completely machined with one single clamping and with a maximum of torque transmission. NEIDLEIN face drivers are mechanical clamping systems, suitable **for turning and hard turning** likewise.

Face drivers of type FFB / FFBH are power-operated on the side of the machine spindle as well as the side of the tailstock. The workpieces are clamped centrically by the fixed center pin. This operation results in high true run-out accuracy.

Drive pins of type FFBH are hydraulically activated and compensated, thus achieving excellent true run-out accuracy.

Type FFB with flange retainer

Type FFB is mounted onto the machine spindle nose using flange-adapter, adjustable for true run-out.



Type FFBH with flange retainer

Type FFBH is mounted onto the machine spindle nose using flange-adapter adjustable for true run-out.



NEIDLEIN face drivers FFB / FFBH with fixed center pin ensure:

- maximum of torque transmission, thus achieving a high rate of metal removing
- datum-point location in the center of the workpiece ensures constant measures of length
- extended service life of drive pins and cutting tools due to vibration-free running
- run-out deviation max.: 0.002 - 0.01 mm
- fixed clamping location
- compensating driving devices/ideal clamping of the workpiece
- easy handling

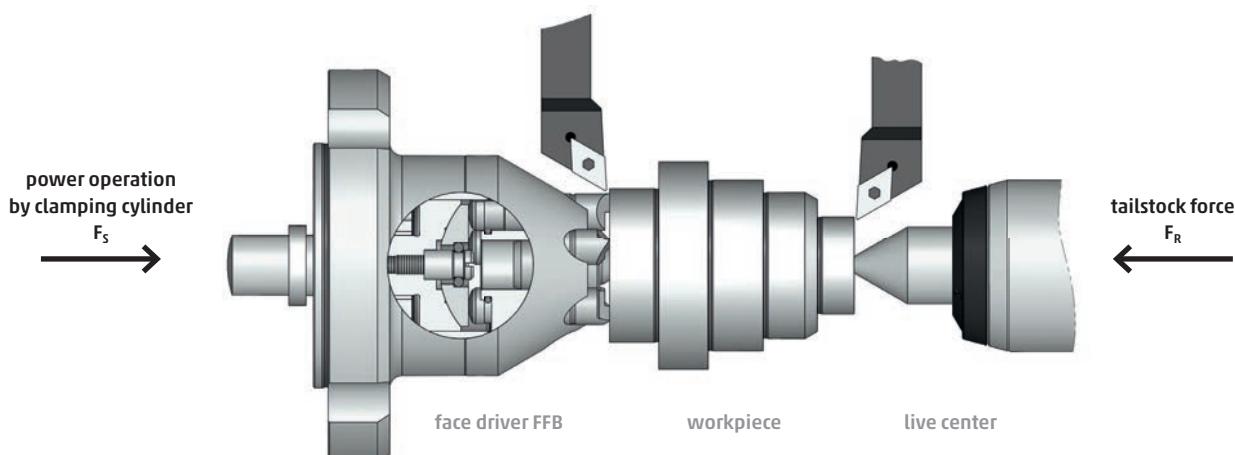
Clamping principle

The center pin located on the side of the tailstock pushes the workpiece against the fixed center pin of the face driver. The motion of the drive pins against the surface of the workpiece is initiated by the clamping cylinder mounted into the machine. The drive pins are "floatingly" suspended, thus compensating irregularities with regard to possible unevenness of the surface of workpieces. The datum-point of workpieces on the machines is determined by the size of the center hole. The entire surface of the workpiece can now be tooled in one single clamping.

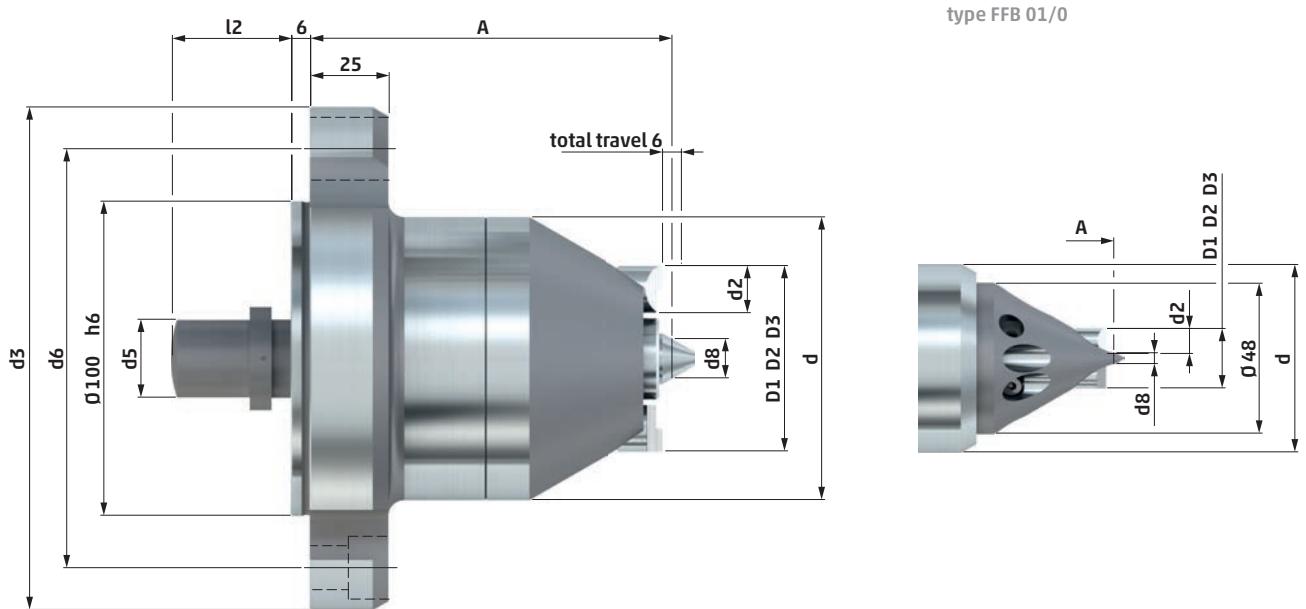
See page 20 - 21 with data for achievable removal of material and the thrust requested. The appropriate standard drive pins and center pins can be found on page 22 - 27 and page 29.

We will be glad to design clamping devices suitable for your workpieces.

Type FFB / FFBH with flange retainer



Technical data - type FFB face drivers



type FFB	d	center Ø	d2	d3	d5	d6	d8	A	l2	drive pin	fastening screw type	clamping Ø			cat. no.	
												pcs	D1	D2	D3	
01	60	1 - 5	6	160	18	133.4	3.5	115	38	3	M12	3	8	11	17	731 01
0	60	1 - 3	8	160	18	133.4	3	115	38	3	M12	3	6	11	19	731 12
11	42	2 - 6.5	6	160	12	133.4	4.25	115	38	3	M12	3	11	14	20	731 11
1	48	4 - 8.5	8	160	18	133.4	6.25	115	38	3	M12	3	13	18	26	731 02
2	70	4 - 9	10	160	22	133.4	6.5	115	38	3	M12	3	26	31	36	731 03
3	70	6 - 11	10	160	22	133.4	8.5	115	38	3	M12	3	34	39	44	731 04
35	80	4 - 9	15	160	22	133.4	6.5	115	38	3	M12	3	29	39	49	731 13
4	90	10 - 15	15	160	25	133.4	12.5	115	38	5	M12	3	39	49	59	731 05
45	100	10 - 15	15	160	25	133.4	12.5	115	54	5	M12	3	49	59	69	731 06
5	132	10 - 15	20	160	25	133.4	12.5	115	54	5	M12	3	69	84	99	731 07
55	182	10 - 15	20	220	40	171.4	12.5	155	54	5	M16	3	110	125	140	731 08
6	220	10 - 15	20	250	40	210	12.5	171	54	5	M20	3	140	155	170	731 09

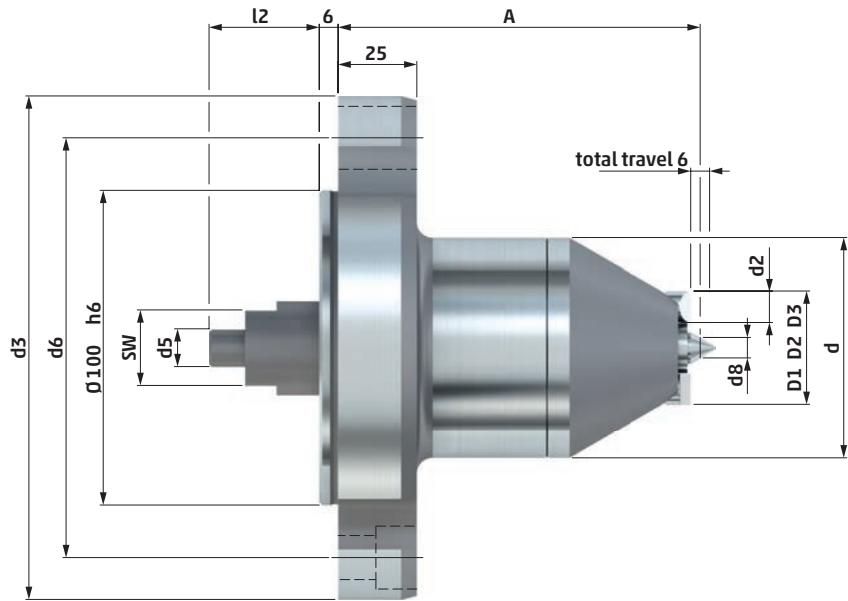
- All face drivers are supplied without drive pins. (drive pins see page 22-27)
- Types FFB 01/0 are supplied with center body, all other types without center pin. (center pin see page 29)
- The diameter d8 refers to the standard center pins. (see page 29)
- Further center pins for other center holes upon request. (see page 30)
- Mounting elements for face drivers see page 68 - 73.

It is the purpose of an adjustable flange-adapter to provide stable connection to the machine spindle. We supply these flange adapters for various sizes of spindle noses in standard size (DIN ISO 702-1/DIN 55028) or for spindle noses specific to machine-tool manufacturer. Thus face drivers of type FFB can be used all-purpose on different machines. Driving devices and center pins can be exchanged front view on the machine without any effort.

Upon request and depending on the tooling direction of the machine, the face driver can be equipped optionally with drive pins for counter-clockwise tooling (SR / tooling direction M3), for clockwise tooling (SL / tooling direction M4) or for both tooling directions (NV = bi-directional).

Apart from the clamping diameters enlisted in the table under D1, D2, D3 we can also supply intermediate dimensions upon request. We can as well make extra-large center pins or mushroom centers appropriate to oversized centerings in work-pieces. (see page 30)

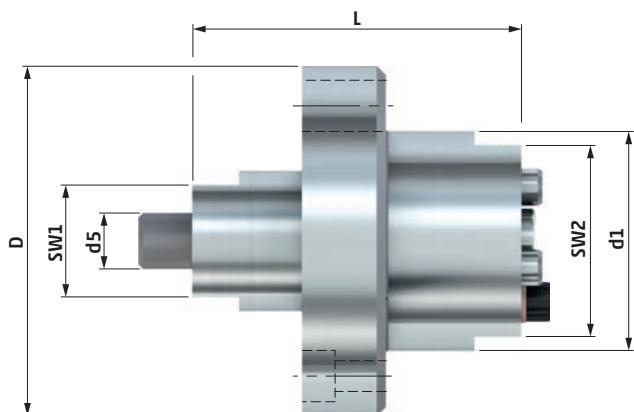
Technical data - type FFBH face drivers



type	d	center Ø	d2	d3	SW	d5	d6	d8	A	l2	drive pin	fastening screw	clamping Ø			cat. no.	
													type	pcs	D1	D2	D3
FFBH																	
1	70	4 - 8.5	8	160	24	12	133.4	6.25	115	35	3	M12	3	13	18	26	631 02
2	70	4 - 9	10	160	24	12	133.4	6.5	115	35	3	M12	3	26	31	36	631 03
3	70	6 - 11	10	160	24	12	133.4	8.5	115	35	3	M12	3	34	39	44	631 04
4	90	10 - 15	15	160	34	12	133.4	12.5	132	35	5	M12	3	39	49	59	631 06
45	100	10 - 15	15	160	34	12	133.4	12.5	132	35	5	M12	3	49	59	69	631 07
5	132	10 - 15	20	160	34	12	133.4	12.5	149	35	5	M12	3	69	84	99	631 08

- All face drivers are supplied without drive pins and without center pins. (changeable parts see page 22 - 27 and page 29)
- The diameter d_8 refers to the standard center pins. (see page 28)
- Further center pins for other center holes upon request. (see page 30)
- Mounting elements for face drivers see page 68 - 73.

Technical data- type FFBH hydraulic unit



type	SW1	d5	L	d1	SW2	D	cat. no.
1	24	12	70,5	47	41	75	631 02 HE
2	24	12	70,5	47	41	75	631 02 HE
3	24	12	70,5	47	41	75	631 06 HE
4	34	12	70,5	65	59	93	631 06 HE
45	34	12	70,5	65	59	93	631 08 HE
5	34	12	70,5	87	81	131	631 08 HE

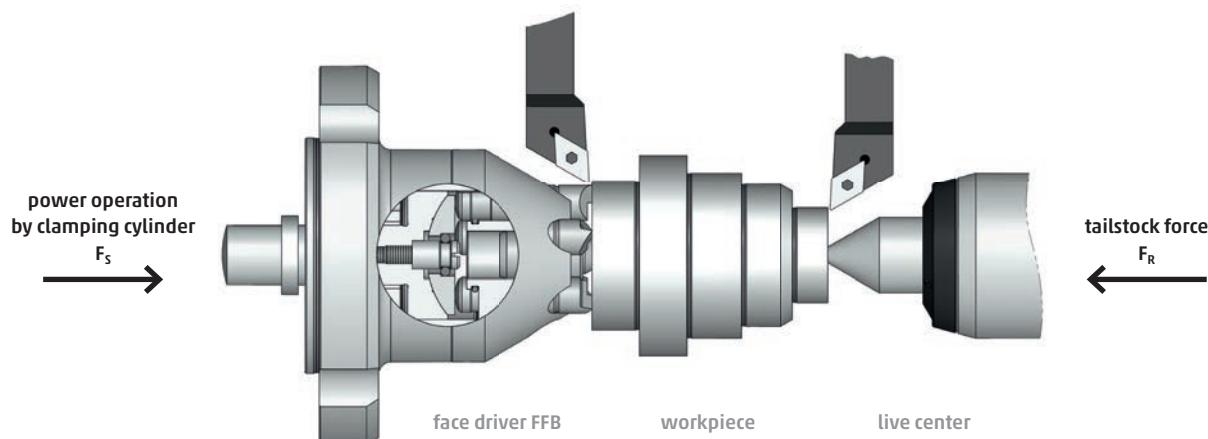
The general explanatory notes for this face driver FFBH can be obtained from the sheet "technical data - type FFB". For safe and smooth operation of face driver we recommend exchange of hydraulic unit after 1500 operating hours.

Furthermore, we offer the option for professional maintenance of the exchanged hydraulic units in our production plant.

Face Drivers FFB / FFBH · Calculations

force of clamping cylinder / maximum chip cross section

PRINCIPLE: The tailstock force pushes the workpiece against the fixed center pin of the face driver. The drive pins are activated by the clamping cylinder mounted into the machine.



■ force of clamping cylinder F_s :

The force onto the face driver required for metal removing is calculated on the basis of the empirical formula:

$$F_s = [(q_{max} \times 1100 \times \frac{D}{d}) + 1300] \times m$$

F_s	[N]	tailstock force
q_{max}	[mm ²]	maximum of chip cross section for metal removing
D	[mm]	cutting diameter
d	[mm]	clamping diameter
m	[−]	material factor (see adjustment-chart below)

■ maximum chip cross section q_{max} :

At a given force of clamping cylinder, the maximum chip cross section is calculated as follows:

$$q_{max} = \frac{\frac{F_s}{m} - 1300}{1100 \times \frac{D}{d}}$$

■ tailstock force F_R :

In case of tooling against the face driver the tailstock force has to be approx. 20 % more than the force of the clamping cylinder F_s .

In case of tooling against the tailstock, the tailstock should be approx. 40 - 50 % higher than the force of the clamping cylinder, if not, then the chip cross section should be reduced by approx. 30 %. (as there is an addition of force of clamping cylinder and cutting force).

EXPLANATORY NOTES: The first chip, however, should always be machined toward the face driver, in order to achieve an ideal penetration of the drive pins. The ratio D/d should not exceed 2, otherwise it would work inefficiently.

Material factor m adjustment chart:

material factor m	1.4	1.2	1.1	1.0	0.8
Rm [N/mm ²]	1000	800	700	600	400
examples	42CrMo4	16MnCr5	C 15E (Ck 15)	S355J0	S235J0
	25CrMo4	C 45E (Ck 45)		35S20	

Chisel load of drive pins

Keep the chisel load within the following range:

250 - 350 N per mm chisel length

- the chisel load is calculated as follows:

$$BS = \frac{F_s}{n \times s}$$

EXEMPLIFICATION: turning with FFB 3 face driver, 3 drive pins respective length of chisel 7 mm, force of clamping cylinder 6300 N

$$BS = \frac{4500 \text{ N}}{3 \times 5 \text{ mm}} = 300 \frac{\text{N}}{\text{mm}}$$

BS	[N/mm]	chisel load
F _s	[N]	force of clamping cylinder
n	[-]	number of drive pins
s	[mm]	chisel length

CALCULATION EXAMPLE for type FFB / FFBH

Specific data of machine and workpiece:

maximum force of clamping cylinder:	12000 N
material of the workpiece:	16MnCr5
diameter of the workpiece,	
side of face driver:	Ø 62 mm
tooling diameter:	Ø 120 mm

Selection of face driver:

face driver FFB 4 / clamping Ø 59 mm
5 drive pins each 7.5 mm chisel length

■ force of clamping cylinder F_s:

In order to ensure sufficient entrainment (see chisel load of drive pins), a clamping cylinder force of approx. 11250 N is needed.

$$BS = \frac{F_s}{n \times s}$$

$$F_s = 300 \frac{\text{N}}{\text{mm}} \times 5 \times 7,5 \text{ mm} = 11250 \text{ N}$$

■ maximum chip cross section q_{max}:

The maximum chip cross section (at OD-Ø) is calculated as follows:

$$q_{\max} = \frac{\frac{11250 \text{ N}}{1,2} - 1300}{1100 \times \frac{120 \text{ mm}}{59 \text{ mm}}} = 3,61 \text{ mm}^2$$

Calculation of material factor m:

as per adjustment chart material factor: m (16MnCr5) = 1.2

EXPLANATORY NOTES: The calculated chip cross section refers to the extreme outer tooling diameter. In case of further tooling towards the axis of rotation of the workpiece, even larger chip cross sections can be achieved (» formula), commensurate with turning diameter.



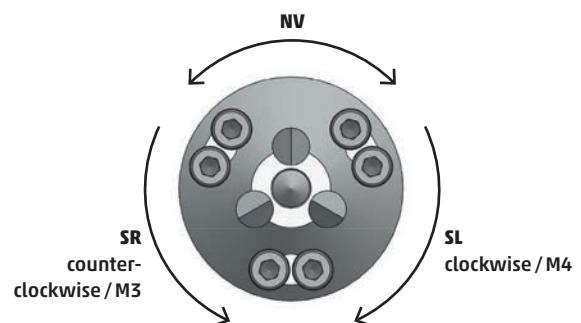
Drive Pins FSB / SB / FFB · Chisel SL / SR / NV

**for torque transmission onto the workpiece
for soft / green tooling**

Type FSB / SB / FFB · chisel SL / SR / NV

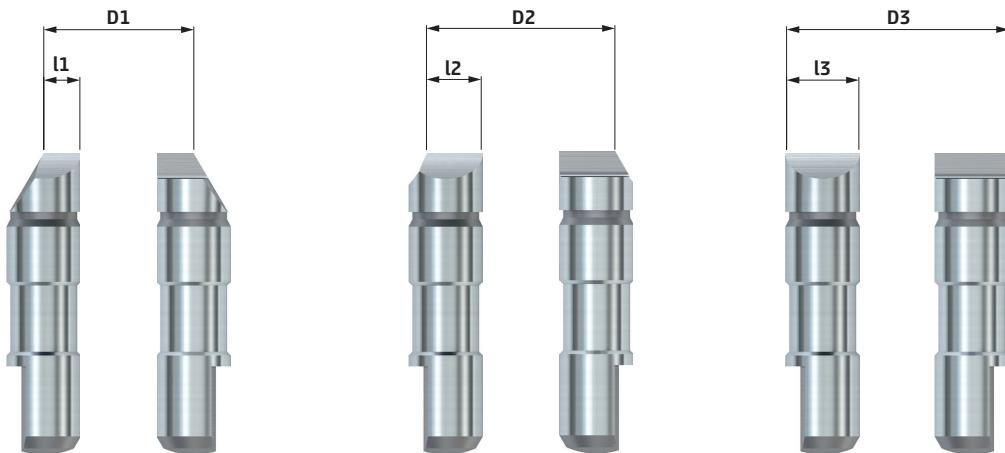


view from tailstock onto the face driver



Technical data - type FSB / SB / FFB · chisel SL / SR / NV

types 01 and 11 with chisel SL and SR are double chiselled



			TYPE CHISEL SL for tooling direction M4	TYPE CHISEL SR for tooling direction M3	TYPE CHISEL NV for tooling direction M4 and M3						
for type	clamping Ø			cat. no.	cat. no.						
	FSB / SB / FFB	D1	D2	D3	l1	l2	l3				
01		8			1.5			736 104	736 101	736 107	
			11			3		736 105	736 102	736 108	
				17		6		736 106	736 103	736 109	
0		6			1.5			736 04	736 01	736 07	
			11			4		736 05	736 02	736 08	
				19		8		736 06	736 03	736 09	
1		13			1.5			736 13	736 10	736 16	
			18			4		736 14	736 11	736 17	
				26		8		736 15	736 12	736 18	
11		11			1.5			736 76	736 73	736 79	
			14			3		736 77	736 74	736 80	
				20		6		736 78	736 75	736 81	
2		26			5			736 22	736 19	736 25	
			31			7.5		736 23	736 20	736 26	
				36		10		736 24	736 21	736 27	
3		34			5			736 31	736 28	736 34	
			39			7.5		736 32	736 29	736 35	
				44		10		736 33	736 30	736 36	
35		29			5			736 85	736 82	736 88	
			39			5		736 86	736 83	736 89	
				49		5		736 87	736 84	736 90	
4		39			5			736 40	736 37	736 43	
			49			7.5		736 41	736 38	736 44	
				59		7.5		736 42	736 39	736 45	
45		49			5			736 94	736 91	736 97	
			59			7.5		736 95	736 92	736 98	
				69		7.5		736 96	736 93	736 99	
5		69			5			73649	736 46	736 52	
			84			10		73650	736 47	736 53	
				99		10		73651	736 48	736 54	
55		110			5			73658	736 55	736 61	
			125			10		73659	736 56	736 62	
				140		10		73660	736 57	736 63	
6		140			5			73667	736 64	736 70	
			155			10		73668	736 65	736 71	
				170		10		73669	736 66	736 72	
7		180			5			736114	736 111	736 117	
			195			15		736115	736 112	736 118	
				210		20		736116	736 113	736 119	
75		230			5			736344	736 341	736 347	
			245			15		736345	736 342	736 348	
				260		20		736346	736 343	736 349	
8		270			10			736373	736 370	736 376	
			290			20		736374	736 371	736 377	
				310		30		736375	736 372	736 378	
85		320			10			736364	736 361	736 367	
			340			20		736365	736 362	736 368	
				360		30		736366	736 363	736 369	

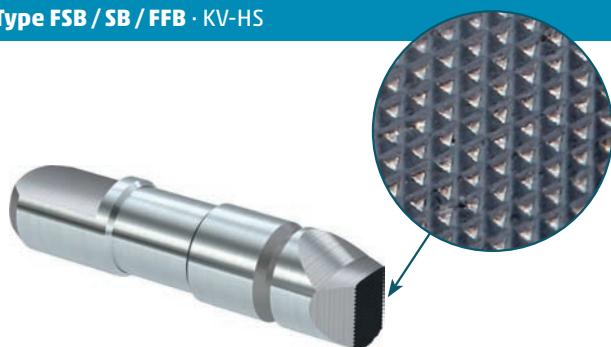
■ Further clamping Ø of drive pins upon request.



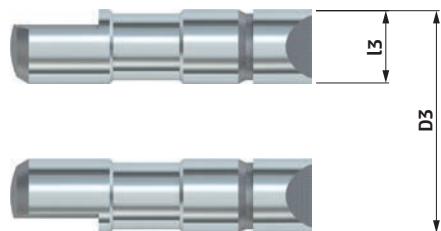
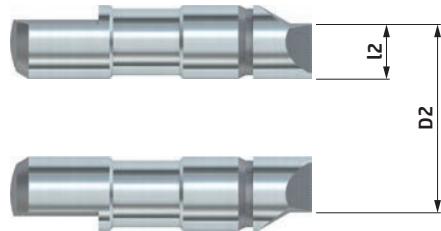
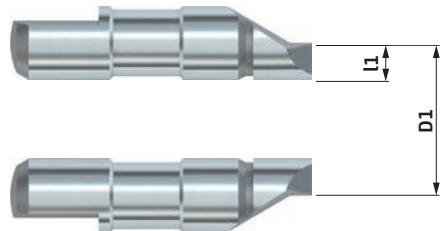
Drive Pins FSB / SB / FFB · KV-HS

**cross serrated and coated for hard turning operation
for torque transmission onto the workpiece
for hard tooling**

Type FSB / SB / FFB · KV-HS



Technical data - type FSB / SB / FFB · KV-HS



for type FSB / SB / FFB	clamping Ø			chisel length			cat. no.
	D1	D2	D3	l1	l2	l3	
	8			1.5			736 200
01		11			3		736 201
			17		6		736 202
	6			1.5			736 203
0		11		4			736 204
			19		8		736 205
	13			1.5			736 209
1		18		4			736 210
			26		8		736 211
	11			1.5			736 206
11		14		3			736 207
			20		6		736 208
	26			5			736 212
2		31		7.5			736 213
			36		10		736 214
	34			5			736 215
3		39		7.5			736 216
			44		10		736 217
	29			5			736 218
35		39		10			736 219
			49		15		736 220
	39			5			736 221
4		49		10			736 222
			59		15		736 223
	49			5			736 224
45		59		10			736 225
			69		15		736 226
	69			5			736 227
5		84		12.5			736 228
			99		20		736 229
	110			5			736 230
55		125		12.5			736 231
			140		20		736 232
	140			5			736 233
6		155		12.5			736 234
			170		20		736 235

■ Further clamping Ø of drive pins upon request.

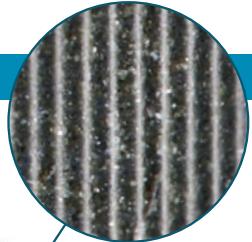


Drive Pins FSB / SB / FFB · FV Diamond

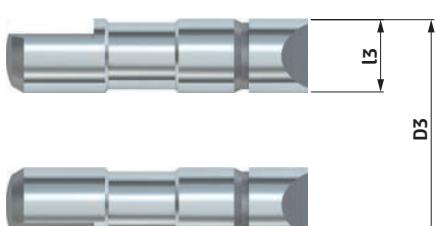
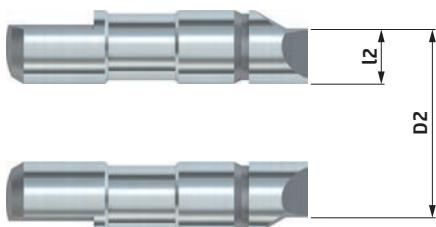
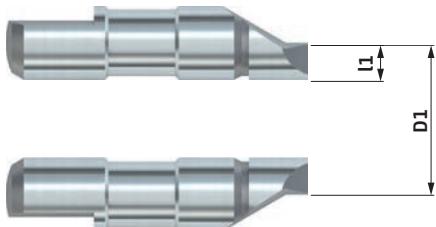
**serrated and diamond embedded
for torque transmission onto the workpiece
for hard tooling**

for higher friction coefficient and higher tool life of drive pin

Type FSB / SB / FFB · FV diamond



Technical data - type FSB / SB / FFB · FV diamond



for type	clamping Ø			chisel length		cat. no.
FSB / SB / FFB	D1	D2	D3	l1	l2	l3
01	8			1.5		736 400
		11			3	736 401
			17		6	736 402
0	6			1.5		736 403
		11			4	736 404
			19		8	736 405
1	13			1.5		736 409
		18			4	736 410
			26		8	736 411
11	11			1.5		736 406
		14			3	736 407
			20		6	736 408
2	26			5		736 412
		31			7.5	736 413
			36		10	736 414
3	34			5		736 415
		39			7.5	736 416
			44		10	736 417
35	29			5		736 418
		39			10	736 419
			49		15	736 420
4	39			5		736 421
		49			10	736 422
			59		15	736 423
45	49			5		736 424
		59			10	736 425
			69		15	736 426
5	69			5		736 427
		84			12.5	736 428
			99		20	736 429
55	110			5		736 430
		125			12.5	736 431
			140		20	736 432
6	140			5		736 433
		155			12.5	736 434
			170		20	736 435

■ Further clamping Ø of drive pins upon request.



Drive Pins FSB / SB / FFB · Chisel Carbide

**full carbide / carbide inserts
for torque transmission onto the workpiece
for tooling of high-tensile-strength materials**

Type FSB / SB / FFB · chisel carbide

model B / SR

MODEL A



SL SR NV

MODEL B

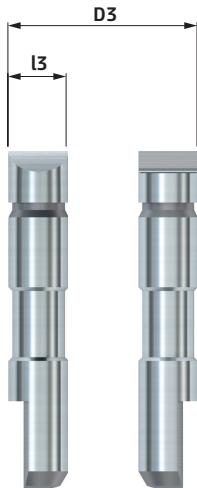


SL SR

Technical data - type FSB / SB / FFB · chisel carbide

type 01-3 made of full carbide, model A

type 35-6 with carbide inserts, model B



MODEL A

TYPE CHISEL SL
for tooling
direction M4

TYPE CHISEL SR
for tooling
direction M3

TYPE CHISEL NV
for tooling
direction M4 and M3

for type FSB / SB / FFB	clamping Ø D3	length l3	cat. no.	cat. no.	cat. no.
01	17	6	736 500	736 518	736 536
0	19	8	736 501	736 519	736 537
1	26	8	736 502	736 520	736 538
11	20	6	736 503	736 521	736 539
2	36	10	736 504	736 522	736 540
3	44	10	736 505	736 523	736 541

MODEL B

for type FSB / SB / FFB	clamping Ø D1	clamping Ø D3	length l3	cat. no.	cat. no.
35	34		6	736 506	736 524
		46	6	736 507	736 525
4	44		6	736 508	736 526
		56	6	736 509	736 527
45	54		6	736 510	736 528
		66	6	736 511	736 529
5	75		6	736 512	736 530
		95	6	736 513	736 531
55	116		6	736 514	736 532
		136	6	736 515	736 533
6	146		6	736 516	736 534
		166	6	736 517	736 535

- Drive Pins are supplied with carbide insert.
- Further clamping-Ø of drive pins upon request.

Changeable inserts for type 35 - 6, model B

changeable parts	cat. no.
carbide insert	736 550
set screw for fastening of carbide insert	736 551



Center Pins FFB / FFBH

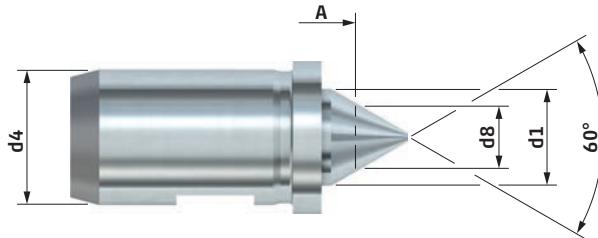
for face drivers FFB / FFBH with fixed center pin

Type FFB / FFBH · tool steel or carbide



HM with carbide insert

Technical data - type FFB / FFBH · tool steel or carbide

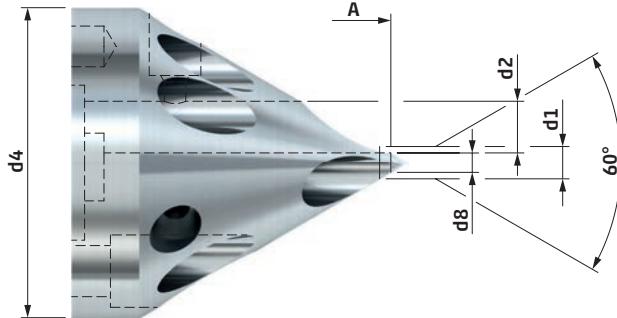


A overhang dimension of face driver
to centre d8 (see page 18-19)

center body type FSB / SB 01 / 0



center body type FSB / SB 01 / 0



**TYPE
TOOL STEEL**

**TYPE
CARBIDE**

for type FFB / FFBH	d1	d2	d4	center Ø	d8	cat. no.
01	5	6	48	1 - 5	3.5	734 01
0	3	8	48	1 - 3	3	734 101
11	7.8	-	6	2 - 6.5	4.25	734 11
1	9.8	-	8	4 - 8.5	6.25	734 02
2	10	-	14	4 - 9	6.5	734 03
3	12	-	18	6 - 11	8.5	734 04
35	10	-	14	4 - 9	6.5	734 12
4	16	-	20	10 - 15	12.5	734 05
45	16	-	28	10 - 15	12.5	734 06
5	16	-	35	10 - 15	12.5	734 07
55	16	-	35	10 - 15	12.5	734 08
6	16	-	35	10 - 15	12.5	734 09

cat. no.
734 43
734 44
734 33
734 34
734 35
734 36
734 37
734 38
734 39
734 40
734 41
734 42

■ Further center pins for other center holes upon request.

■ Center pins of type FFB / FFBH 01 / 0 (type carbide) are just carbide coated on the 60° centering.