

**Indexable insert drilling-, boring-
and finish machining tools**
可转位刀片的钻削、镗削及精加工刀具

扩孔刀具

Unicut-Eco UNWE

Preci-Cut RPC

微调单元刀具 /

Adjusting systems

RPC / RPC-G / RPK

Flexispeed FLX


Powerbore KSB / KBH

可转位刀片 /

Indexable inserts



页码 / Page

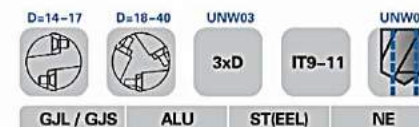
	扩孔刀具 / Boring and circular milling tool Unicut UNW D=14-40	20-22
	螺钉沉头孔刀具 / Screw head boring tool Unicut-Eco UNWE D=10-58	23-24
	精加工刀具 / Finish machining tool Preci-Cut RPC D=18-40	25-26
	微调单元 / Adjusting systems RPC / RPC-G / RPK D=16-250	27-28
	菲勒克斯深孔钻 6D / Flexispeed FLX D=18-39	29-32
	爆炮系列大孔径深孔钻 8D / Powerbore KSB / KBH D=39-160	33-36

样本仅用于展示库存中的某款刀具，其它类型都有备货。 /

The catalog shows only a part of our range of products. Many other items are available on stock or within a short delivery time too. Please call and ask for availability. The product line is subject to change without notice. Errors excepted.



UNW03

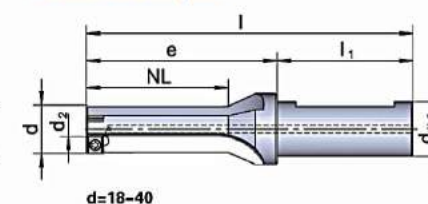
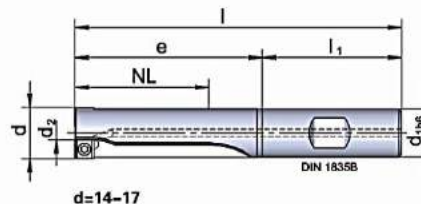


特点:




- 扩孔、扩沉头孔
- 切削力小且切削率高
- 加工精度达到(IT9-11)
- 应用范围广，适用于所有材料

Advantages:

- For spotfacing and boring
- High stock removal rates
- Tight bore tolerances (IT9-11)
- Usable on rigid machines without pilot



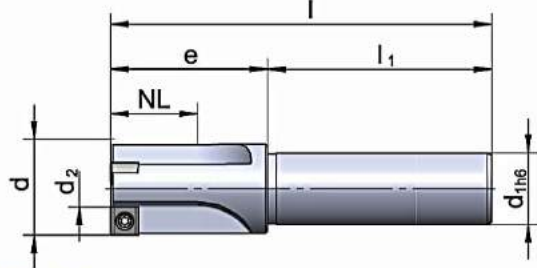
Unicut UNW03 (NL = 2-3xd)

d ₁ /-0,05*	d ₁	d ₂ *	e	l	l ₁	NL	货号/ Ord.-No			
							UNW03			
14	16	1,5	42	90	48	28	UNW03 1400	TX 25050	TX 208	06
15	16	2,5	42	90	48	30	UNW03 1500	TX 25050	TX 208	06
16	16	3,5	44	92	48	32	UNW03 1600	TX 25050	TX 208	06
17	16	4,5	44	92	48	34	UNW03 1700	TX 25050	TX 208	06
18	20	5,5	65	115	50	52	UNW03 1800	TX 25050	TX 208	06
19	20	6,5	65	115	50	53	UNW03 1900	TX 25050	TX 208	06
20	20	7,5	65	115	50	54	UNW03 2000	TX 25050	TX 208	06
21	20	8,5	65	115	50	54	UNW03 2100	TX 25050	TX 208	06
22	20	9,5	70	120	50	61	UNW03 2200	TX 25050	TX 208	06
23	20	10,5	70	120	50	61	UNW03 2300	TX 25050	TX 208	06
24	20	11,5	70	120	50	61	UNW03 2400	TX 25050	TX 208	06
25	20	12,5	70	120	50	61	UNW03 2500	TX 25050	TX 208	06
26	25	13,5	94	150	56	78	UNW03 2600	TX 25050	TX 208	06
27	25	14,5	94	150	56	78	UNW03 2700	TX 25050	TX 208	06
28	25	9,2	94	150	56	84	UNW03 2800	TX 35075	TX 215	09
29	25	10,2	104	160	56	87	UNW03 2900	TX 35075	TX 215	09
30	25	11,2	104	160	56	90	UNW03 3000	TX 35075	TX 215	09
31	32	12,2	104	160	56	93	UNW03 3100	TX 35075	TX 215	09
32	32	13,2	115	175	60	96	UNW03 3200	TX 35075	TX 215	09
33	32	14,2	115	175	60	99	UNW03 3300	TX 35075	TX 215	09
34	32	15,2	115	175	60	102	UNW03 3400	TX 35075	TX 215	09
35	32	16,2	115	175	60	105	UNW03 3500	TX 35075	TX 215	09
36	32	17,2	125	185	60	108	UNW03 3600	TX 35075	TX 215	09
37	32	18,2	125	185	60	111	UNW03 3700	TX 35075	TX 215	09
38	32	19,2	125	185	60	114	UNW03 3800	TX 35075	TX 215	09
39	32	20,2	130	190	60	117	UNW03 3900	TX 35075	TX 215	09
40	32	15	130	190	60	120	UNW03 4000	TX 45115	TX 215	12

* 尺寸和公差仅对于SCHX...FRH-和...FRZ-的刀片 /
Dimensions and tolerances for SCHX...FRH- and
...FRZ-inserts only

** 需单独订购 / order separately

可根据客户要求尺寸订制 /
Other dimensions and designs upon request



Unicut UNW (NL < 1xD)

d ₁ / -0,05*	d ₁	d ₂ *	e	l	l ₁	NL	货号 /			
							Ord.-No			
							UNW03			
14	12	1,5	30	75	45	15	UNW 140012	TX 25050	TX 208	06
15	12	2,5	30	75	45	15	UNW 150012	TX 25050	TX 208	06
16	12	3,5	30	75	45	15	UNW 160012	TX 25050	TX 208	06
17	16	4,5	35	85	50	19	UNW 170016	TX 25050	TX 208	06
18	16	5,5	35	85	50	19	UNW 180016	TX 25050	TX 208	06
19	16	6,5	35	85	50	19	UNW 190016	TX 25050	TX 208	06
20	16	7,5	35	85	50	19	UNW 200016	TX 25050	TX 208	06
21	16	8,5	35	85	50	19	UNW 210016	TX 25050	TX 208	06
22	16	9,5	35	85	50	19	UNW 220016	TX 25050	TX 208	06
23	16	10,5	35	85	50	19	UNW 230016	TX 25050	TX 208	06
24	16	11,5	35	85	50	19	UNW 240016	TX 25050	TX 208	06
25	16	12,5	35	85	50	19	UNW 250016	TX 25050	TX 208	06
26	20	13,5	40	100	60	23	UNW 260020	TX 25050	TX 208	06
27	20	14,5	40	100	60	23	UNW 270020	TX 25050	TX 208	06
28	20	9,2	40	100	60	22	UNW 280020	TX 35075	TX 215	09
29	20	10,2	40	100	60	22	UNW 290020	TX 35075	TX 215	09
30	20	11,2	40	100	60	22	UNW 300020	TX 35075	TX 215	09
31	20	12,2	40	100	60	21	UNW 310020	TX 35075	TX 215	09
32	20	13,2	40	100	60	21	UNW 320020	TX 35075	TX 215	09

其它柄部结构 / Other shanks:

(请在下单时标明 / Please indicate with order)

Whistle Notch = DIN 1835 E Weldon = DIN 1835 B



* 尺寸和公差仅对于SCHX...FRH-和...FRZ-的刀片 / Dimensions and tolerances for SCHX...FRH- and ...FRZ-inserts only

** 需单独订购 / order separately

可根据客户要求尺寸订制 / Other dimensions and designs upon request

切削参数推荐 / Cutting data recommendation:

	钢件 Steel	不锈钢 Stainless steel	铸铁 Cast iron	铝合金 Aluminum
	e.g. C45E	e.g. X20Cr13	e.g. G.J.L., GJS	e.g. AISI10Mg
硬合金 / Carbide Vc	60 - 150	40 - 90	60 - 160	100 - 500
金属陶瓷 (C1) Vc	80 - 200			100 - 500
PKD / PCD (D1) Vc				100 - 500
含钴高速钢 (S6) Vc	25 - 50	15 - 35		
φd				
14 - 27	f 0,12 - 0,3	0,1 - 0,2	0,15 - 0,3	0,2 - 0,35
28 - 40	f 0,2 - 0,4	0,15 - 0,25	0,25 - 0,5	0,25 - 0,5

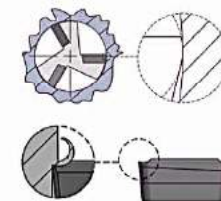
线速度 / Cutting speed
Vc (m/min)

进给 / Infeed
f (mm/rev)

需中心冷却 / Sufficient coolant supply needed

说明 / Specifications	货号 / Ord.-No	材质等级 / Material class										
		N	K	P	N	K	MKH	P	P	M	PMH	PMKS
可转位刀片 / 镗削 UNW und UNW03 / Boring inserts for UNW and UNW03												
切宽 < 0,5; / Cutting width < 0,5	09	SCHW 0903AC FRH...									K9	
切宽 < 0,5; / Cutting width < 0,5; Guiding chamfers*	06	SCHW 0602AC FRZ...									K9	
	09	SCHW 0903AC FRZ...									K9	
	12	SCHW 1204AC FRZ...									K9	
PKD; 切宽 < 2,5 bzw. 3,5 / PCD; Cutting width < 2,5 resp. 3,5	06	SCHW 060202 FRH...							D1			
	09	SCHW 090302 FRH...							D1			
	09	SCHW 090304 FRH...							D1			
PKD; 单刃 / PCD; entire cutting width	06	SCHW 060202 FR5...							D1			
	09	SCHW 090302 FR5...							D1			
	12	SCHW 120402 FR5...							D1			
带排屑槽刀片 / Ground chip breakers	06	SCHX 060204 FRH...	AK1	C1		K1	K9	P2	P5	P9		
	09	SCHX 090304 FRH...	AK1	C1		K1	K9	P2	P5	P9	S6	
	12	SCHX 120404 FRH...	AK1	C1		K1	K9	P2	P5	P9	S6	
槽口导向*; 带排屑槽 / Guiding chamfers*; ground chip breakers	06	SCHX 060202 FRZ...				K1	K9	P2	P5	P9		
	06	SCHX 060204 FRZ...	AK1	C1		K1	K9	P2	P5	P9	S6	
	09	SCHX 090304 FRZ...	AK1	C1		K1	K9	P2	P5	P9	S6	
	09	SCHX 090308 FRZ...				K1			P5	S6		
槽口导向*; 带排屑槽** 短刃 / Guiding chamfers*; chip breakers** for short chips	06	SCHX 060204 FRZ7...									P9	
	09	SCHX 090304 FRZ7...									P9	
	12	SCHX 120404 FRZ7...									P9	
可转位刀片 / 扩沉头孔 UNW und UNW03 / Spotfacing and milling inserts for UNW and UNW03												
无排屑槽 / Without chip breakers	06	SCHW 060204 FN...	K1								K9	
	09	SCHW 090304 FN...	K1								K9	P2
4pcs 排屑槽 / 4 ground chip breakers	06	SCHX 060202 FN1...	K1								P2	P5
	09	SCHX 090304 FN1...	K1								P2	P5
4pcs 排屑槽 / 4 sintered chip breakers	06	SCMT 060204 EN...	K1								K9	P2
	09	SCMT 090304 EN...	K1								K9	P2
	12	SCMT 120404 EN...	K1								K9	P5

可根据客户需求订制刀片 / Other indexable insert designs and grades upon request

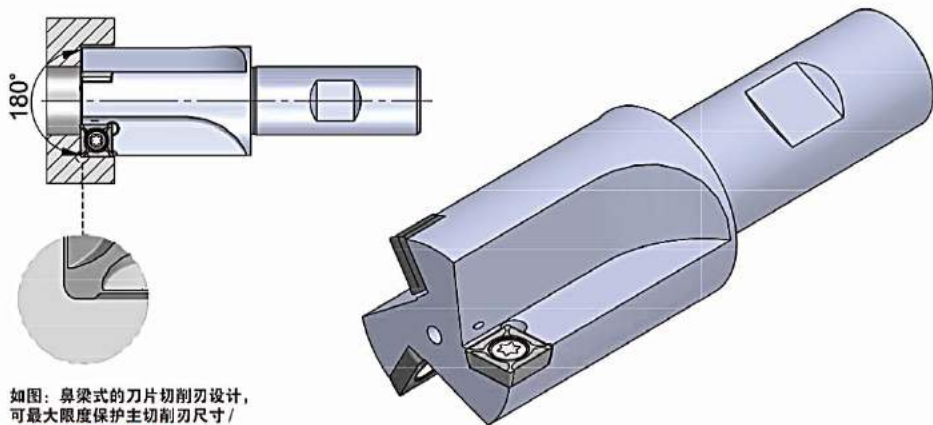
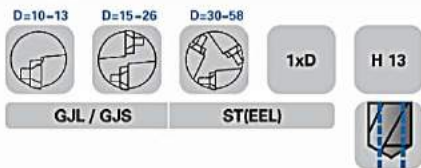


* 圆角槽口导向刀片 (...Z...) 在加工中无震刀现象, 提高工件表面光洁度
3片刀片刀具切削更稳定 / Round ground guiding chamfers on the insert (...Z...) prevent chattering and burnish the bore surface -> well suitable for lean tools with min. 3 cutting edges

** 较低的切削刃与短排屑槽 (...7...) 在低进给时产生碎屑, 更适合长屑的工件材料
Low cutting edge and short chip breakers (...7...) generate short chips already at low feed rates -> well suitable for long chipping materials



螺钉沉头孔刀具
Screw head boring tool UNWE



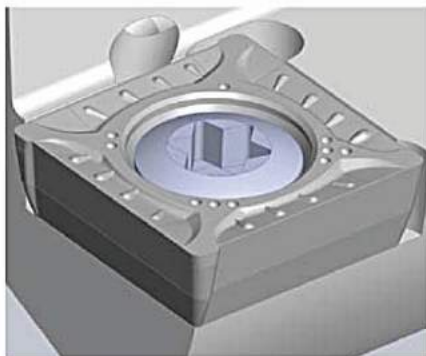
如图：鼻梁式的刀片切削刃设计，可最大限度保护主切削刃尺寸 / The "nose" on the minor cutting edge protects the major cutting edge on the external tool diameter

Vorteile:

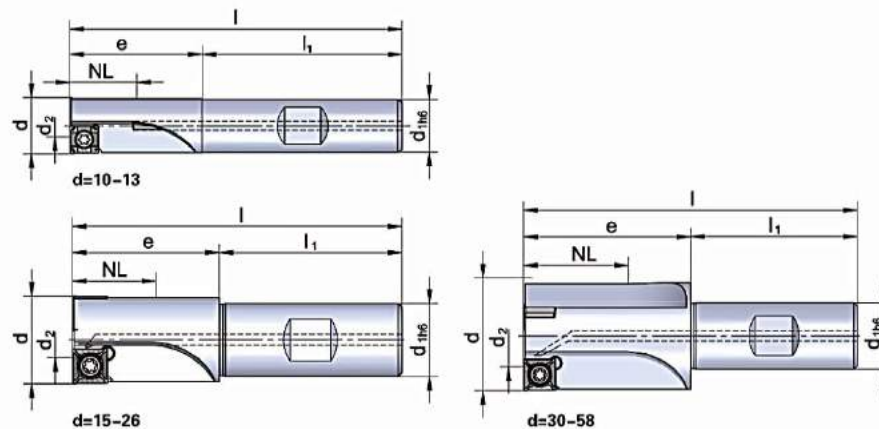
- 平头螺钉孔 180° 适用于 M5-M36
- 经济实惠、及可转位四次使用的刀片
- U9材质刀片适用于钢件与铸铁
- 应用范围广

Advantages:

- The 180° Screw head counterbore for M5 to M36
- Low priced sinter-insert SCM_X-Eco with four usable cutting edges
- Insert grade U9 is well usable for steel and cast iron
- Applicable on rigid machine tools without pilot



可转位刀片 / Insert: SCM_X-Eco



Unicut-Eco UNWE (NL < 1xD)

d _{0,3}	d ₁	d ₂	e	l	l ₁	NL	货号 /			
							Ord.-No			
UNWE										
10	12	4,5	30	75	45	6	UNWE 1000	TX 25045	TX 208	SCMX060204ERU9
11	12	4,5	30	75	45	7	UNWE 1100	TX 25045	TX 208	SCMX060204ERU9
13	12	4,5	30	75	45	7	UNWE 1300	TX 25050	TX 208	SCMX060204ERU9
15	12	5	30	75	45	13	UNWE 1500	TX 25050	TX 208	SCMX060204ERU9
16	12	6	30	75	45	13	UNWE 1600	TX 25050	TX 208	SCMX060204ERU9
18	16	8	32	80	48	15	UNWE 1800	TX 25050	TX 208	SCMX060204ERU9
20	16	10	37	85	48	20	UNWE 2000	TX 25050	TX 208	SCMX060204ERU9
24	20	8	40	90	50	21	UNWE 2400	TX 35075	TX 215	SCMX090304ERU9
26	20	10	40	100	50	21	UNWE 2600	TX 35075	TX 215	SCMX090304ERU9
30	20	14	50	100	50	31	UNWE 3000	TX 35075	TX 215	SCMX090304ERU9
33	20	17	50	100	50	31	UNWE 3300	TX 35075	TX 215	SCMX090304ERU9
36	25	20	54	110	56	31	UNWE 3600	TX 35075	TX 215	SCMX090304ERU9
40	32	24	55	115	60	36	UNWE 4000	TX 35075	TX 215	SCMX090304ERU9
46	32	30	60	120	60	41	UNWE 4600	TX 35075	TX 215	SCMX090304ERU9
50	32	28	70	130	60	50	UNWE 5000	TX 45115	TX 215	SCMX120404ERU9
54	40	32	70	140	70	50	UNWE 5400	TX 45115	TX 215	SCMX120404ERU9
58	40	36	70	140	70	50	UNWE 5800	TX 45115	TX 215	SCMX120404ERU9

** 需单独订购 / order separately

可根据客户需要尺寸订制 / Other dimensions and designs upon request

例 / Order example:

- 3支 / pieces UNWE 2400
- 10片 / pieces SCMX090304ERU9

切削参数推荐 / Cutting data recommendation:

∅ d	Vc	钢件	铸铁
		Steel	Cast iron
		e.g. C45E	e.g. GJL, GJS
		60 - 200	60 - 200
10 - 13	f	0,06 - 0,12	0,08 - 0,15
15 - 20	f	0,12 - 0,2	0,15 - 0,25
24 - 26	f	0,15 - 0,25	0,18 - 0,3
30 - 46	f	0,2 - 0,4	0,25 - 0,5
50 - 58	f	0,3 - 0,5	0,35 - 0,6

线速度 / Cutting speed
Vc (m/min)
进给 / Infeed
f (mm/rev)

需中心冷却 / Sufficient coolant supply needed



RPC 底部螺钉微调单元
RPC with eccentric pin adjustment

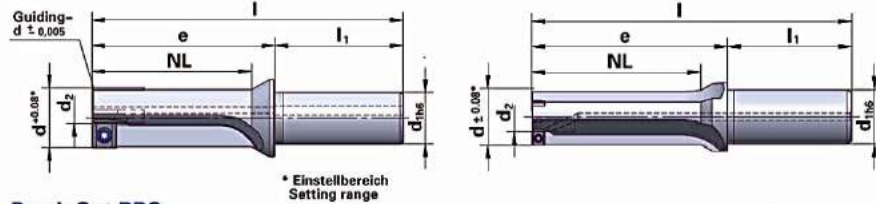


特点:

- 高切削率, 从d=26开始 3刀片切削
- 高精度镗削工艺, 公差可达(IT7-8)
- 简单快速的调节单元 (精度 $2 \mu\text{m}/^\circ$)
- 切宽可达4 mm
- 应用范围广

Advantages:

- High stock removal rates with 3 cutting edges from d=26
- Tight bore tolerances (IT7-8)
- Quick and precise setting of cutting diameter (inclination $2 \mu\text{m}/^\circ$)
- Cutting width up to 4 mm
- Usable on rigid machines



Preci-Cut RPC

d	d ₁	d ₂	e	l	l ₁	NL	货号 /			
							Ord.-No			
RPC03										
18	20	0,4	65	115	50	52	RPC03 1800	TX 35075	TX 215	09
19	20	0,2	65	115	50	53	RPC03 1900	TX 35075	TX 215	09
20	20	1,2	65	115	50	54	RPC03 2000	TX 35075	TX 215	09
21	20	2,2	65	115	50	54	RPC03 2100	TX 35075	TX 215	09
22	20	3,2	70	120	50	61	RPC03 2200	TX 35075	TX 215	09
23	20	4,2	70	120	50	61	RPC03 2300	TX 35075	TX 215	09
24	20	5,2	70	120	50	62	RPC03 2400	TX 35075	TX 215	09
25	20	6,2	70	120	50	62	RPC03 2500	TX 35075	TX 215	09
26	25	13,5	94	150	56	78	RPC03 2600	TX 25050	TX 208	06
27	25	14,5	94	150	56	81	RPC03 2700	TX 25050	TX 208	06
28	25	15,5	94	150	56	84	RPC03 2800	TX 25050	TX 208	06
29	25	16,5	104	160	56	87	RPC03 2900	TX 25050	TX 208	06
30	25	17,5	104	160	56	90	RPC03 3000	TX 25050	TX 208	06
31	25	18,5	104	160	56	93	RPC03 3100	TX 25050	TX 208	06
32	32	13,2	115	175	60	96	RPC03 3200	TX 35075	TX 215	09
33	32	14,2	115	175	60	99	RPC03 3300	TX 35075	TX 215	09
34	32	15,2	115	175	60	102	RPC03 3400	TX 35075	TX 215	09
35	32	16,2	115	175	60	105	RPC03 3500	TX 35075	TX 215	09
36	32	17,2	125	185	60	108	RPC03 3600	TX 35075	TX 215	09
37	32	18,2	125	185	60	111	RPC03 3700	TX 35075	TX 215	09
38	32	19,2	125	185	60	114	RPC03 3800	TX 35075	TX 215	09
39	32	20,2	130	190	60	117	RPC03 3900	TX 35075	TX 215	09
40	32	21,2	130	190	60	120	RPC03 4000	TX 35075	TX 215	09

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可根据客户要求尺寸订制 / Other dimensions and designs upon request

其它柄部结构 / Other shanks:

(请在下单时标明 / Please indicate with order)

Whistle Notch = DIN 1835 E Weldon = DIN 1835 B

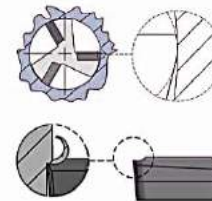


例 / Order example:

- 3 支 / pieces RPC03 4000
- 10 片 / pieces SCHX090304FRZK9

说明 / Specifications	货号 / Ord.-No	工件材质 / Material class											
		N	K	M	K	H	P	P	M	H	PM	HP	PMK
RPC可转位刀片 Indexable inserts for RPC													
切宽 / Cutting width < 0,5	09 SCHW 0903AC FRH...											K9	
切宽 / Cutting width < 0,5 槽口导向* / Guiding chamfers*	06 SCHW 0602AC FRZ...											K9	
	09 SCHW 0903AC FRZ...											K9	
切宽 < 2,5 bzw. 3,5 / PCD; Cutting width < 2,5 resp. 3,5	06 SCHW 060202 FRH...									D1			
	09 SCHW 090302 FRH...									D1			
	09 SCHW 090304 FRH...									D1			
单刃 / PCD; entire cutting width	06 SCHW 060202 FR5...									D1			
	09 SCHW 090302 FR5...									D1			
排屑槽 / ground chip breakers	06 SCHX 060204 FRH...	AK1	C1				K1	K9	P2	P5	P9		
	09 SCHX 090304 FRH...	AK1	C1				K1	K9	P2	P5	P9	S6	
槽口导向*; 排屑槽 / Guiding chamfers*; ground chip breakers	06 SCHX 060202 FRZ...						K1	K9	P2	P5	P9		
	06 SCHX 060204 FRZ...	AK1	C1				K1	K9	P2	P5	P9	S6	
	09 SCHX 090304 FRZ...	AK1	C1				K1	K9	P2	P5	P9	S6	
槽口导向*; 排屑槽; 短屑 / Guiding chamfers*; chip breakers* for short chips	06 SCHX 060204 FRZ7...											P9	
	09 SCHX 090304 FRZ7...											P9	

*** 基于刀片几何尺寸需要设计刀杆导向支撑 / Modification of tool guide pads (d<26) according insert geometry necessary
根据客户需求设计刀片 / Other indexable insert designs and grades upon request



* 圆角槽口导向刀片 (...Z...) 在加工中无震刀现象, 提高工件表面光洁度
3片刀片刀具切削更稳定 / Round ground guiding chamfers on the insert (...Z...) prevent chattering and burnish the bore surface -> well suitable for lean tools with min. 3 cutting edges

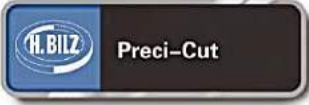
** 较低的切削刃与短排屑槽 (...7...) 在低速进给时产生碎屑, 更适合长屑的工件材料 / Low cutting edge and short chip breakers (...7...) generate short chips already at low feed rates -> well suitable for long chipping materials

切削参数推荐 / Cutting data recommendation:

	钢件 Steel	不锈钢 Stainless steel	铸铁 Cast iron	铝合金
硬度合金 / Carbide	e.g. C45E	e.g. X20Cr13	e.g. GJL, GJS	e.g. AISI10Mg
金属陶瓷 (C1)	Vc 60 - 150	40 - 90	60 - 160	100 - 500
PKD / PCD (D1)	Vc 80 - 200			180 - 600
进给 / Infeed				f (mm/rev)
18 - 25	f 0,06 - 0,15	0,06 - 0,15	0,08 - 0,15	0,1 - 0,2
26 - 40	f 0,15 - 0,4	0,12 - 0,3	0,15 - 0,5	0,2 - 0,5

进给 / Infeed	f (mm/rev)
-------------	------------

需中心冷却 / Sufficient coolant supply needed



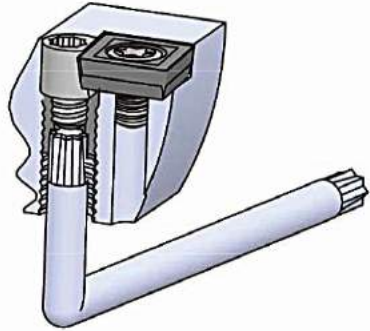
微调单元
Adjustment systems
(for individual tool solutions)

IT 7-8

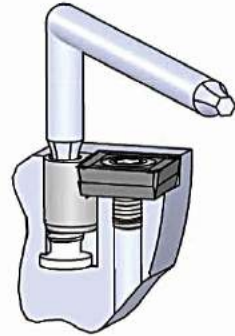
GJL / GJS ALU ST(EEL) NE

斜面调节 / Wedge adjustment

RPC



RPC-G



特点:

- 精加工一次完成
- 精度达IT7-8, 通过
- 调节可达IT6
- 调节尺寸0.15mm
- 简单快速调节, 2µm
- 刚性可靠
- RPC:从30mm
- RPC-G:从16mm
- 从2个方向调节锁销斜面

Advantages:

- Boring and finishing in one pass
- Short stepped tools can be realized
- Tight bore tolerances (IT7-8; with modified wedge also IT6)
- Diameter setting range 0.15 mm
- Quick and precise setting (inclination 2µm/°)
- High rigidity due to large area contact between insert and wedge
- Two lines:
 - RPC: adjustable from back side for D=30 and up
 - RPC-G: adjustable from insert side for D=16 and up
- Adjustment in two directions by combination with eccentric pin adjustment (e. g. for the use of low priced sinter-Inserts)

RPC: 小尺寸刀片调节 /

RPC: Smallest cutting diameter for radial adjustment

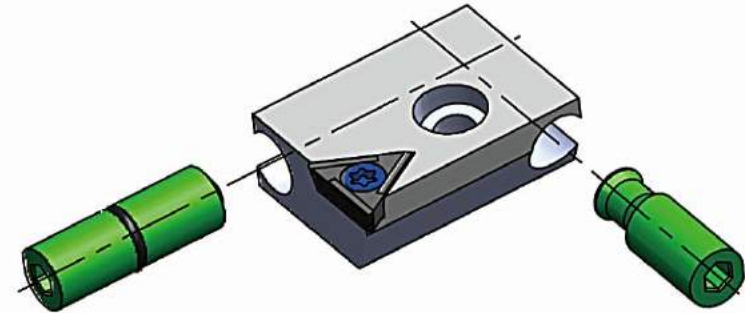
刀片规格 / Insert size	Z1	Z2	Z3
SC.0903..	30	31	46
SC.1204..	36	38	53

RPC-G: 小尺寸刀片调节 /

RPC-G: Smallest cutting diameter for radial adjustment

刀片规格 / Insert size	Z1	Z2	Z3
SC.0602..	16	22	29
SC.0903..	29	32	43
SC.1204..	36	43	59

可换刀夹微调单元 RPK / Cartridge system RPK



特点:

- 紧凑型设计从D=20mm开始
- 公差为IT7-8
- 尺寸调节范围0-3mm
- 单独设计结构不影响刀片位置
- 快速、精确调节结构
- 大切宽源于可靠的刚性
- 适用于各种刀片(A,C,M,S,T,X...)
- 保护刀体当刀片崩刃时

Advantages:

- Compact design for tools starting from D=20 mm
- Tight bore tolerances (IT7-8)
- Diameter setting range 0.3 mm
- Independent length and diameter setting without influence on the cutting edge angle
- Quick and precise setting
- Large cutting widths possible due to the rigid design
- Usable for many insert shapes (A, C, M, S, T, X...)
- Tool protection in case of insert breakage

RPK: 小尺寸刀片调节 /

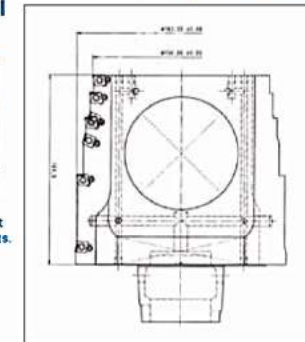
RPK: Smallest cutting diameter for radial adjustment

刀片规格 / Insert size	Z1	Z2	Z3
SC.0602..	20	26	32
SC.0903..	30	40	50
SC.1204..	40	47	60

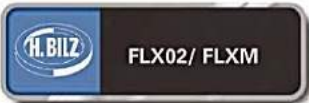
提示:我们能够提供不带刀片微调组合单元并达到H8精度的刀具, 如有需要请告知

Tip: We can offer tools for close tolerances like H8 also without insert adjustment by combination of high-precision inserts and insert seats. Please send us your request!

特殊刀具方案 / Special solution



特殊组合刀具带调节单元, 可更换PCD刀片 / Step-Preci-Cut with adjustable PCD-Inserts d=156x186



菲勒克斯深孔钻



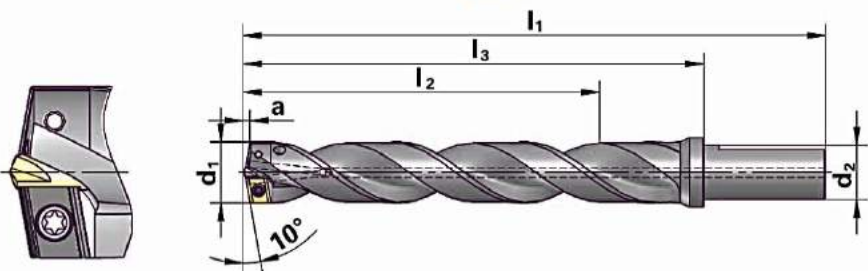
GJL / GJS ALU ST(EEL)

特点:

- 自定心中心钻与可转位刀片搭配
- 中心钻为HSS-E适合高切削强度
- 两片刀片保证高进给
- 接近H11的精度
- 刀片槽口导向保证孔的垂直度
- 中心钻为HSS与硬质合金两种

Advantages:

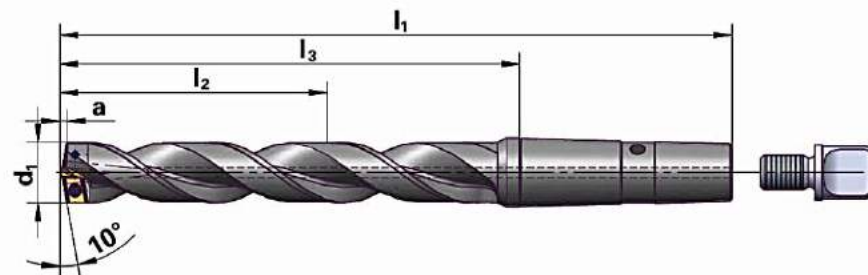
- Self-centering by means of core cutter and symmetrically positioned indexable inserts
- High toughness due to HSS-core cutter in the centre
- High feed rate with two inserts
- Close drilling tolerances (H11)
- Straight bores due to guiding chamfers on the inserts
- Universally usable with carbide and HSS-inserts
- Also usable in unstable conditions
- Machining of stacked bores possible



FLX02

d ₁ ±0,05	a	l ₁	l ₂	l ₃	d ₂ BZM	货号/ Ord.-No
						FLX02
18	2,2	200	120	150	20	FLX02 18 A
19	2,3	200	120	150	20	FLX02 19 A
20	2,4	200	120	150	20	FLX02 20 A
21	2,5	230	144	174	25	FLX02 21 A
22	2,6	230	144	174	25	FLX02 22 A
23	2,7	230	144	174	25	FLX02 23 A
24	2,8	230	144	174	25	FLX02 24 A
25	3,0	250	162	194	25	FLX02 25 A
26	3,1	250	162	194	25	FLX02 26 A
27	3,2	250	162	194	25	FLX02 27 A
28	3,3	280	186	224	25	FLX02 28 A
29	3,4	280	186	224	25	FLX02 29 A
30	3,4	280	186	224	25	FLX02 30 A
31	3,5	280	186	224	25	FLX02 31 A
32	3,8	325	222	265	32	FLX02 32 A
33	3,9	325	222	265	32	FLX02 33 A
34	4,0	325	222	265	32	FLX02 34 A
35	4,1	325	222	265	32	FLX02 35 A
36	4,2	325	222	265	32	FLX02 36 A
37	4,3	325	222	265	32	FLX02 37 A
38	4,5	340	234	280	32	FLX02 38 A
39	4,6	340	234	280	32	FLX02 39 A

可根据客户要求定制 / Other dimensions and designs upon request



FLXM

d ₁ ±0,05	a	l ₁	l ₂	l ₃	MK MT	货号/ Ord.-No	EAL
						FLXM	
18	2,2	191	110	136	2	FLXM 1800202	EAL 012
19	2,3	226	140	171	2	FLXM 1900202	EAL 012
20	2,4	226	140	171	2	FLXM 2000202	EAL 012
21	2,5	226	140	171	2	FLXM 2100202	EAL 012
22	2,6	226	140	171	2	FLXM 2200202	EAL 012
23	2,7	226	140	171	2	FLXM 2300202	EAL 012
24	2,8	272	160	201	3	FLXM 2400302	EAL 013
25	3,0	272	160	201	3	FLXM 2500302	EAL 013
26	3,1	272	160	201	3	FLXM 2600302	EAL 013
27	3,2	272	160	201	3	FLXM 2700302	EAL 013
28	3,3	302	190	231	3	FLXM 2800302	EAL 013
29	3,4	302	190	231	3	FLXM 2900302	EAL 013
30	3,4	302	190	231	3	FLXM 3000302	EAL 013
31	3,5	302	190	231	3	FLXM 3100302	EAL 013
32	3,8	348	210	258	4	FLXM 3200402	EAL 014
33	3,9	348	210	258	4	FLXM 3300402	EAL 014
34	4,0	348	210	258	4	FLXM 3400402	EAL 014
35	4,1	348	210	258	4	FLXM 3500402	EAL 014
36	4,2	383	240	293	4	FLXM 3600402	EAL 014
37	4,3	383	240	293	4	FLXM 3700402	EAL 014
38	4,5	383	240	293	4	FLXM 3800402	EAL 014
39	4,6	383	240	293	4	FLXM 3900402	EAL 014

* 需单独订购 / order separately

刀片、配件 S.P. 14-15 / inserts, spare parts and accessories s. p. 14-15

切削参数推荐 / Cutting data recommendation:

	Vc	铜件 Low alloy Steel	合金钢 High alloy steel	铸铁 Cast iron	铝合金 铝合金
		e.g. C45E	e.g. X20Cr13	e.g. GJL, GJS	e.g. AlSi10Mg
硬质合金 / Carbide	Vc	60 - 130	50 - 120	80 - 120	100 - 500
HSSE (S6)	Vc	25 - 40	20-35		
∅ d					
18 - 21	f	0,15 - 0,25	0,10 - 0,20	0,20 - 0,30	0,20 - 0,35
22 - 28	f	0,18 - 0,30	0,15 - 0,25	0,20 - 0,40	0,20 - 0,40
> 29	f	0,20 - 0,35	0,18 - 0,30	0,25 - 0,50	0,25 - 0,50

线速度 / Cutting speed
Vc (m/min)
进给 / Infeed
f (mm/rev)

需中心冷却 / Sufficient coolant supply needed



Flexispeed FLX02/FLXM /
菲勒克斯深孔钻

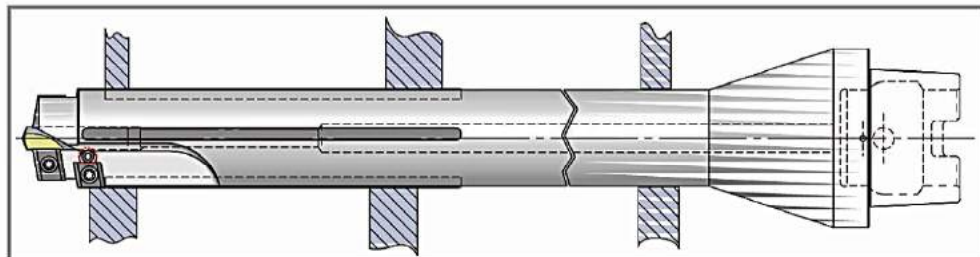
刀片、配件
Inserts, Spare Parts and Accessories

mm ∅	FLX02 6 x D, zyl./ cyl.	FLXM 6 x D, MK / MT	中心钻* / Core Cutter HSSE (N = TiN)	刀片* / Insert	材质 / Material class (s. p. 22)						锁紧螺钉 Fixing screw for core cutter	刀片螺钉	扳手
					N	K	K	P	P	PKS			
					材质 / Grade								
18	FLX02 18 A	FLXM 1800202	KEN01 052 (N)	XCEX 070204 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 25050	TX 208
19	FLX02 19 A	FLXM 1900202	KEN01 052 (N)	XCEX 075204 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 25050	TX 208
20	FLX02 20 A	FLXM 2000202	KEN01 052 (N)	XCEX 080204 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 25050	TX 208
21	FLX02 21 A	FLXM 2100202	KEN01 052 (N)	XCEX 085304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 35075	TX 215
22	FLX02 22 A	FLXM 2200202	KEN01 052 (N)	XCEX 090304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 35075	TX 215
23	FLX02 23 A	FLXM 2300202	KEN01 052 (N)	XCEX 095304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 35075	TX 215
24	FLX02 24 A	FLXM 2400302	KEN01 052 (N)	XCEX 100304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010406	TX 35075	TX 215
25	FLX02 25 A	FLXM 2500302	KEN01 062 (N)	XCEX 100304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
26	FLX02 26 A	FLXM 2600302	KEN01 062 (N)	XCEX 105304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
27	FLX02 27 A	FLXM 2700302	KEN01 062 (N)	XCEX 110304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
28	FLX02 28 A	FLXM 2800302	KEN01 062 (N)	XCEX 115304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
29	FLX02 29 A	FLXM 2900302	KEN01 062 (N)	XCEX 120304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
30	FLX02 30 A	FLXM 3000302	KEN01 062 (N)	XCEX 125304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
31	FLX02 31 A	FLXM 3100302	KEN01 062 (N)	XCEX 130304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010508	TX 35075	TX 215
32	FLX02 32 A	FLXM 3200402	KEN01 082 (N)	XCEX 125304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010610	TX 35075	TX 215
33	FLX02 33 A	FLXM 3300402	KEN01 082 (N)	XCEX 130304 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010610	TX 35075	TX 215
34	FLX02 34 A	FLXM 3400402	KEN01 082 (N)	XCEX 135404 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010610	TX 45115	TX 215
35	FLX02 35 A	FLXM 3500402	KEN01 082 (N)	XCEX 140404 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010610	TX 45115	TX 215
36	FLX02 36 A	FLXM 3600402	KEN01 082 (N)	XCEX 145404 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010612	TX 45115	TX 215
37	FLX02 37 A	FLXM 3700402	KEN01 082 (N)	XCEX 150404 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010612	TX 45115	TX 215
38	FLX02 38 A	FLXM 3800402	KEN01 102 (N)	XCEX 145404 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010612	TX 45115	TX 215
39	FLX02 39 A	FLXM 3900402	KEN01 102 (N)	XCEX 150404 FRZ ...	...AK1	... K1	...K9	...P2	...P7	...S6	KLS 010612	TX 45115	TX 215

*需单独订购 / Order separately
可根据客户要求尺寸订制 /
Other dimensions (also larger diameters) upon request

硬质合金中心钻 / Carbide core cutters on request
可转位刀片可根据客户需求设计 /
Inserts with chip splitter and other designs on request

精加工刀具 /
Flexispeed in special design with guide pads and adjustable inserts



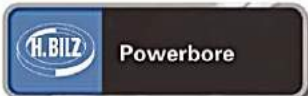
材质 / Grades

材质 Grade	DIN-ISO 513	硬质合金 Cutting material	材质 / Material class			
			钢件 Steel P	铸铁 Cast iron K	合金钢 Nonferrous metal N	有色金属 Special alloys and Titanium S
AK1	HW - N20	硬质合金 / Carbide		o	+	o
K1	HF - K20	硬质合金 / Carbide		+		
K9	HC - K10	硬质合金 / Carbide TiAlN		+		
P2	HF - P30	硬质合金 / Carbide	+			
P7	HC - P40	硬质合金 / Carbide TiN	+	o		
S6		HSSE-TiN	+	o		+

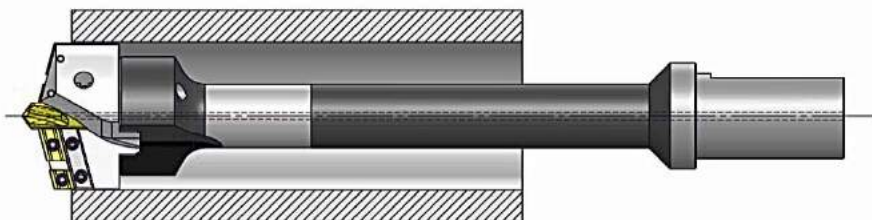
例 / Order example:

- 2支/pieces FLXM 2700302
- 6支/pieces KEN01 062N
- 10片/pieces XCEX 110304 FRZP7
- 2个/pieces EAL 013
- 1个/piece TX 215
- 10支/pieces TX 35075
- 5个/pieces KLS 010508

+ = 主要推荐 / Main application
o = 一般可选 / Minor application



炮爆钻头系列 KSB/KBH
Drilling system KSB/KBH



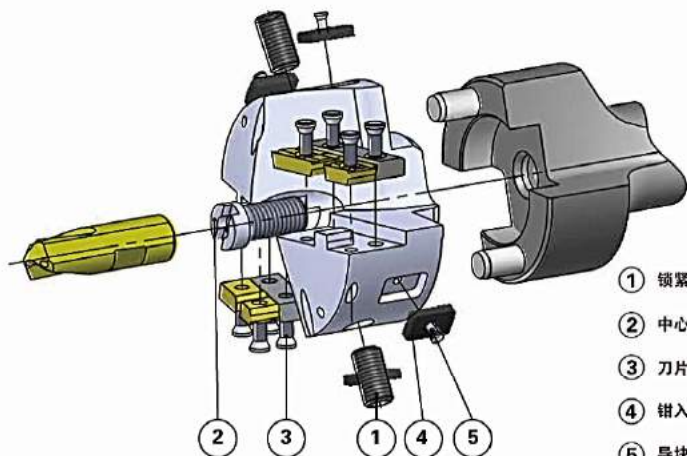
特点:

- 刀片结构优势大切削中需要的机床功率小
- 刀片结构满足高进给率
- 刀柄结构更加可靠
- 达到精度H11
- 钳入式导块满足断续加工
- 各种材质的刀片
- 表现良好
- 应用范围广

Advantages:

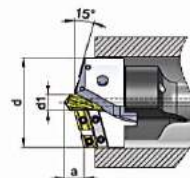
- Very positive rake angle for low machine power requirement
- High feed rate due to maximum overlap of inserts
- High performance by rigid and undivided holder
- Close drilling tolerances (H11)
- Straight bores due to guiding chamfers on the external inserts
- Guide plates for inclined bore outlets and cut interruptions (KSB03)
- Universally usable with carbide and HSS-inserts
- Also usable in unstable conditions
- Machining of staked bores possible

炮爆钻头 KSB03 / Cutter head KSB03

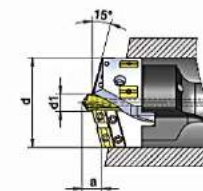


- ① 锁紧螺钉 / Fixing screw
- ② 中心螺钉 / Cutter head screw
- ③ 刀片螺钉 / Insert screw
- ④ 钳入式导块 / Guide plate
- ⑤ 导块压紧螺钉 / Guide plate screw

钻头模块 / Cutter heads



KSB01 不带支撑导向块 / without carbide guide plates



KSB01 带支撑导向块 / with carbide guide plates

配件 KSB03 / Spare parts for KSB03

d	d ₁	a*	Anzahl WSP / No. of inserts	Größe BZS	货号* / Ord.-No
KSB01					
39	11	10	3	08	KSB01 039
40	11	10	3	08	KSB01 040
45	11	10	3	08	KSB01 045
48	11	11	4	08	KSB01 048
50	11	11	4	09	KSB01 050
57	11	12	4	09	KSB01 057
60	13	14	4	1	KSB01 060
67	13	15	4	1	KSB01 067
70	13	16	4	1	KSB01 070
77	13	17	4	1	KSB01 077
80	13	17	5	2	KSB01 080
87	13	18	5	2	KSB01 087
90	13	18	5	2	KSB01 090
97	13	19	6	2	KSB01 097
100	13	20	6	3	KSB01 107
107	13	21	6	3	KSB01 107
110	13	21	6	3	KSB01 110
117	13	22	6	3	KSB01 117
120	16	23	6	4	KSB01 120
127	16	24	8	4	KSB01 127
130	16	24	8	4	KSB01 130
137	16	25	8	4	KSB01 137
140	16	26	8	4	KSB01 140
147	16	27	10	4	KSB01 147
150	16	27	10	4	KSB01 150
157	16	28	10	4	KSB01 157
160	16	28	10	4	KSB01 160

货号* / Ord.-No	Stk. / Pcs.	④	⑤
		Fü hrungsplatten / guide plates	
KSB03			
KSB03 039	4	Z7S 0400	TX 25050S
KSB03 040	4	Z7S 0400	TX 25050S
KSB03 045	4	Z7S 0400	TX 25050S
KSB03 048	4	Z7S 0400	TX 25050S
KSB03 050	4	Z7S 0500	TX 25050S
KSB03 057	4	Z7S 0500	TX 25050S
KSB03 060	4	Z7S 0600	TX 35095S
KSB03 067	4	Z7S 0600	TX 35095S
KSB03 070	4	Z7S 0700	TX 35095S
KSB03 077	4	Z7S 0700	TX 35095S
KSB03 080	6	Z7S 0800	TX 35095S
KSB03 087	6	Z7S 0800	TX 35095S
KSB03 090	6	Z7S 0800	TX 35095S
KSB03 097	6	Z7S 0900	TX 35095S
KSB03 107	6	Z7S 0900	TX 35095S
KSB03 107	6	Z7S 0900	TX 35095S
KSB03 110	6	Z7S 1200	TX 35095S
KSB03 117	6	Z7S 1200	TX 35095S
KSB03 120	6	Z7S 1200	TX 35095S
KSB03 127	6	Z7S 1200	TX 35095S
KSB03 130	6	Z7S 1200	TX 35095S
KSB03 137	6	Z7S 1400	TX 35095S
KSB03 140	6	Z7S 1400	TX 35095S
KSB03 147	6	Z7S 1400	TX 35095S
KSB03 150	6	Z7S 1400	TX 35095S
KSB03 157	6	Z7S 1400	TX 35095S
KSB03 160	6	Z7S 1400	TX 35095S

* 用ZB02 / When using ZB02...
其它尺寸根据双方协议提供 / Intermediate dimensions available on short term

根据客户需求定制 / Other dimensions and designs upon request
刀片刀杆备件请参阅 s. S. 18-19 / Inserts, holder and spare parts s. p. 18-19

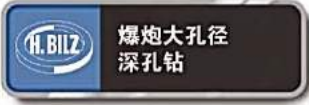
切削参数推荐 / Cutting data recommendation:

Ø	Vc	钢件 Low alloy Steel		合金钢 High alloy steel		铸铁 Cast iron	铝合金 铝合
		e.g. C45E		e.g. 42CrMo4		e.g. GJL, GJS	e.g. AISI10Mg
		HM (P)	HSSE (S6)	HM (P)	HSSE (S6)	HM (P)	HM (P)
39 - 58	f	0,20 - 0,25	0,20 - 0,30	0,20 - 0,25	0,20 - 0,30	0,20 - 0,35	0,20 - 0,35
59 - 99	f	0,20 - 0,30	0,25 - 0,40	0,20 - 0,30	0,25 - 0,40	0,25 - 0,40	0,20 - 0,40
>= 100	f	0,25 - 0,35	0,30 - 0,60	0,25 - 0,35	0,30 - 0,50	0,30 - 0,50	0,25 - 0,50

线速度 / Cutting speed
Vc (m/min)

进给 / Infeed
f (mm/rev)

需中心冷却 / Sufficient coolant supply needed



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刀片 / Inserts		刀柄 / Holder																										
模化刀头 / Cutter Head	中心钻 / Centre Drill	数量 / Pcs	刀片 / Very positive rake angle	材质 / Grade (s. p. 22)			用于低速进给刀片 / Chip breakers for short chips already at low feed rates																					
								MK DIN 228		BT50/SK50		ABS (刀柄)		附图例 / Cylinder shank D=40														
								尺寸 / Size	BT	货号 / Ord.-No	MT	BT	货号 / Ord.-No	ABS	BT	货号 / Ord.-No												
38,0 - 42,9	ZB021135N	2	XBHX 060304 FR3... XBHX 110304 FR3...	P7	P9	S6	XBHX 060304 FR7 P9 XBHX 110304 FR7 P9	08	105	KBH0 0804 A	4	EAL014	105	KBH2 0850 A	50	205	KBH4 0840 A											
43,0 - 45,9	ZB021135N	1	XBHX 060304 FR3... XBHX 080304 FR3... XBHX 110304 FR3...	P7	P9	S6	XBHX 060304 FR7 P9 XBHX 080304 FR7 P9 XBHX 110304 FR7 P9											205	KBH2 0850 B	300	KBH4 0840 B							
46,0 - 47,4	ZB021135N	2	XBHX 080304 FR3... XBHX 110304 FR3...	P7	P9	S6	XBHX 080304 FR7 P9 XBHX 110304 FR7 P9															130	KBH0 0904 A KBH0 0904 B	4	EAL014	130	KBH2 0963 A KBH2 0963 B	63	250	KBH4 0940 A KBH4 0940 B
47,5 - 48,9	ZB021135N	1	XBHX 060304 FR3... XBHX 080304 FR3... XBHX 110304 FR3...	P7	P9	S6	XBHX 060304 FR7 P9 XBHX 080304 FR7 P9 XBHX 110304 FR7 P9	250	KBH0 104 A	4	EAL014	245	KBH1 150 B	245	KBH2 163 B	63	245														KBH4 1040 B
49,0 - 52,9	ZB021135N	2	XBHX 060304 FR3... XBHX 080304 FR3... XBHX 110304 FR3...	P7	P9	S6	XBHX 060304 FR7 P9 XBHX 080304 FR7 P9 XBHX 110304 FR7 P9											365	KBH0 104 C	4	EAL014											365	KBH1 150 C	365	KBH2 163 C	480	KBH4 1040 C
53,0 - 57,9	ZB021135N	2	XBHX 080304 FR3... XBHX 110304 FR3...	P7	P9	S6	XBHX 080304 FR7 P9 XBHX 110304 FR7 P9															120	KBH0 104 D	4	EAL014	120	KBH2 163 A	120	KBH4 1040 A
58,0 - 59,9	ZB021346N	1	XBHX 090404 FR3... XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 100404 FR7 P9 XBHX 150404 FR7 P9	245	KBH0 104 B	4	EAL014	245	KBH1 150 B	245	KBH2 163 B	63	245													KBH4 1040 B
60,0 - 65,9	ZB021346N	2	XBHX 090404 FR3... XBHX 120404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 120404 FR7 P9											365	KBH0 104 C	4	EAL014										365	KBH1 150 C	365	KBH2 163 C	480	KBH4 1040 C
66,0 - 69,5	ZB021346N	2	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9															185	KBH0 205 A	5	EAL015	185	KBH1 250 B	185	KBH4 1040 D
69,6 - 79,9	ZB021346N	2	XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 150404 FR7 P9	335	KBH0 205 B	5	EAL015	335	KBH1 250 B	335	KBH4 1040 D													
80,0 - 85,5	ZB021356N	3	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9									475	KBH0 205 C	5	EAL015	475	KBH1 250 C									475	KBH4 1040 D
85,6 - 90,5	ZB021356N	3	XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 150404 FR7 P9															640	KBH0 205 D	5	EAL015	640	KBH1 250 D	640	KBH4 1040 D
90,6 - 92,5	ZB021356N	2	XBHX 100404 FR3... XBHX 120404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 120404 FR7 P9 XBHX 150404 FR7 P9	210	KBH0 305 A	5	EAL015	210	KBH1 350 A	210	KBH4 1040 D													
92,6 - 96,5	ZB021356N	4	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9									365	KBH0 305 B	5	EAL015	365	KBH1 350 B									365	KBH4 1040 D
96,6 - 99,9	ZB021356N	4	XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 150404 FR7 P9															510	KBH0 305 C KBH0 305 D	5	EAL015	510	KBH1 350 C	510	KBH4 1040 D
100,0 - 106,5	ZB021356N	2	XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 150404 FR7 P9	700	KBH0 305 C KBH0 305 D	5	EAL015	700	KBH1 350 C KBH1 350 D	700	KBH4 1040 D													
106,6 - 119,9	ZB021356N	2	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9									185	KBH0 405 A	5	EAL015	185	KBH1 450 B									185	KBH4 1040 D
120,0 - 126,5	ZB021857N	2	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9															335	KBH0 405 B	5	EAL015	335	KBH1 450 B	335	KBH4 1040 D
126,6 - 129,5	ZB021857N	6	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9	485	KBH0 405 C	5	EAL015	485	KBH1 450 C	485	KBH4 1040 D													
129,6 - 145,5	ZB021857N	6	XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 150404 FR7 P9									700	KBH0 405 D	5	EAL015	700	KBH1 450 D									700	KBH4 1040 D
145,6 - 152,9	ZB021857N	8	XBHX 090404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 090404 FR7 P9 XBHX 150404 FR7 P9															153,0 - 160	ZB021857N	8	XBHX 100404 FR3... XBHX 150404 FR3...	P7	P9	S6	XBHX 100404 FR7 P9 XBHX 150404 FR7 P9

例 / Order example:
 1PC Drilling head KSB01 050 KSB01/50
 5 PCS可转位刀片/entre Drill ZBO 021135NI
 Indexable Inserts:
 20 pieces XBHX080304FR3P7
 20 pieces XBHX110304FR3P7
 20 pieces XBHX060304FR3P7
 2 pieces 刀柄 / Holder for BT 130 KBH2 0963 A

配件 / Spare parts				
刀片 / For cutter head	1	2	3	4
KSB	模化螺钉 / Fluting screw	中心孔螺钉 / Cutter head screw	刀片螺钉 / Centre screw	螺母 / Screwdriver
38,0 - 67,9	KL501 0612	AN501 0820	TX 2506.0	TX 208
68,0 - 119,9	KL501 0816	AN501 1025	TX 3509.0	TX 215
120,0 - 160,0	KL501 0816	AN501 1225	TX 3509.0	TX 215

根据客户需求定制 / Other dimensions and designs upon request * 尺寸为58-59.9的刀头需根据客户实际情况减小刀柄尺寸, 当订货时加以说明
 Diameter of holders must be reduced for cutter head from diameter 58 to 59.9.
 Please indicate when ordering!

通过冷却环实现中心冷却 / Coolant supply through shank or ring