

EFFICIENCY AND EXCELLENCE IN LARGE WORKPIECE MACHINING



- ▶ With table load up to 24,000 kg. It is most ideal for mold and forging dies, as well as heavy and large workpieces.
- ▶ Numerous configurations of Universal Compound Head to meet your diversified machining needs.
- ▶ Large diameter preloaded ballscrews on all three axes. High rigidity and high precision assure high positioning accuracy.
- ▶ Multiple selections of CNC controllers available with controlled axes up to five.

FV - XX XX

(x100 mm)

X Axis Travel

(x100 mm)

Y Axis Travel

FV-4224



Chip Auger

Standard chip augers convey metal swarfs to chip conveyor in the front.



Horizontal Chain Type ATC

- With tool changer arm, for ATC unit.
- 40 or 60 tools magazine to choose from.
- The magazine is fully enclosed to keep tools clean at all times, extending tool service life and ensuring high accuracy machining.

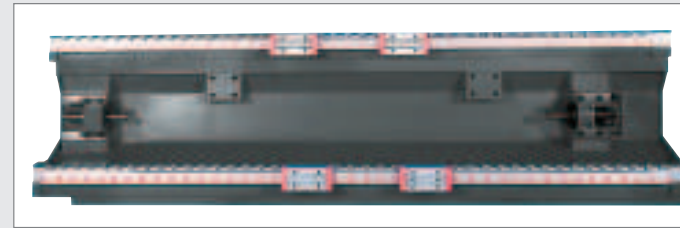


Vertical Chain Type ATC

- With tool changer arm, for ATC unit.
- Bi-directional, random tool selection.
- 32 or 40 tools magazine to choose from.



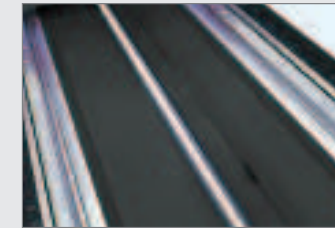
LARGE DIAMETER BALLSCREWS HEAVY DUTY LINEAR GUIDE WAYS



Extra Long Heavy Linear Ways

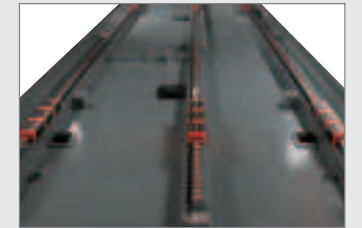
Precision preloaded ballscrews on all three axes.

Heavy-duty THK HSR linear guide ways on X-axis and SCHNEEBERGER roller linear guide ways on Y-axis.



Three Linear Ways

Three linear guide ways on the X-axis for models with table width greater than or equal to 2,200 mm.



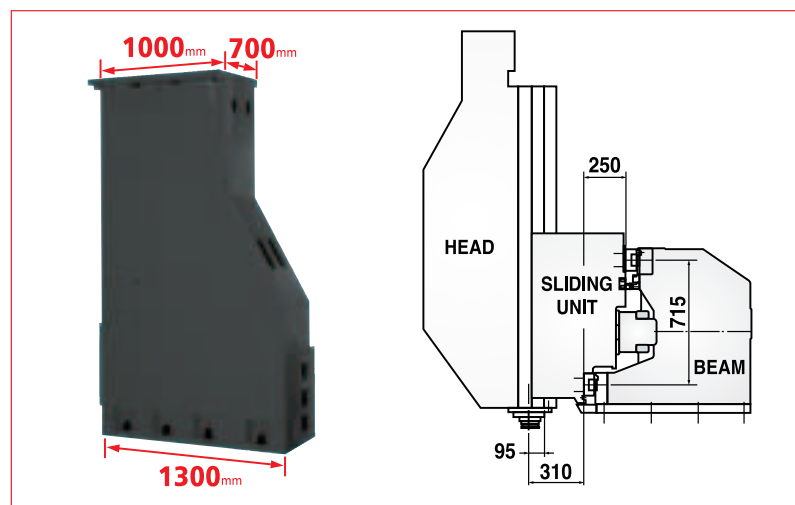
SHNEEBERGER Roller Type Linear Ways

Heavy-duty, roller type SHNEEBERGER linear guide ways are standard on Y-axis. This feature can also be incorporated as an option for X-axis.

HIGH RIGIDITY CONSTRUCTION CONTRIBUTES TO HIGH PERFORMANCE

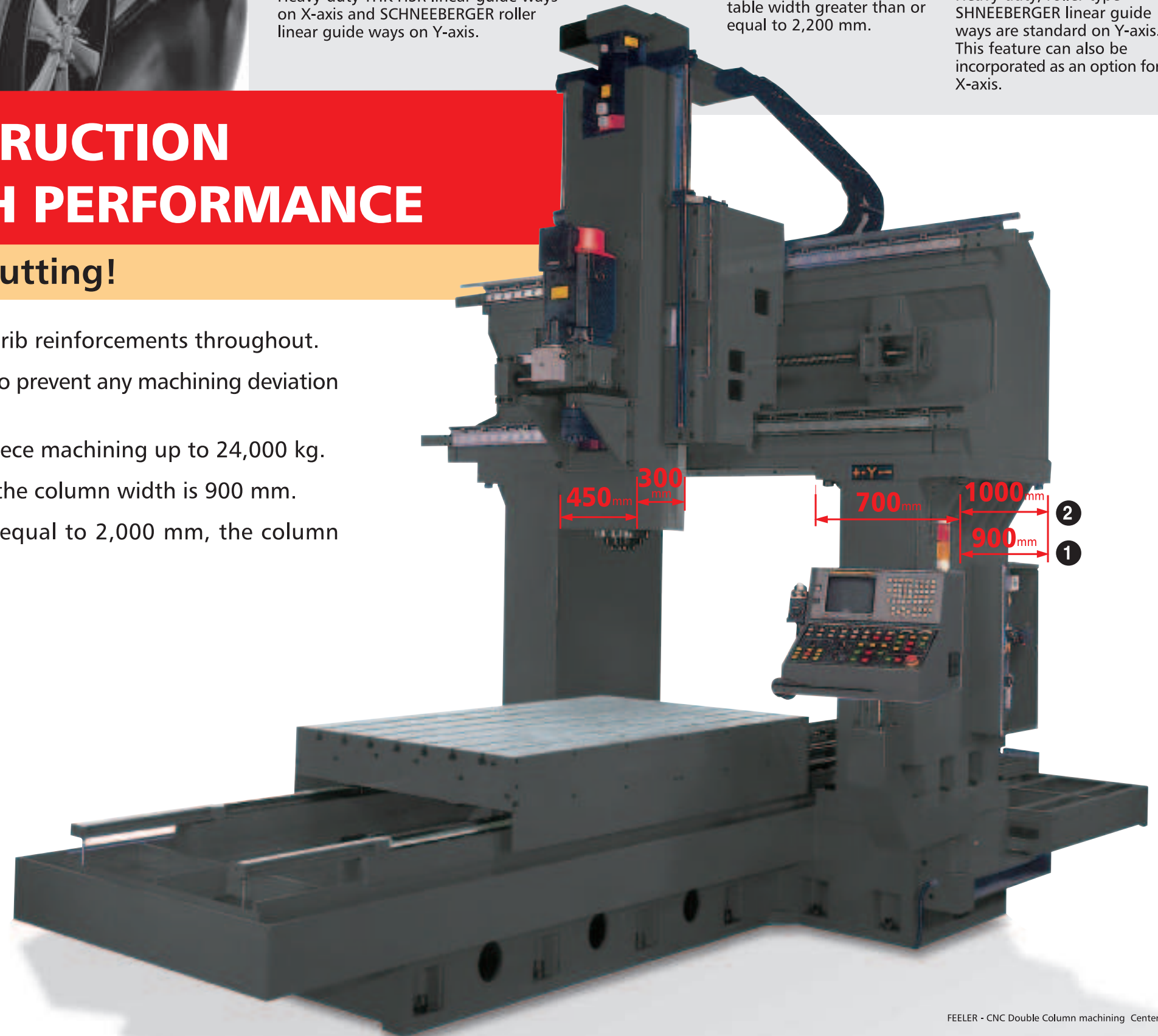
Built for HEAVY and PRECISION cutting!

- ▶ Base structure built with box-type construction and rib reinforcements throughout.
- ▶ Table is fully supported throughout the entire stroke to prevent any machining deviation due to overhang.
- ▶ Ample space between two columns enables large piece machining up to 24,000 kg.
- ▶ For models with column distance up to 1,600 mm, the column width is 900 mm.
- ▶ For models with column distance greater than or equal to 2,000 mm, the column width is 1,000 mm.

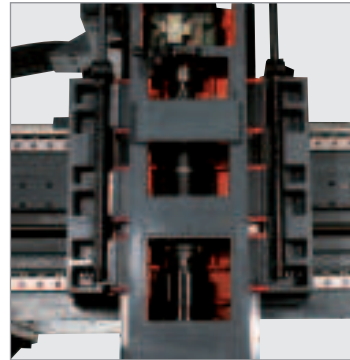


ROBUST FRAME

For models with column distance greater than (or equal to) 2,500 mm, optional larger column is also available.

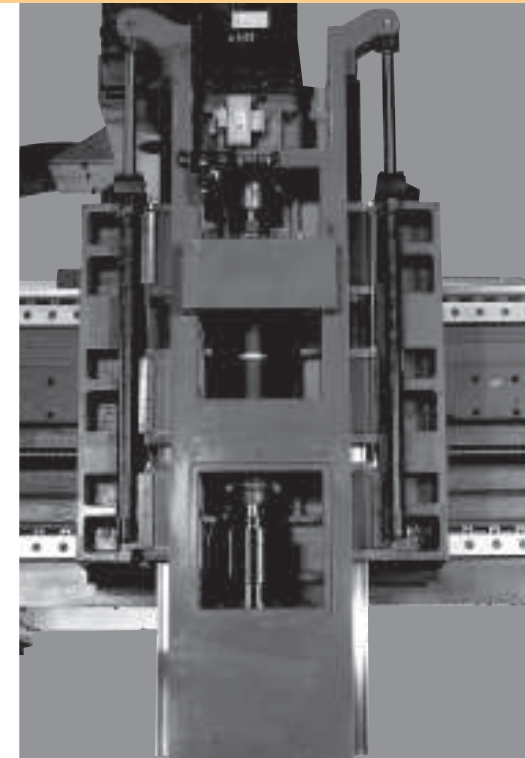
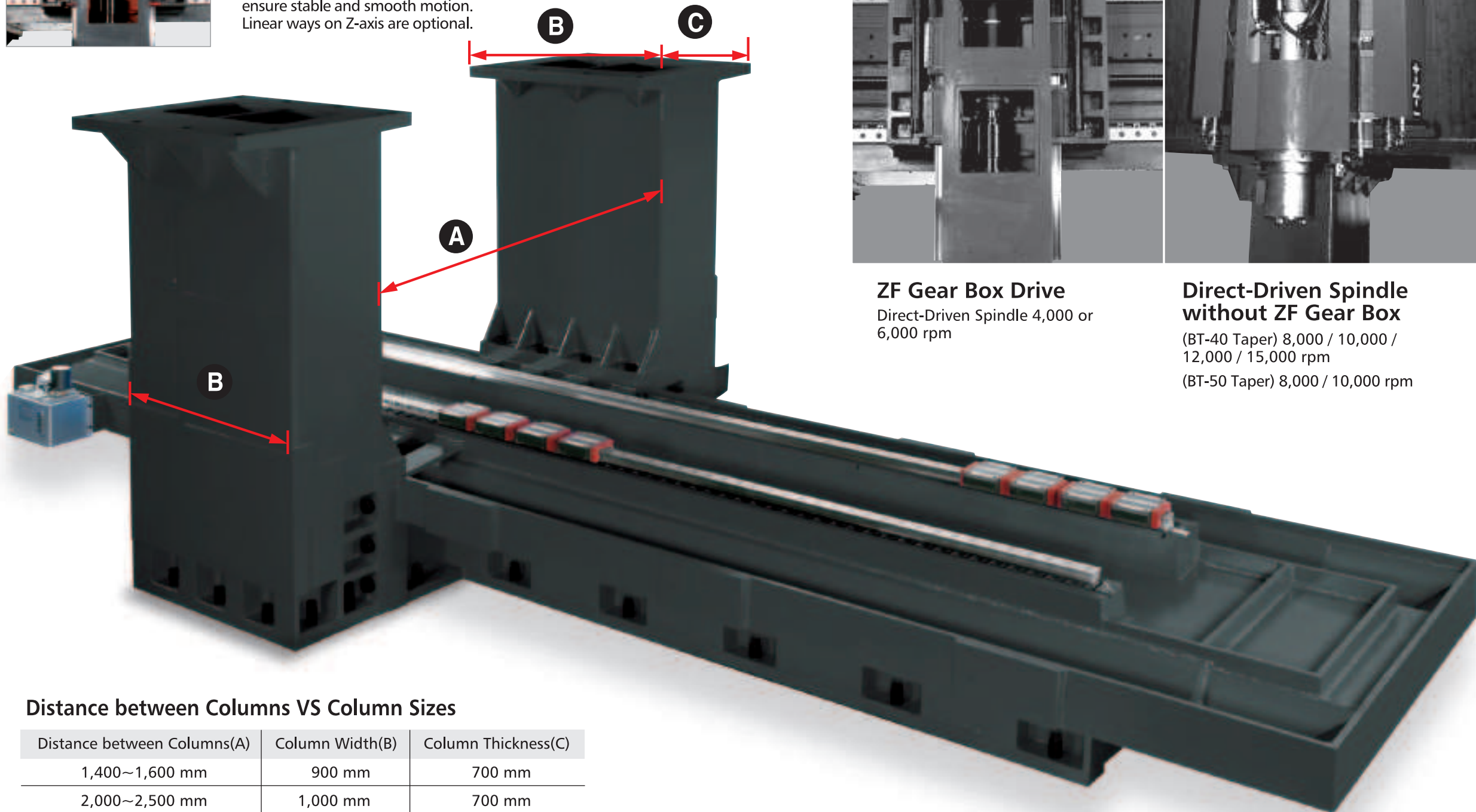


SUPER RIGIDITY AND STABILITY-PERFECT STRUCTURE DESIGN TO OPTIMIZE MACHINING STABILITY!



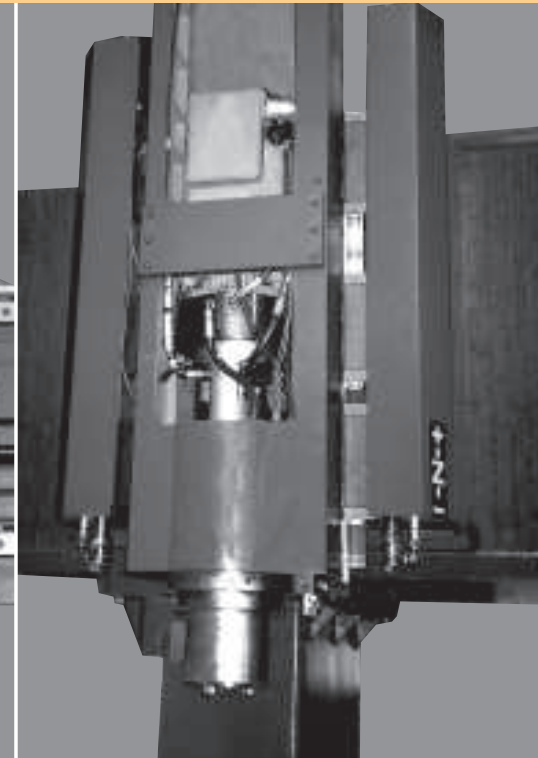
Z-axis Counter-balanced by Hydraulic Cylinder

Z-axis movement is counter-balanced by hydraulic cylinder to ensure stable and smooth motion. Linear ways on Z-axis are optional.



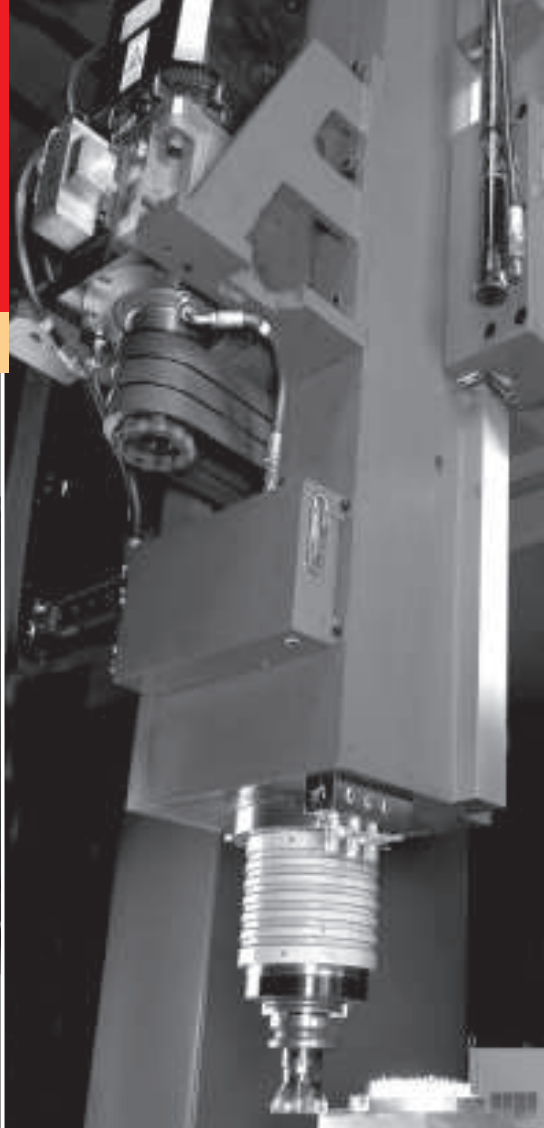
ZF Gear Box Drive

Direct-Driven Spindle 4,000 or 6,000 rpm



Direct-Driven Spindle without ZF Gear Box

(BT-40 Taper) 8,000 / 10,000 / 12,000 / 15,000 rpm
(BT-50 Taper) 8,000 / 10,000 rpm



Belt Type Spindle with ZF Gear Box

4,000 / 6,000 rpm (Standard)
8,000 rpm (Optional)



The accumulator can supply the hydraulic to cylinder promptly to make Z-axis movement more smooth whenever necessary.

Distance between Columns VS Column Sizes

Distance between Columns(A)	Column Width(B)	Column Thickness(C)
1,400~1,600 mm	900 mm	700 mm
2,000~2,500 mm	1,000 mm	700 mm
2,800 mm or above	1,000 mm	1,000 mm

VARIOUS SPINDLE SELECTIONS AVAILABLE



BT-50 Short Nose Spindle (Standard)

Heavy cutting 4,000 rpm short nose design BT-50 spindle with 100 mm bearing is standard. When used in conjunction with ZF Planetary Gearbox, output torque can reach 572 N-m. Optional 6,000 rpm spindle is also available.



BT-40 Long Nose Spindle (Optional)

Extended length, 10,000 rpm BT-40 spindle with 70 mm bearing is also available. In addition, you can choose 12,000 rpm with oil mist lubrication.



BT-50 Extra Long Spindle (Optional)

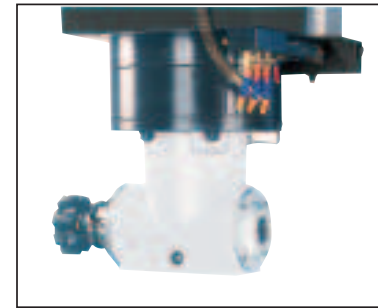
4,000 rpm BT-50 spindle with extended length is suitable for deep-hole machining. 6,000 rpm is also available for large mold applications.



HSK-A63 Built-in Type Spindle: 20,000 rpm Speed (Optional)

OPTIONAL: 20,000 rpm spindle with built-in motor and max. torque on 96 N-m. This HSK-A63 spindle is equipped with oil mist lubrication and 3-piece ceramic bearings to guarantee extreme robust performance and reliability.

OPTIONAL MILLING HEADS

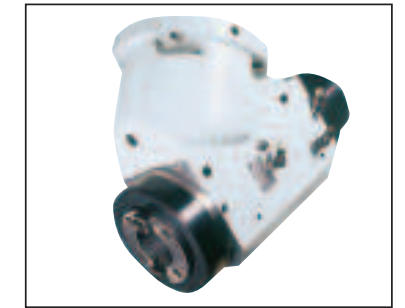


Hydraulic-clamped 90° Angular Milling Head with four positions at 0°, 90° and 270°

- Manual
- Automatic
- 2,000 rpm / 3,000 rpm



2,500 / 3,000 rpm manual Universal Milling Head



45° Angular Milling Head (30°, 72°, and 75° are also available)



3,500 rpm, 300 / 500 mm lengthened Extended Head with tool clamp / unclamp

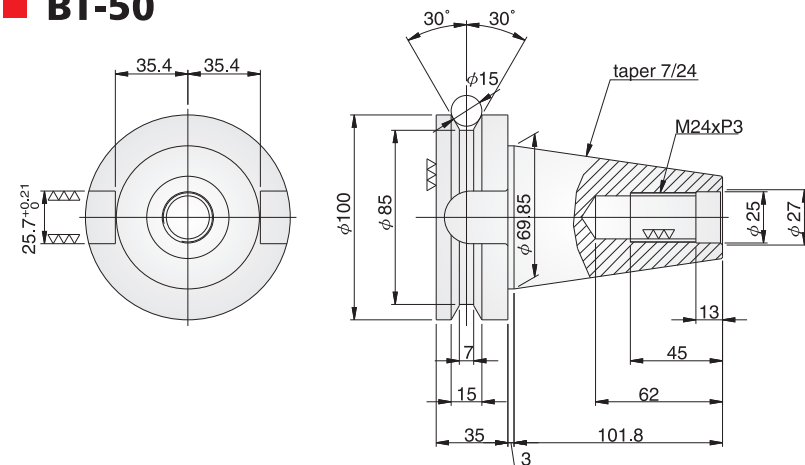


4th and 5th axes with automatic 5° positioning

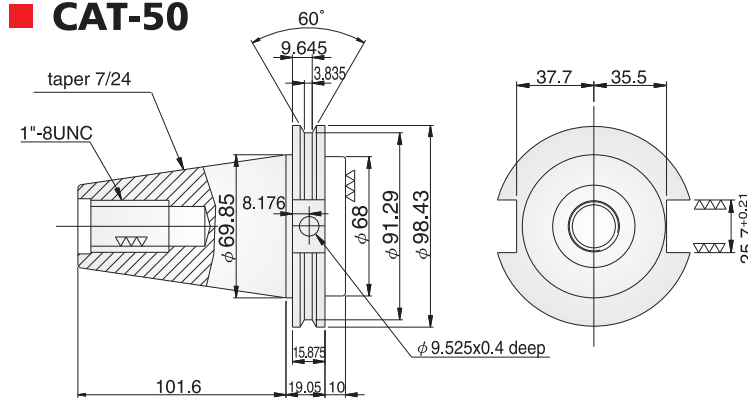


FLOOR & SERIES LAYOUT

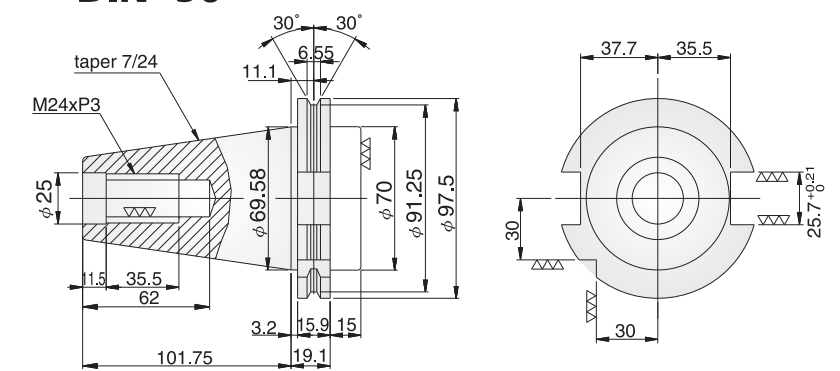
BT-50



CAT-50



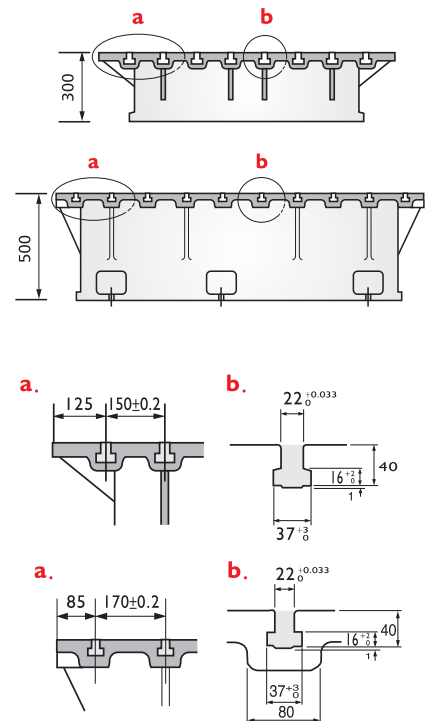
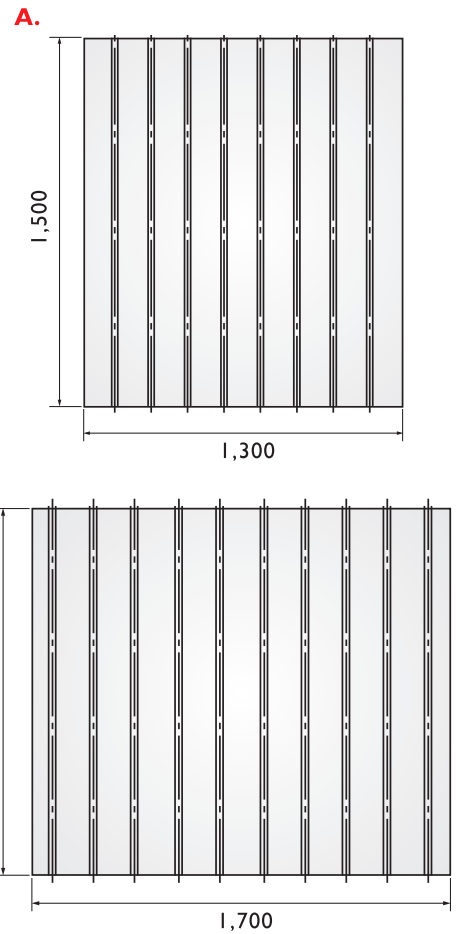
DIN -50



AUXILIARY TABLE DIMENSIONS

- A. 1,500 x 1,300 x 300 mm
- B. 1,500 x 1,700 x 500 mm
- C. 1,500 x 1,700 x 200 mm
- D. 2,200 x 2,000 x 300 mm

Other sizes available upon request

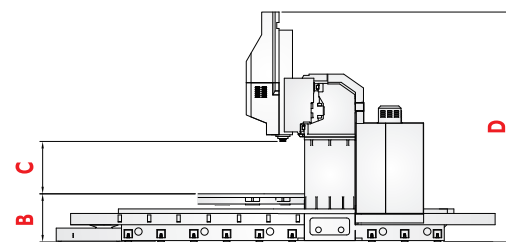
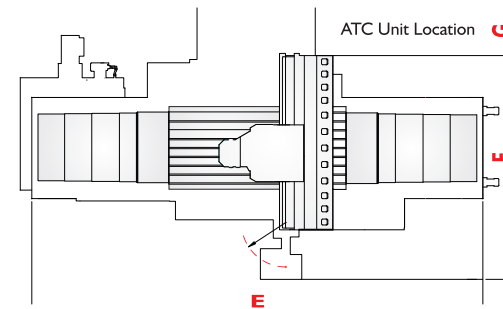
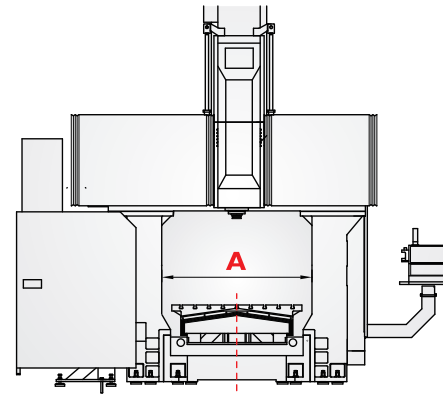


FLOOR SPACE & MACHINE LAYOUT

Z-AXIS STROKE

C: Spindle to Table Top

1. Standard Spindle: 220~970 (270~1,170 / 270~1,470)
2. Long Spindle: 70~820 (120~1,020 / 120~1,320)
3. Long Spindle and High Column: 270~1,020 for Z=750, 420~1,320 for Z=900



D: M/C Height

1. 4,120 (Z-750)
2. 4,470 (Z-900)
3. 5,200 (Z-1,200)

FLOOR & SERIES LAYOUT

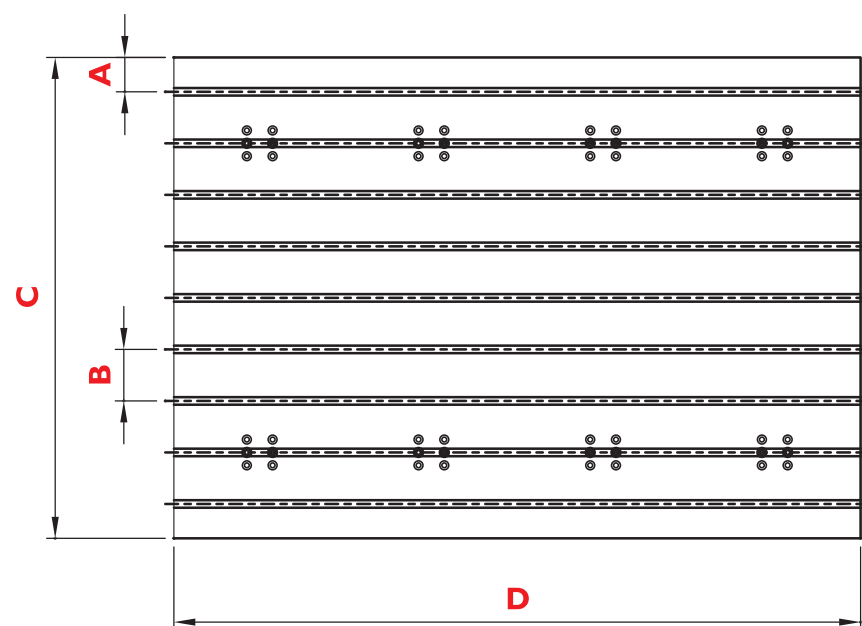
Unit:mm

FV Double Column M/CS	A Between Two Columns	B Table to Ground	C Spindle to Table Top	D M / C Height	E M / C Length	F Width	G ATC Area
FV-1712	1400	850	1. Standard Spindle: 220-970(270-1170, 270-1470) 2. Long Spindle: 70-820(120-1020, 120-1320) 3. Long Spindle & High Column: 270-1020 For Z=750, 420-1320 For Z=900	1.4120 (Z-750) 2.4470 (Z-900) 3.5200 (Z-1200)	4720	3700	Approx. 850 1050
FV-2212	1400	850			5560	3700	
FV-2812	1400	850			6800	3700	
FV-3212	1400	850			7520	3700	
FV-2215	1600	850			5520	3900	
FV-2219	2000	875			5520	4350	
FV-3215	1600	850			7630	3900	
FV-3219	2000	875			7630	4350	
FV-3224E	2500	875			7630	4850	
FV-3224	2500	875			7630	4850	
FV-3233	2800	895			7630	5550	
FV-4215	1600	850			10085	3900	
FV-4219	2000	875		10085	4350		
FV-4224E	2500	875		10085	4850		
FV-4224	2500	875		10085	4850		
FV-4233	2800	895		10085	5550		
FV-4236	3200	895		10085	5950		
FV-5219	2000	875		12085	4350		
FV-5224E	2500	875		12085	4850		
FV-5224	2500	875		12085	4850		
FV-5233	2800	895		12085	5550		
FV-5236	3200	895		12085	5950		
FV-5240	3500	895		12085	6250		
FV-6236	3200	975		15655	5950		
FV-6240	3500	975	15655	6250			
FV-7237	3200	975	16555	5950			
FV-7240	3500	975	16555	6250			
			1.4200(Z-750) 2.4550(Z-900) 3.5280(Z-1200)				

(L) Z-Axis Linear Guide Way

TABLE DIMENSIONS

Unit:mm



FV Double Column M/CS	A Side Width	B Slots Width	C Width	D Length	FV Double Column M/CS	A Side Width	B Slots Width	C Width	D Length
FV-1712	150	125	1050	1600	FV-4224	100	200	2200	4000
FV-2212	125	125	1000	2100	FV-4233	50	200	2500	4000
FV-2812	125	125	1000	2700	FV-4236	50	200	2900	4000
FV-3212	125	125	1000	3100	FV-5219	85	170	1700	5000
FV-2215	100	150	1400	2000	FV-5224E	200	200	2000	5000
FV-2219	85	170	1700	2000	FV-5224	100	200	2200	5000
FV-3215	100	150	1400	3000	FV-5233	50	200	2500	5000
FV-3219	85	170	1700	3000	FV-5236	50	200	2900	5000
FV-3224E	200	200	2000	3000	FV-5240	100	200	3000	5000
FV-3224	100	200	2200	3000	FV-6236	50	200	2900	6000
FV-3233	50	200	2500	3000	FV-6240	100	200	3000	6000
FV-4215	100	150	1400	4000	FV-7237	50	200	2900	6000
FV-4219	85	170	1700	4000	FV-7240	100	200	3000	6000
FV-4224E	200	200	2000	4000					

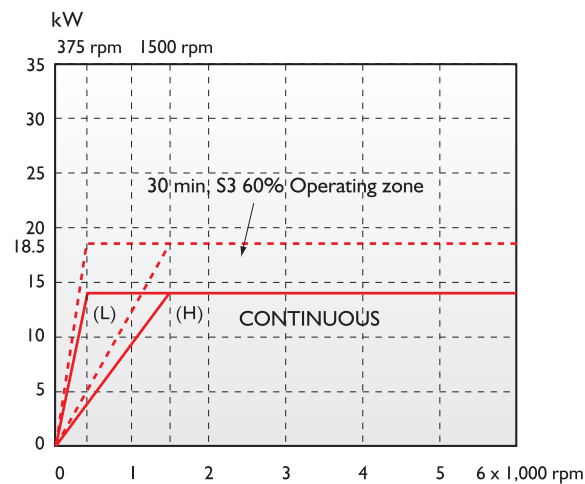
FV SERIES DOUBLE COLUMN MACHINING CENTERS

FV - $\frac{XX}{A}$ $\frac{XX}{B}$ A: (x 100 mm) X Axis Travel
B: (x 100 mm) Y Axis Travel

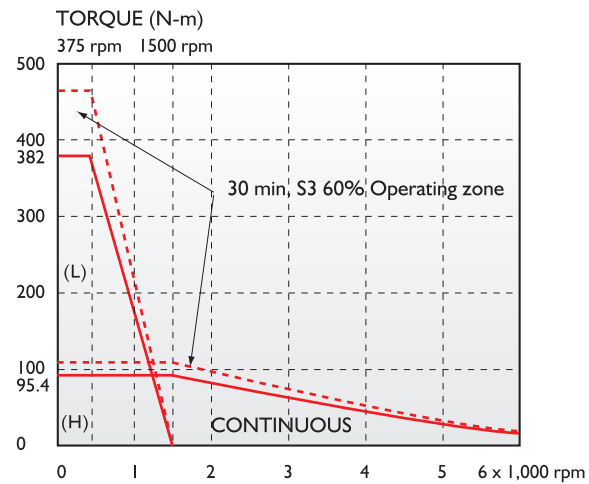
MODEL	Unit	FV-1712	FV-2212	FV-2812	FV-3212	FV-2215	FV-2219	FV-3215	FV-3219	FV-3224E	FV-3224	FV-3233	FV-4215	FV-4219	FV-4224E	FV-4224	
TABLE																	
Overall Size	mm	1,600x1,050	2,100x1,000	2,700x1,000	3,100x1,000	2,000x1,400	2,000x1,700	3,000x1,400	3,000x1,700	3,000x2,000	3,000x2,200	3,000x2,500	4,000x1,400	4,000x1,700	4,000x2,000	4,000x2,200	
T Slots	mm	22															
Maximum Loading	ton	3.5	5	6	7	6	7	9	10	11	12	12	10	12	12	14	
TRAVEL																	
X Axis	mm	1,700	2,200	2,800	3,200	2,160	2,160	3,200	3,200	3,200	3,200	3,200	4,200	4,200	4,200	4,200	
Y Axis	mm	1,200					*1,500	*1,900	*1,500	*1,900	2,400	2,400	3,300	*1,500	*1,900	2,400	2,400
Z Axis	mm	750 (900, 1,200)										750 (900, 1,200)					
DISTANCES																	
Between Two Columns	mm	1,400					1,600	2,000	1,600	2,000	2,500	2,500	2,800	1,600	2,000	2,500	2,500
Spindle Nose To Table Top	mm	1. Standard Spindle: 220~970 for Z=750 (270~1,170 Z=900, 270~1,470 Z=1,200) 2. Long Spindle: 70~820 for Z=750 (120~1,020 Z=900, 120~1,320 Z=1,200) 3. Long Spindle & High Column: 270~1,020 for Z=750 (420~1,320 Z=900)															
SPINDLE																	
Taper		7/24 taper No.50 (No.40) BT-50 (DIN.69871) (CAT-50) (BT-40) (HSK-A63)										7/24 taper No.50 (No.40) BT-50 (DIN.69871) (CAT-50) (BT-40) (HSK-A63)					
Speed	rpm	4000 (6000,8000,BT-50)(8000,10000,12000,BT-40)(12000,15000,BBT-40)(15000,20000,HSK-A63)										4000 (6000,8000,BT-50)(8000,10000,12000,BT-40)(12000,15000,BBT-40)(15000,20000,HSK-A63)					
Motor Fanuc, Mitsubishi	kW	18 / 15 (26 / 22)										18 / 15 (26 / 22)					
Heidenhain, Siemens, Selca	kW	20.5 / 15 (30/22)										20.5 / 15 (30/22)					
SPINDLE																	
Cutting Feedrate	mm / min	1-5,000										1-5,000					
Rapid Feedrate X / Y / Z	m / min	12 (15) / 12 (15) / 10 (12)										12 (15) / 12 (15) / 10 (12)					
Minimum Setting	mm	0.001										0.001					
ATC (AUTOMATIC TOOL CHANGER)																	
No.of ATC	tools	0 (20, 24, 32, 40, 60)										0 (20, 24, 32, 40, 60)					
Max. Tool (Dia / Length)	mm	Ø110 or Ø220 No Adjacent Tool / Length 350										Ø110 or Ø220 No Adjacent Tool / Length 350					
Max. Tool Weight	kg	18 (BT-50)										18 (BT-50)					
Tool To Tool (60 Hz)	sec.	8 (ARM TYPE)										8 (ARM TYPE)					
COOLANT & LUBRICATION																	
Coolant Tank Volume	ℓ	395					320	400	320	400	500	600	420	635	750		
Hydraulic Tank Volume	ℓ	80										80					
Lubrication Tank Volume	ℓ	6										8					
MISCELLANEOUS																	
Machine Net Weight	ton	19	20	22.5	23.5	22	26.5 (27)	25.5	29 (29.5)	32 (33)	38 (38.5)	41	31	34.5 (35)	38 (38.5)	42.5 (43)	
Power Required	kVA	45										45					50
Pneumatic Required	kg / cm ²	7										7					
Hydraulic Required	kg / cm ²	70										70					
Controller		FANUC 21iMB (18iMB / 5)					MELDAS (M64 / M65 / M700)			SIEMENS 840D		HEIDENHAIN iTNC-530		SELCA S3045 (S3045D)			

() OPTION * Specifications are subject to change without prior notice.

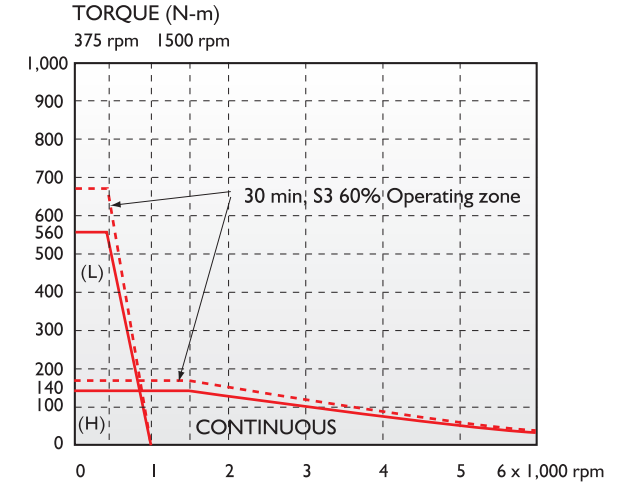
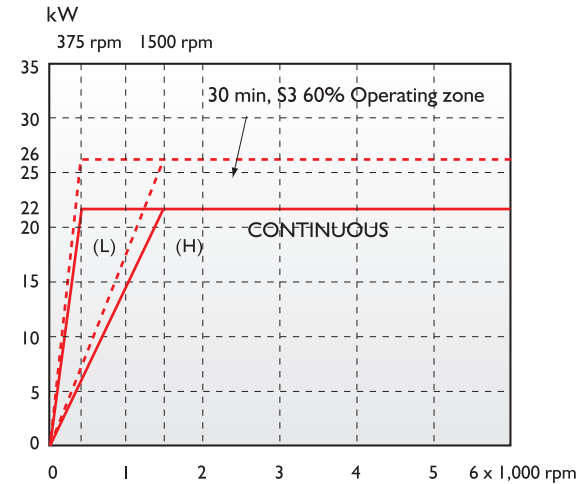
TOOLING SYSTEM



15/18.5 kW spindle motor (FANUC α 15i) with 4:1 ratio ZF 2K250 gearbox



22/26 kW spindle motor (FANUC α 22i) with 4:1 ratio ZF 2K250 gearbox



FV SERIES DOUBLE COLUMN MACHINING CENTERS

MODEL	Unit	FV-4233	FV-4236	FV-5219	FV-5224E	FV-5224	FV-5233	FV-5236	FV-5240	FV-6236	FV-6240	FV-7237	FV-7240
TABLE													
Overall Size	mm	4,000x2,500	4,000x2,900	5,000x1,700	5,000x2,000	5,000x2,200	5,000x2,500	5,000x2,900	5,000x3,000	6,000x2,900	6,000x3,000	6,000x2,900	6,000x3,000
T Slots	mm	22						22					
Maximum Loading	ton	14	14	15	15	18	18	20	20	20	24	20	24
TRAVEL													
X Axis	mm	4,200	4,200	5,200	5,200	5,200	5,200	5,200	5,200	6,200	6,200	7,200	7,200
Y Axis	mm	3,300	3,600	*1,900	2,400	2,400	3,300	3,600	4,000	3,600	4,000	3,700	4,000
Z Axis	mm	750 (900, 1,200)						750 (900, 1,200)					
DISTANCES													
Between Two Columns	mm	2,800	3,200	2,000	2,500	2,500	2,800	3,200	3,500	3,200	3,500	3,200	3,500
Spindle Nose To Table Top	mm	1. Standard Spindle: 220~970 for Z=750 (270~1, 170 Z=900, 270~1,470 Z=1,200) 2. Long Spindle: 70~820 for Z=750 (120~1,020 Z=900, 120~1,320 Z=1,200) 3. Long Spindle & High Column: 270~1,020 for Z=750 (420~1,320 Z=900)											
SPINDLE													
Taper		7/24 taper No.50 (No.40) BT-50 (DIN.69871) (CAT-50) (BT-40) (HSK-A63)						7/24 taper No.50 (No.40) BT-50 (DIN.69871) (CAT-50) (BT-40) (HSK-A63)					
Speed	rpm	4000 (6000,8000,BT-50)(8000,10000,12000,BT-40)(12000,15000,BBT-40)(15000,20000,HSK-A63)						4000 (6000,8000,BT-50)(8000,10000,12000,BT-40)(12000,15000,BBT-40)(15000,20000,HSK-A63)					
Motor Fanuc, Mitsubishi	kW	18 / 15 (26 / 22)						18/15(26/22)					
Heidenhain, Siemens, Selca	kW	20.5 / 15 (30 / 22)						20.5 / 15 (30 / 22)					
SPINDLE													
Cutting Feedrate	mm / min	1-5,000						1-5,000					
Rapid Feedrate X / Y / Z	m / min	12 (15) / 12 (15) / 10 (12)			10 / 12 / 10 (12)			10 (12) / 10 (12) / 10 (12)					
Minimum Setting	mm	0.001						0.001					
ATC (AUTOMATIC TOOL CHANGER)													
No.of ATC	tools	0 (20, 24, 32, 40, 60)						0 (20, 24, 32, 40, 60)					
Max. Tool (Dia / Length)	mm	Ø125 or Ø200 No Adjacent Tool / Length 350						Ø125 or Ø200 No Adjacent Tool / Length 350					
Max. Tool Weight	kg	18 (8,BT-40)						18 (8,BT-40)					
Tool To Tool (60 Hz)	sec.	8 (ARM TYPE)						8 (ARM TYPE)					
COOLANT & LUBRICATION													
Coolant Tank Volume	ℓ	700	635	750	700	750	700	750	1600				
Hydraulic Tank Volume	ℓ		80						80				
Lubrication Tank Volume	ℓ		8						8				
MISCELLANEOUS													
Machine Net Weight	ton	46	53	38 (38.5)	42 (43)	48 (49)	53	55	56	70	72	77	82
Power Required	kVA	50						50					
Pneumatic Required	kg / cm ²	7						7					
Hydraulic Required	kg / cm ²	70						70					
Controller		FANUC 21iMB (18iMB / 5)			MELDAS (M64 / M65 / M700)		SIEMENS 840D		HEIDENHAIN iTNC-530		SELCA S3045 (S3045D)		

() OPTION * Specifications are subject to change without prior notice.

STANDARD ACCESSORIES

- * Glazed window type splash guard
- * Spindle oil cooler
- * Automatic lubrication system
- * Spindle air blast system
- * Working lamp
- * Alarm lamp for abnormal Situation
- * M.P.G.
- * Indication lamp for Dwell & End of Job
- * Levelling bolts and pads
- * BT50 spindle
- * RS-232 terminal interface port / RJ45
- * Machine & control manuals
- * Toolbox with spanners & wrenches
- * Screw auger & chain type chip conveyors
- * Foot switch

(E) Distance Between Columns 2,500 mm 2 Linear Ways on X-Axis, Smaller Table

- * Y Axis travel will be less than 100 mm when arm / carrousel type ATC are applied.
- * The ATC information will be different on different components.
- * Z-axis: 1,200 mm with limitation of options.

OPTIONAL ACCESSORIES

- * Auxiliary work table
- * CNC rotary table
- * Tool magazine
- * Tool length measurement
- * Workpiece probe system
- * 3 axes linear scale
- * Coolant through spindle
- * Air conditioner at cabinet
- * Thermal distortion compensation module
- * Optional milling heads(90° / 75° / 72° / 45° / 30° / B&C Axes) for manual or auto position
- * Z axis linear way

FV SERIES



INNOVALUE & EXCELLENCE

 FAIR FRIEND ENT. GROUP
FAIR FRIEND ENTERPRISE CO., LTD.

HEADQUARTERS

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