Double Column type CNC Vertical Turning Center

VTB/VTC Series

VTB(C)-2530E/3040E/4050E/5060E/100120E

HANKOOK

VTB/VTC -2530E/3040E/4050E/5060E/100120E

Double Column type CNC Vertical Turning Center with Cross-rail Elevating

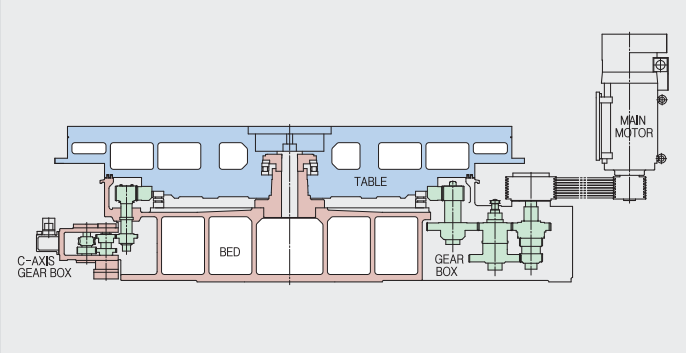
■ High Productivity
- Maximum 12000mm turning capacity
- 400 tons load capable table
- Elevating cross rail of 1500~4500mm stroke
- Fully controlled C-axis and rotary spindle

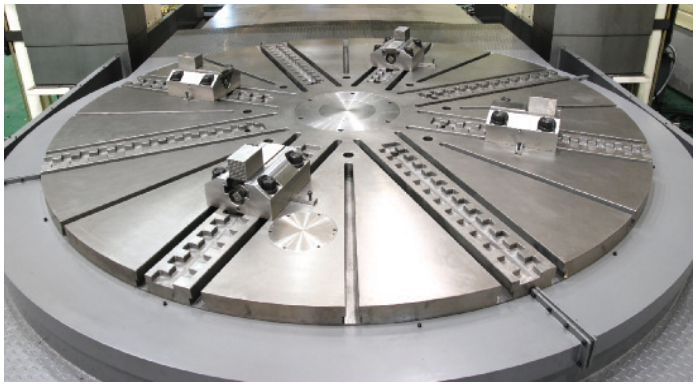
■ High Reliability
- Heavy duty guide ways of box type
- Massive one-piece cast iron bed, column and cross rail
- Induction-hardened and precise-ground guide ways
- Extra large 300 and 500mm square spheroidal-graphite-iron ram
- Hydrostatic table bearing(option)

■ High Accuracy
- Qualified precision bearings & ball screws
- Fluoroplastic-bonded & hand-scraped guide ways
- Full automatic lubrication to all critical areas

*Super large CNC vertical **VTB/VTC** series presents a new standard of double column type vertical turning center.*

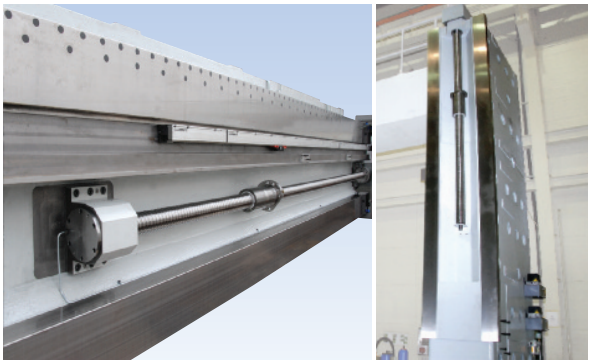
Bed/Table





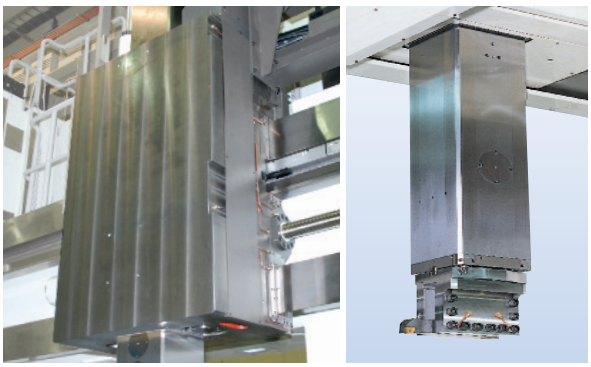
- One-piece casting bed of box shape and rib structure safely support the load of large work-piece to the maximum 400 tons.
- Table is made of high quality casting, and the variously shaped work-piece can be clamped with 8T-slots and 8 independent manual slide jaws on the table.
- Table is supported on the high precision thrust cylindrical roller bearing and tapered roller bearing, and it fully stands heavy-duty cutting load with rigidity.
- Gear driven table by a large diameter helical gear connected with powerful main motor and v-belts, and the gears are changed at two-step(high & low) by hydraulic cylinder.
- Shafts and gears are made by special steel, and heat-treated, precise-ground, so those help the table in stable rotation even at high torque.
- On VTC model, C-axis drive unit is installed on bed, and it can index to the minimum 0.001degree, so various milling jobs are possible with this unit.

Cross-rail/Column

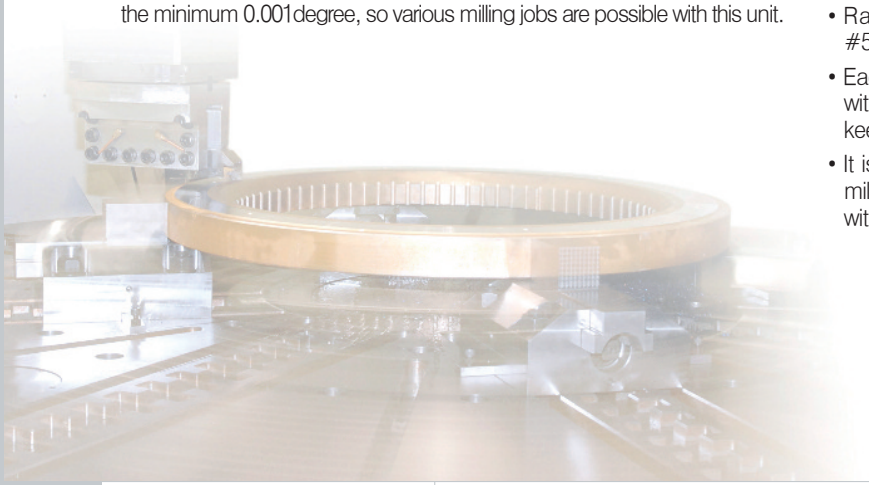


- Cross-rail is accurate-sliding on the column guide-way by AC servo motor and high precise ball screw and strong-fixed by hydraulic clamping device after positioning. It travels to the maximum 4500mm.
- Column has thick wall and rib structure of box-shape, so can be fully rigid to sustain torsion or bending generated during heavy-duty cutting.

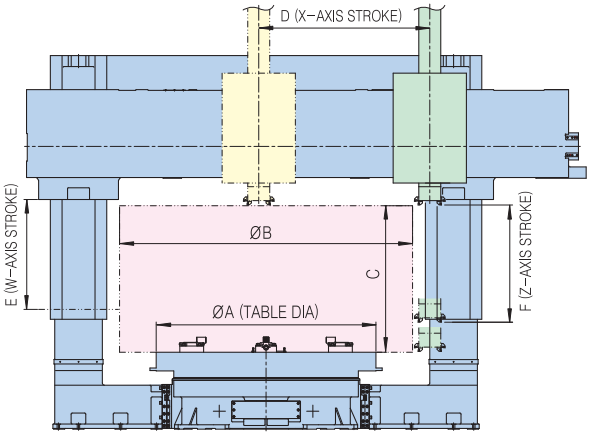
Saddle/Ram

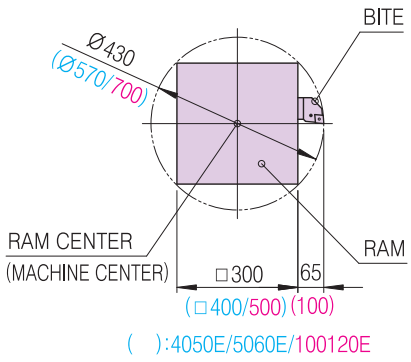


- The saddle enclosing the ram is one-piece casting to keep the high rigidity.
- The ram of special cast iron is heat-treated and precise-ground. 300 and 500mm sized square ram can vertically travel to the 1600 and 3000mm maximum.
- Ram head can equip tool holders of ISO 7/24 taper #50(BT50) standard and MAS P50T-I pull stud.
- Each guide-way for feeding axis is lubricated and attached with Turcite for reduced wear and friction-resistance and to keep it in the most optimum condition.
- It is possible to face-mill, end-mill, drill or do other multiple milling jobs on VTC, so it increases productivity accompanied with intensive work progress and effective process.



Machining Range





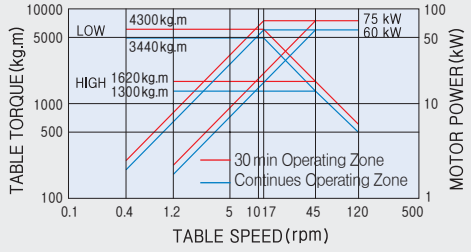
Minimum Boring

Unit : mm

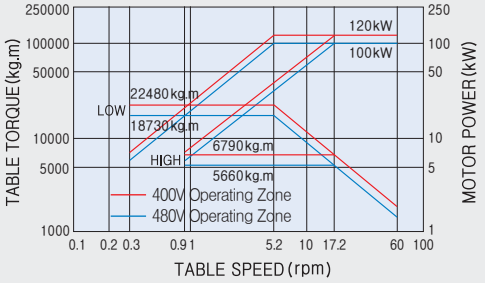
	VTB(C)-2530E	VTB(C)-3040E	VTB(C)-4050E	VTB(C)-5060E	VTB(C)-100/120E
A	2500	3000	4000	5000	10000
B	3000	4000	5000	6000	12000
C	2000/2500	2000/2500	2500/3000	2500/3000	6000
D	1835	2335	3745	4245	6915
E	1500/2000	1500/2000	2000/2500	2000/2500	4500
F	1600	1600	2000	2000	3000

Table Torque-Power Diagram

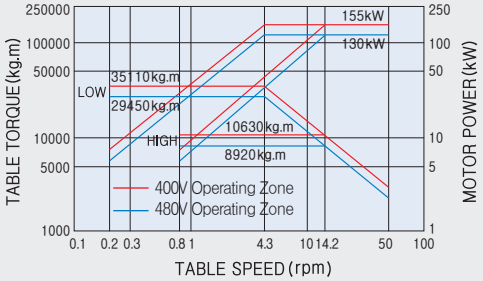
● VTB-2530E/3040E
(Max.120rpm, Motor.60/75kW)



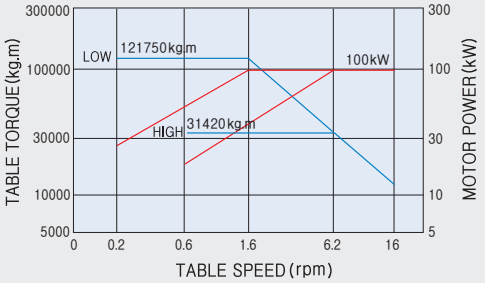
● VTB-4050E
(Max.60rpm, 100kW/400V, 120kW/480V)



● VTB-5060E
(Max.50rpm, 130kW/400V, 155kW/480V)



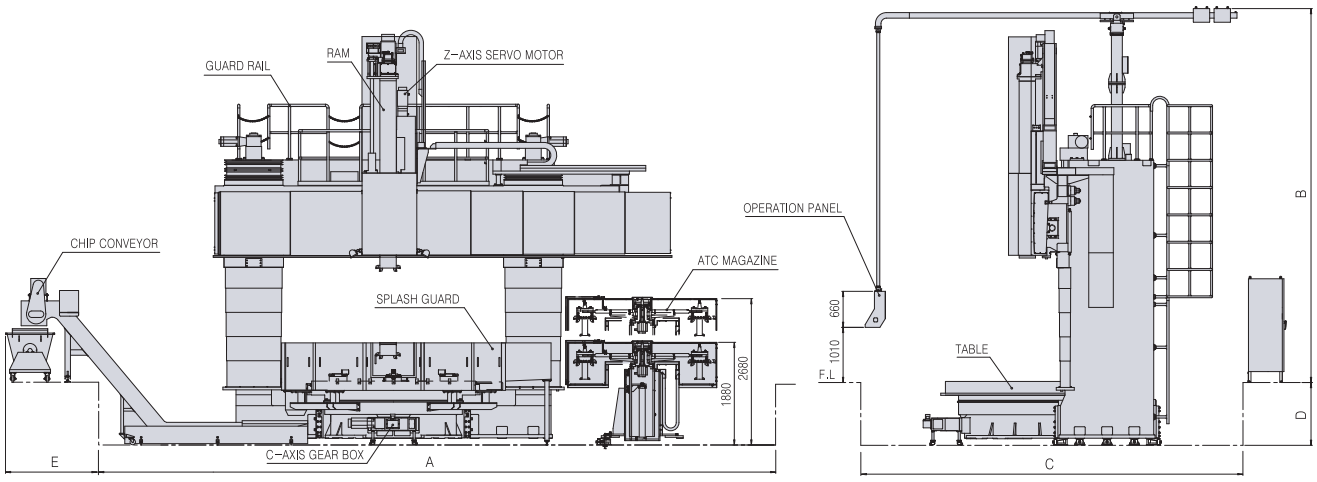
● VTB-100/120E
(Max.16rpm, Motor.100kW×2EA)



Machine Specifications

Items		Unit	VTB[VTC]	
			VTB(C)-2530E	VTB(C)-3040E
Capacity	Maximum swing	mm(inch)	3000 (118.1)	4000 (157.5)
	Maximum turning diameter	mm(inch)	3000 (118.1)	4000 (157.5)
	Maximum turning height	mm(inch)	2000/2500 (78.7/98.4)	2000/2500 (78.7/98.4)
	Maximum load on table	kg(lbs)	20,000 (44,100)	30,000 (66,140)
Table	Table diameter	mm(inch)	2500 (98.5)	3000 (118.1)
	Table speed	rpm	1~120	1~100
	Number of table speed range	step	Automatic 2	
C-axis	Cutting feed	deg/min	[0~180]	
	Maximum speed	rpm	[0.5]	
Ram Head	Tool size	mm(inch)	□50 (□2)	
	Spindle taper	–	ISO 7/24 No.50	
	Section dimension of square ram	mm(inch)	300×300 (11.8×11.8)	
	Mill spindle speed	rpm	[15-1500]	
Travel & Feedrate	X-axis travel(Saddle cross)	mm(inch)	1835 (72.2)	2335 (92.0)
	Z-axis travel(Ram vertical)	mm(inch)	1600 (63.0)	
	W-axis travel(Cross rail vertical)	mm(inch)	1500/2000 (59.1/78.7)	
	X/Z-axis cutting feed-rate	mm/min	Max. 8000	
	X/Z-axis rapid traverse	mm/min(ipm)	8000 (315)	
	W-axis rapid traverse	mm/min(ipm)	500 (19.7)	
ATC	Type of tool holder	–	MAS BT50	
	Number of tool	set	VTB : 12 tools, VTC : 24 tools	
	Maximum tool weight	kg(lbs)	90 (198)	
	Type of pull stud	–	P50T-I [DIN.69872]	
Motors	Table motor	kW(Hp)	AC 60/75 (80/100)	
	Mill spindle motor	kW(Hp)	[AC 22/26 (25/30)]	
	X-axis servo motor	kW(Hp)	AC 9 (12)	
	Z-axis servo motor	kW(Hp)	AC 9 (12)	
	C-axis servo motor	kW(Hp)	[AC 9 (12)]	
	W-axis servo motor	kW(Hp)	AC 14 (19)	
Machine Weight		kg(lbs)	90,000 (198,400)	95,000 (209,500)
CNC Controller		–	FANUC 31i series	

External Dimensions



Unit : mm

Model	A	B	C	D	E
VTB-2530E (W stroke 1500/2000)	11770	6850/7350	8250	1150	1400
VTB-3040E (W stroke 1500/2000)	13100	6850/7350	8250	1150	1700
VTB-4050E (W stroke 2000/2500)	15600	8540/9040	10500	1500	2000
VTB-5060E (W stroke 2000/2500)	16500	8540/9040	10500	1500	2000
VTB-100120E	20110	15600	15000	1590	–

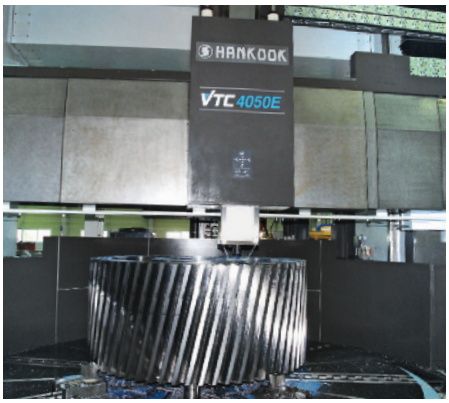
VTB[VTC]		
VTB(C)-4050E	**VTB(C)-5060E**	**VTB(C)-100/120E**
5000 (196.9)	6000 (236.2)	Ø12,000 (472)
5000 (196.9)	6000 (236.2)	Ø12,000 (472)
2500/3000 (98.4/118.1)	2500/3000 (98.4/118.1)	6000 (236.2)
50,000 (110,230)	60,000 (132,280), 100 ton (Option)	400,000 (882,000)
4000 (157.5)	5000 (196.9)	10,000 (394)
1~60	1~50	1~16
Automatic 2		Automatic 2
[0~120]		[1~40]
[0.333]		[0.111]
□50 (□2)		□50 (□2)
ISO 7/24 No.50		ISO 7/24 No.60
400×400 (15.7×15.7)		500×500 (19.8×19.8)
[15~1500]		[15~1500]
3745 (147.4)	4245 (167.1)	6915 (272)
2000 (78.7)		3000 (118)
2000/2500 (78.7/98.4)		4500 (177)
Max. 6000		Max. 6000
6000 (236)		6000 (236)
500 (19.7)		500 (19.7)
MAS BT50		–
VTB : 12 tools, VTC : 24 tools		–
110 (243)		–
P50T-I [DIN.69872]		–
AC 100/120 (135/160)	AC 130/155 (175/200)	AC 100 (133)×2EA
[AC 37/45 (50/60)]		[AC 60/75 (80/100)]
AC 14 (19)		AC 16 (20)
AC 14 (19)		AC 14 (19)
[AC 16 (21)]		–
AC 14 (19)		AC 14(19)×2EA
220,000 (485,000)	250,000 (551,000)	600,000 (1,323,000)
FANUC 31i series		

Standard Accessories

- CNC controller, FANUC 31i series
- Pendant arm type operation panel
- 4-jaw manual chuck
- Automatic tool changer (VTB : Turning 12, VTC : Turning 12 + Milling 12)
- Lubrication oil cooler
- C-axis scale (Only for VTC)
- Hydraulic power unit
- Automatic lubrication system for guides
- Coolant system
- Through spindle coolant
- Slideway protect steel cover (X/W-axis)
- Work light
- Patrol lamp (Red, Yellow, Green)
- NC power off
- Chip tank
- Splash guard
- Levelling block
- Foundation bolt & nut
- Tool box with maintenance tools

Optional Accessories

- Chip conveyor & bucket
- High pressure coolant system
- Scale feedback (X/Z/W-axis)
- Tool setter
- Work probe
- Angle head
- Oil skimmer
- Air-conditioner for electrical cabinet
- High cooler for operation panel
- OP station elevator
- Transformer
- Tool holders



CNC System Specifications (FANUC 31i series)

Standard Function

Controlled Axis	
Controlled axes	5 axes(X, Z, C, W1, W2)
Simultaneously controlled axes	2 axes
Increment system	0.001mm(0.0001″)
HRV2 control	
Flexible feed gear	Optional DMR
Interlock	All/each axis, each direction, block start, cutting block start
Machine lock	All/each axis
Emergency stop	
Over travel	
Stored stroke check 1	
Mirror image	All/each axis
Follow-up	
Servo off/mechanical handle	
Chamfering on/off	
Inch / Metric conversion	

Operation	
Automatic operation	
MDI operation	
DNC operation with memory card	CF Card
Program number search	
Sequence number search	
Wrong operation prevention	
Buffer register	
Dry run	
Single block	
Manual continuous feed(jog)	
Manual reference position return	
Reference position setting without DOG	
Reference position return speed set	
Reference position shift	
Incremental feed	x1, x10, x100
Program restart	
Manual handle feed 1-unit	1-unit
Handle interruption	

Auxiliary/Spindle Functions	
Auxiliary function	M8 digit
Auxiliary function lock	
High-speed M/S/T/B interface	
Spindle speed function	S5 digit, binary output
Rigid tap	

Interpolation Functions	
Nano interpolation	
Positioning	G00
Exact stop mode	G61
Tapping mode	G63
Cutting mode	G64
Exact stop	G09
Linear interpolation	
Circural interpolation	
Dwell	
Thread cutting, synchronous cutting	
Multi threading	
Continuous threading	
Skip	G31
Torque limit skip	
Reference position return	G28
Reference position return check	G27
2nd reference position return	G30

Feed Functions	
Rapid traverse rate	MAX 999.999 m/min(1um)
Rapid traverse override	F0, 50, 100%(1step)
Feed per minute	G98 mm/min
Feed per revolution	G99 mm/rev
Tangential speed constant control	
Cutting feedrate clamp	
Automatic acceleration/deceleration	Rapid traverse: linear Cutting feed: exponential, linear
Rapid travelse bell-shaped acceleration/deceleration	
Feedrate override	0-254%
Jog override	0-655.34%
Override cancel	
Manual per revolution feed	
Linear acc/dec after cutting feed interpolation	

Program Input	
Tape code	EIA / ISO
Label skip	
Control in/out	
Optional block skip	1
Max. programmable dimension	±9 digit
Program file name	32 characters
Sequence number	N8 digit
Absolute/incremental programming	Combined use in the same block
Decimal point programming/pocket calculator type decimal point programming	
Input unit 10 time multiply	
Diameter/radius programming	
Plane slection	G17, G18, G19
Automatic coordinate system setting	
Manual absolute on and off	
G code system	C
Programmable data input	G10
Programmable parameter input	
Sub program call	10 folds nested
Canned cycle	
Circural interpolation by R programming	R, I, J, K 12digit
Coordinate system shift	
Direct input of coordinate system shift	
Chamfering/corner R	

Tool Function/Tool Compensation	
Tool function	
Tool offset pairs	32-pairs
Tool offset	
Tool offset value counter input	
Direct input of tool offset value measure	
Tool geometry/wear Compensation	

Accuracy Compensasion Function
Backlash compensation
Backlash compensation for each rapid traverse and cutting feed
Stored pitch error compensation

Editing Operation	
Part program storage size	512 Kbyte(1280m)
Number of registerable programs	1000
Part program editing	
Program protect	
Extended Part program editing	
Memory card program edit & operation	
Background editing	

Setting and Display	
Status display	
Clock function	
Current position display	
Program commnent display	31 characters
Parameter setting and display	
Alarm display	
Alarm history display	
Operation history display	
Actual cutting feedrate display	
Servo setting screen	
Servo waveform display	
Maintenance information screen	
Multi-language display	
Data protection key	4 type
Self-diagnosis function	
Run hour and parts count display	

Data input/output	
External key input	
External workpiece number search	9999
Memory card input/output	
Screen hard copy	
Automatic data backup	
External data input	
RS-232C	

Others	
MDI/display unit	15″color LCD

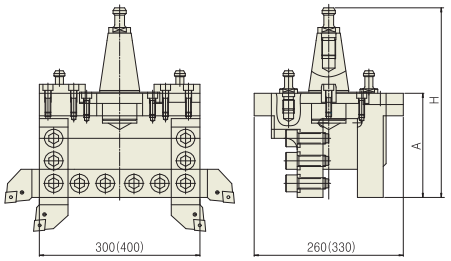
Optional Function

Optional Functions	
Stored stroke check 2, 3	
DNC operation	
Retraction for Rigid tapping	
High speed program check	
Single direction positioning	G60
Helical interpolation	Circular interpolation plus max. 2 axes linear interpolation
Variable lead thread cutting	
Polygon turning	
3rd / 4th reference point return	
Programmable mirror image	
MANUAL GUIDE i	
Spindle orientation	1 spindle
Tool offset pairs	64/99/200/400 pairs
Tool pair for tool management function	64/240/1000 tools
Part program storage size	1/2/4/8 Mbyte
Play back	
Remote diagnostic	
Reader / punch interface	Ch.2
Embedded ethernet	

Tool Holders (Option)

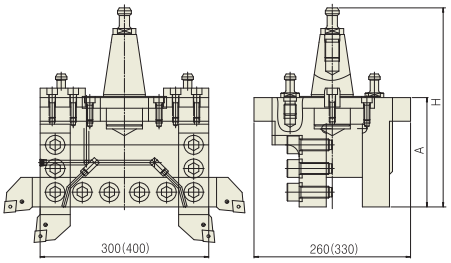
Unit : mm

Square tool holder (Standard type)



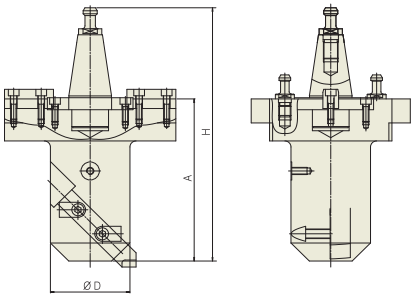
Model No.	A	H	Tool Size
TE25(40)-41000-0060	185	336.8	□ 50
TE25(40)-41000-0061	235	336.8	□ 50
TE25(40)-41000-0062	285	436.8	□ 50

Square tool holder (Through tool coolant)



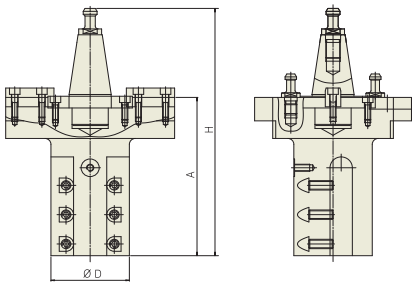
Model No.	A	H	Tool Size
TE25(40)-41000-0160	185	336.8	□ 50
TE25(40)-41000-0161	235	336.8	□ 50
TE25(40)-41000-0162	285	436.8	□ 50

Boring tool holder (BA type)



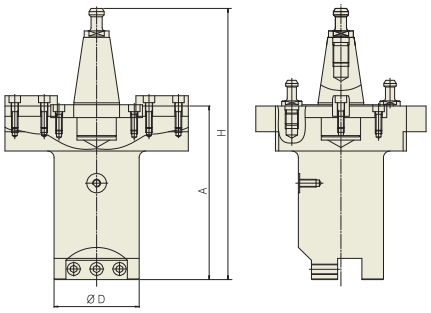
Model No.	A	D	H	Tool Size
TE25(40)-41000-5040	270	ø 130	421.8	□ 32
TE25(40)-41000-5041	320	ø 130	471.8	□ 32
TE25(40)-41000-5042	370	ø 130	521.8	□ 32
TE25(40)-41000-5043	420	ø 130	571.8	□ 32

Boring tool holder (BP type)



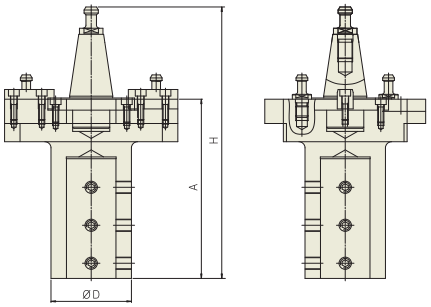
Model No.	A	D	H	Tool Size
TE25A(40)-41000-5140	270	ø 130	421.8	□ 32
TE25A(40)-41000-5141	320	ø 130	471.8	□ 32
TE25A(40)-41000-5142	370	ø 130	521.8	□ 32
TE25A(40)-41000-5143	420	ø 130	571.8	□ 32

Boring tool holder (BF type)



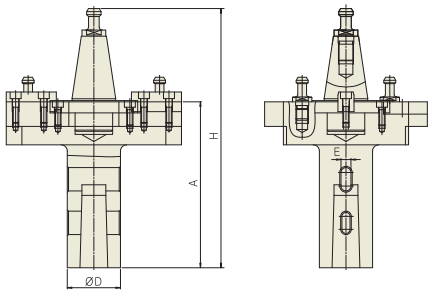
Model No.	A	D	H	Tool Size
TE25(40)-41000-5240	270	ø 130	421.8	□ 32
TE25(40)-41000-5241	320	ø 130	471.8	□ 32
TE25(40)-41000-5242	370	ø 130	521.8	□ 32
TE25(40)-41000-5243	420	ø 130	571.8	□ 32

Side lock holder



Model No.	A	D	H	Tool Size
TE25(40)-41000-5350	220	ø 80	371.8	ø 40
TE25(40)-41000-5360	220	ø 100	371.8	ø 50
TE25(40)-41000-5370	245	ø 100	396.8	ø 60
TE25(40)-41000-5380	295	ø 130	446.8	ø 80

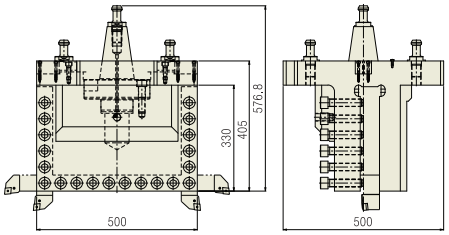
Morse taper holder



Model No.	A	D	H	Tool Size
TE25(40)-41000-5450	270	ø 80	421.8	MT # 5
TE25(40)-41000-5460	345	ø 110	496.8	MT # 6
TE25(40)-41000-5470	420	ø 130	571.8	MT # 7

Note. ( ) : 4050E/5060E

Square tool holder (VTB-100/120E)



ISO 9001 REGISTERED FIRM

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Note: Specifications and features are subject to change without prior notice.
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