FV series

FV SERIES

5 Axes Vertical Machining Centers

AWEA
THE ULTIMATE MACHINING POWER

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FV series | 5 Axes Vertical Machining Center

Derived from AWEA's mature R&D technology and manufacturing capability, FV series is especially designed for medium and small intricate parts machining. FV series is equipped with high efficiency direct drive spindle and strong roller linear guide ways, combines with high performance A / C axes trunnion table to provide you with high productivity and comprehensive 5 axes cutting solution. FV series has the best cost-performance ratio among the 5 axes machines in the same travel range, which meets your various needs for today and tomorrow.

Aerospace

Automobile

Biomedical & Health equipment

FV series | Superior Rigidity Structure

The Finite Element Analysis (FEA) provides optimal machine design and light-weight structure while ensuring superior machine rigidity.

A Tool magazine

The tool magazine is firmly supported by column structure, providing reliable and accurate tool exchange.

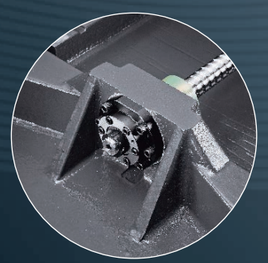
B Column structure

△ (Delta) Wide span column structure provides optimal machining rigidity. The headstock retains stability and accuracy even under high speed traveling.

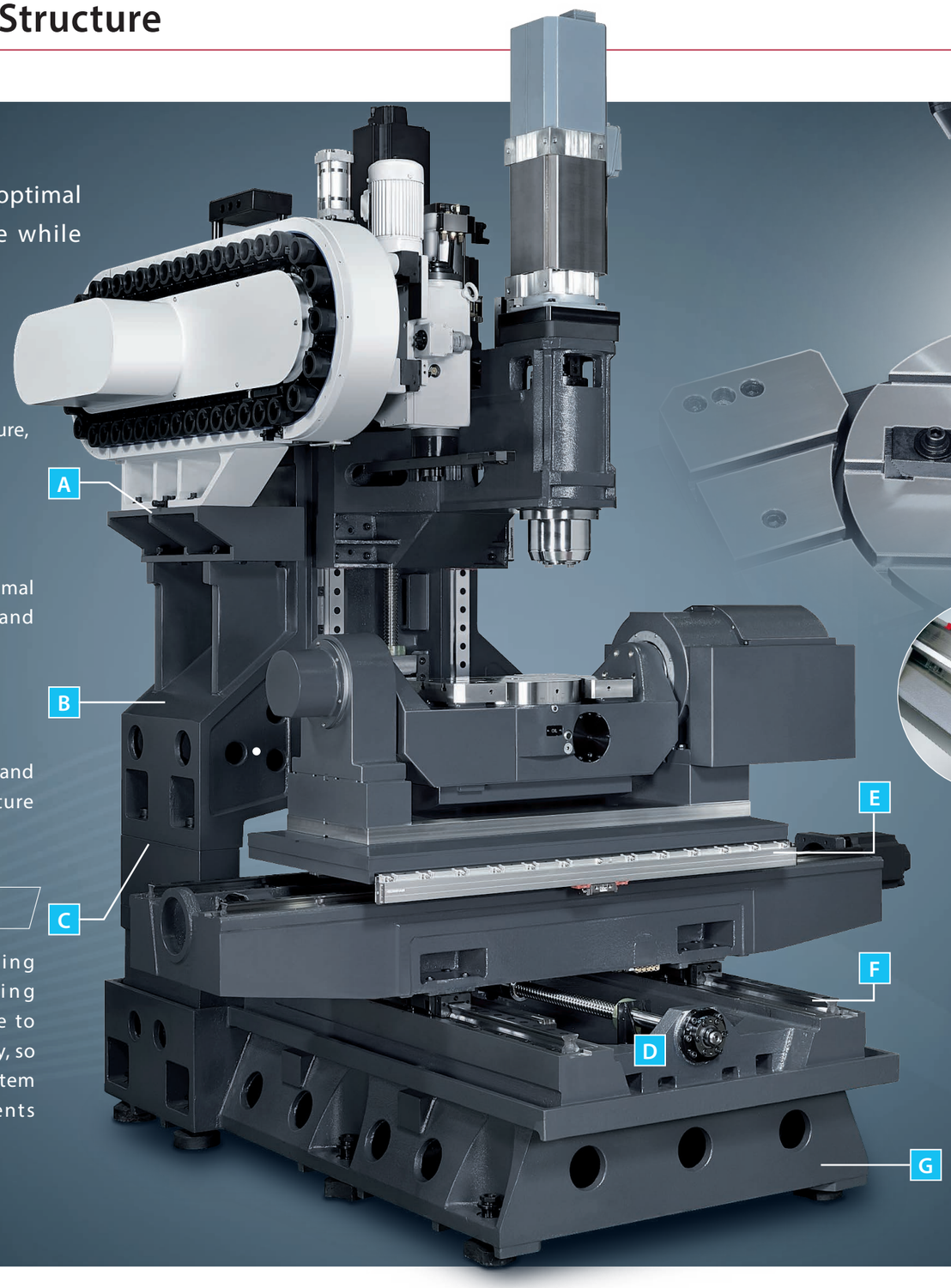
C Hand scraped

The contact surfaces of the column and bed are all hand scraped to ensure precision assembly, strong structure and loading balance.

D One-piece ball screw support design



One-piece ball screw driving motor support and bearing support enable cutting force to spread evenly into casting body, so it efficiently ehances axial system of entire rigidity and prevents deformation of ball screw.

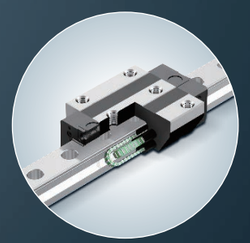


E High resolution linear scale

The optional high resolution linear scales ensure optimal positioning and repeatability accuracy.

F Superior rigidity linear guide way

Roller type linear guide way provides the advantages of superior rigidity for heavy cutting and agile response in machining.



G Casting bed

The MEEHANITE casting bed provides solid support to ensure ultimate dynamic accuracy.

(Casting structure of FV-960 model shown)

FV series | High Performance Trunnion Table

High performance A/C axes trunnion table provides simultaneous 5 axes machining or 4+1 axes multi-face machining capability which fulfills various machining requirements.

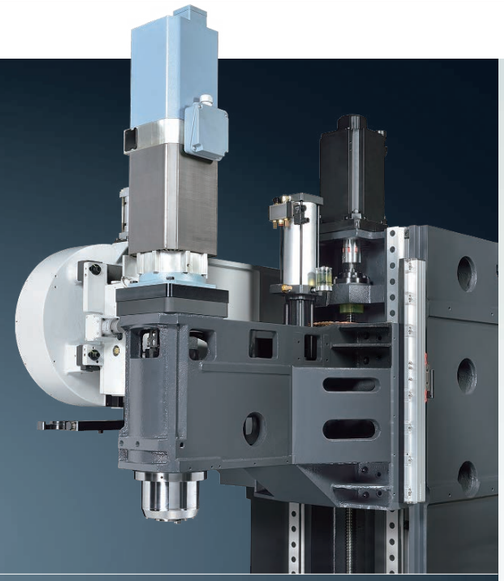
Model	FV-560	FV-960
Table size	Ø210 mm	560 x 365 mm
Table diameter	Ø210 mm	Ø350 mm
T-slot dimensions	12H7 mm	12H7 mm
Table load capacity	0° : 75 kg	0° : 200 kg
	0°~ 90° : 50 kg	60°~ 90° : 100 kg
Min. table index	0.001°	0.001°

Model	FV-560	FV-960
A-axis swiveling range	-100°~ +100°	-42°~ +120°
C-axis rotary range	360°	360°
Max. A-axis speed	44.4 rpm	13.3 rpm
Max. C-axis speed	44.4 rpm	22.2 rpm
Positioning accuracy (A / C)	50/20 arc-sec	45/15 arc-sec
Repeatability (A / C)	8/4 arc-sec	8/6 arc-sec

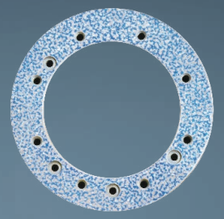
Specifications are subject to change without notice.

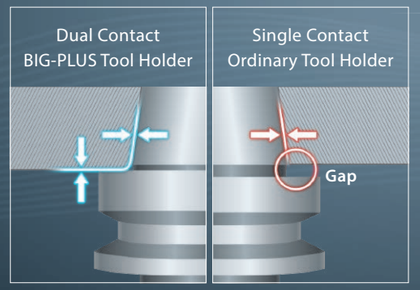
(Trunnion table of FV-960)

FV series | High Speed, High Power Spindle



- Direct-driven spindle efficiently isolates heat generated from motor thus reduces deformation and increases machining accuracy.
- Floating type hydraulic tool release device eliminates pressure on the spindle bearing when releasing a tool.
- The contact surfaces between headstock and spindle is precisely hand scraped to ensure optimal performance and precision.





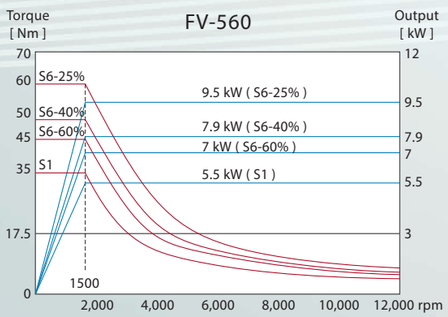
Dual contact spindle taper design Std.

The FV series employs the advanced Dual Contact Spindle taper design, which not only avoids the taper run out but also enhances cutting rigidity. This is especially suitable for high speed machining.

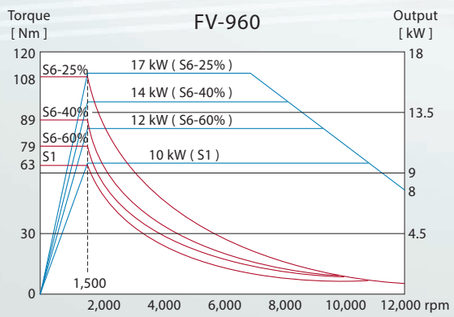
(BBT, BCV, BDV, etc. can be selected according to actual demands.)

- The high power HEIDENHAIN spindle motors, 12,000 / 15,000 rpm are available for option to meet various machining demands.

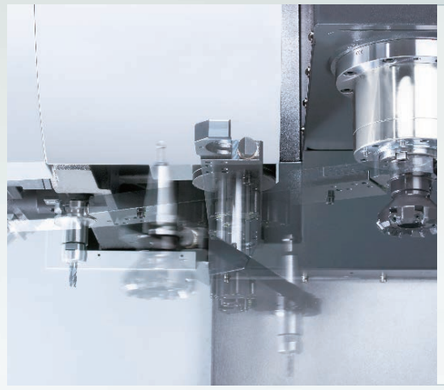
12,000 rpm Direct Drive Spindle



12,000 rpm Direct Drive Spindle



FV series | Optimal Configuration

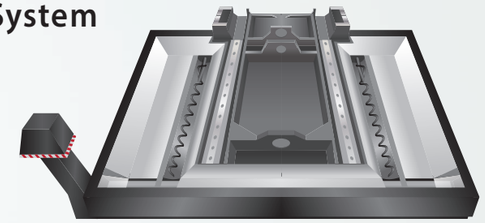


High Efficiency ATC System

Equipped as standard the arm type automatic tool exchange system featuring random tool call to reduce time in tool exchange and enhance processing efficiency.

High Reliability Chip Removal System

Comprehensive chip removal system consists of chip wash down, chip augers and chip conveyor to provide high efficiency and reliability for chip removal.



(For FV-960 only)

Multi-Function Controller System

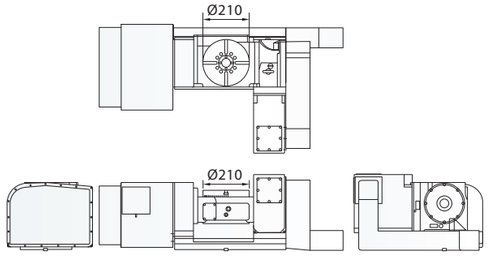
The HEIDENHAIN TNC640 features optimized motion control, short block processing time and special control strategies which enables reaching high machining efficiency and optimal contour control - particularly when machining 2-D or 3-D contours.

FV series | Dimensions

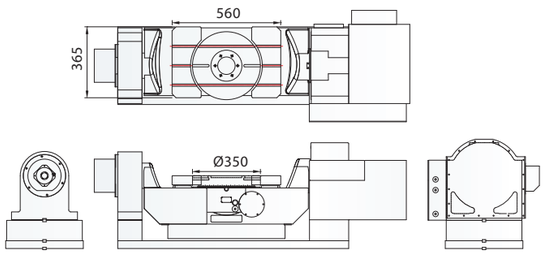
(Unit : mm)

Table Dimensions

FV-560

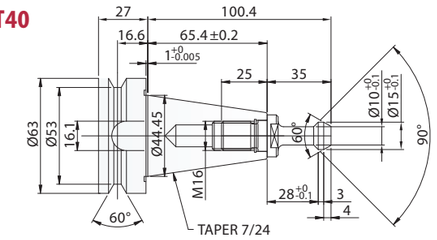


FV-960



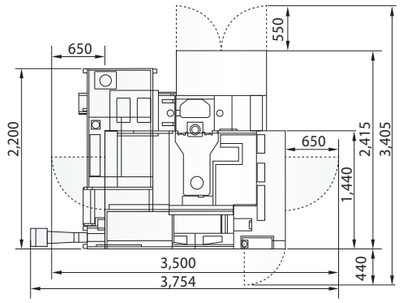
Tool Shank Dimensions

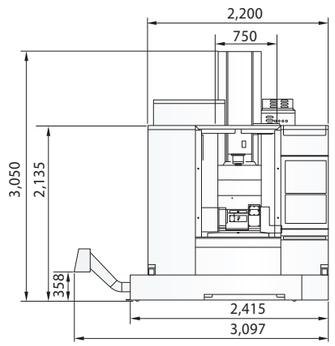
BBT40



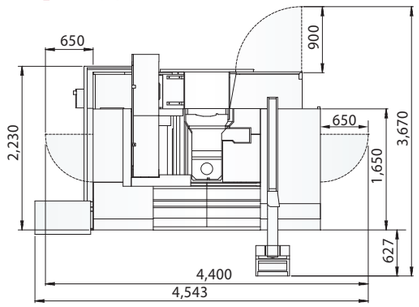
Machine Dimensions

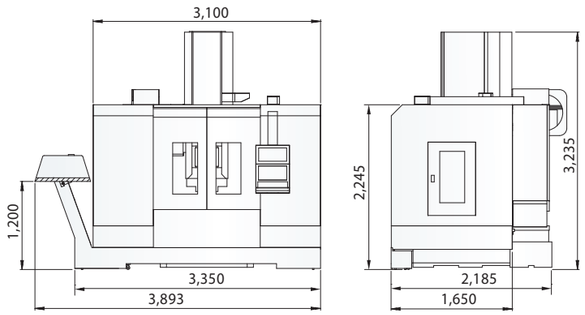
FV-560





FV-960





FV series | Specifications

		FV-560	FV-960
SPECIFICATIONS			
X-axis travel	mm	560	960
Y-axis travel	mm	510	600
Z-axis travel	mm	460	480
A-axis swiveling range		100° ~ -100°	-42° ~ +120°
C-axis rotary range		360°	360°
Distance from spindle center to column	mm	600	800
Distance from spindle nose to table top	mm	100 ~ 560	100 ~ 580
TRUNNION TABLE			
Table size (X x Y)	mm	Ø210	560 x 365 (Ø350)
Table load capacity	kg	0° : 75	0° : 200
		0°~ 90° : 50	60°~ 90° : 100
Max. A / C axes speed	rpm	44.4 / 44.4	13.3 / 22.2
SPINDLE			
Spindle taper		BBT40	BBT40
Spindle motor (S1 / S6-40%)	kW	5.5 / 7.9 (7.5 / 11.5 Opt.)	10 / 14 (11 / 15 Opt.)
Spindle speed	rpm	12,000 (15,000 Opt.)	12,000 (15,000 Opt.)
FEED RATE			
X / Y axes rapid feed rate	m/min.	32	32
Z-axis rapids feed rate	m/min.	24	24
Cutting feed rate	m/min.	1~10	1-10
TOOL MAGAZINE			
Tool magazine capacity	T	24	30 (32 / 60 Opt.)
Max. tool diameter / adj. pocket empty	mm	Ø76 / Ø125	Ø76 / Ø125
Max. tool length	mm	250	300
Max. tool weight	kg	7	7
ACCURACY			
Positioning accuracy (ISO230-2)	mm	0.006	
Repeatability (ISO230-2)	mm	0.005	
GENERAL			
Control system		HEIDENHAIN TNC640 (FANUC O*i*-MF / SIEMENS 840D Opt.)	
Power requirement	kVA	25	45
Pneumatic pressure requirement	kg/cm^2	6	6
Machine weight	kg	4,500	7,400
Machine dimensions (L x W x H)	mm	2,200 x 2,415 x 3,050	3,100 x 2,185 x 3,235

Specications are subject to change without notice.

Standard Accessories

- Spindle air curtain
- Spindle oil cooler
- Centralized automatic lubricating system
- Roof enclosure splash guard
- Coolant equipment system (Pump & tank)
- Foundation bolt kit
- Electric cabin cooler
- Automatic power off system
- Chips flush coolant system
- Alarm light
- Air gun
- Tool box

Optional Accessories

- 15,000 rpm direct drive spindle
- Coolant through spindle (Form A)
- Caterpillar type chip conveyor and bucket
- Oil skimmer
- Automatic tool length measurement
- Automatic work-piece measurement