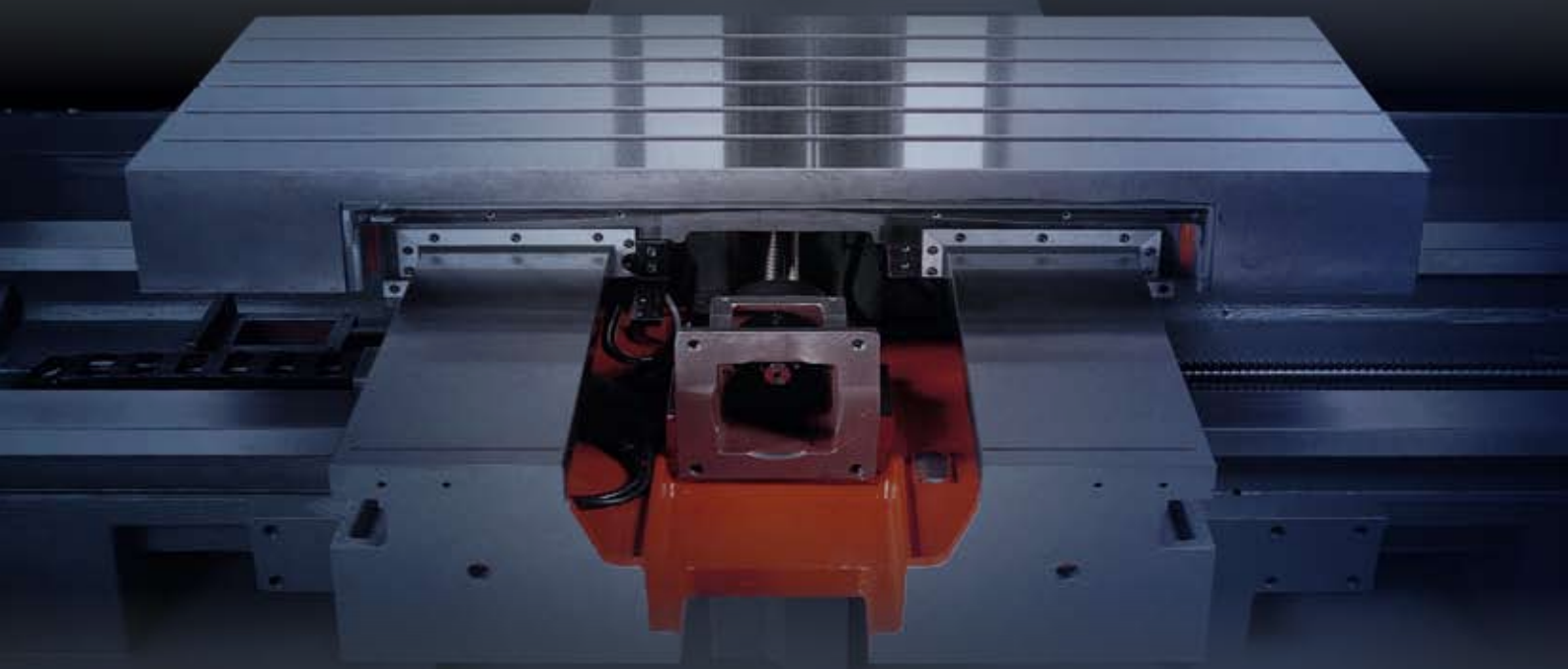


TV Series

Heavy Duty Vertical Machining Center



TV Series

Heavy Duty Vertical Machining Centers

The TV series is designed to fit the challenging machining requirements of superb machine rigidity and performance. This series is suitable for a wide range of applications like automotive, aerospace, electronics, and various dies and molds making.

The unique T-base structural design is one of the many innovations developed by YCM and is patent in Taiwan, China and the USA. Its overhang free table movement is supported by highly rigid MEEHANITE® castings to ensure the best dynamic leveling accuracy, machining rigidity and durability. The patent T-base structural design also offers the smallest machine foot print and the most efficient chip disposal system in its class.

To attain exceptional machining accuracy, the major components are reinforced through induction hardening process, precision ground and FEM analysis. All hardened and ground precision ballscrews are pre-tensioned and directly coupled to the servo motor to offer low backlash and optimal machining rigidity. The counter weight of Z-axis headstock is secured by guide bar to minimize machining vibration.

Patent No :

Taiwan

NO. 101029

U.S.A.

NO. 5263800

Mainland China

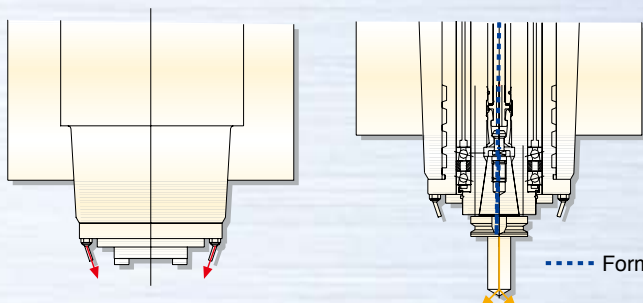
NO. ZL 93105466.4



The Most Eco-friendly and Floor-saving Machine Tool of Compact Splash Enclosure & Chips Disposal System

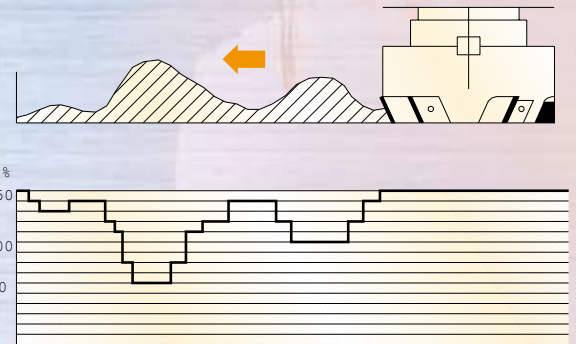
The long travel of X-axis lies on the top of the base, where the saddle moves along the full stroke; the cross Y-axis saddle supports the work table. This design virtually saves 20% ~ 30% of floor space.

The T-base rigid structure has full stroke support and do not have overhang problem guarantees the most dynamic leveling accuracy.



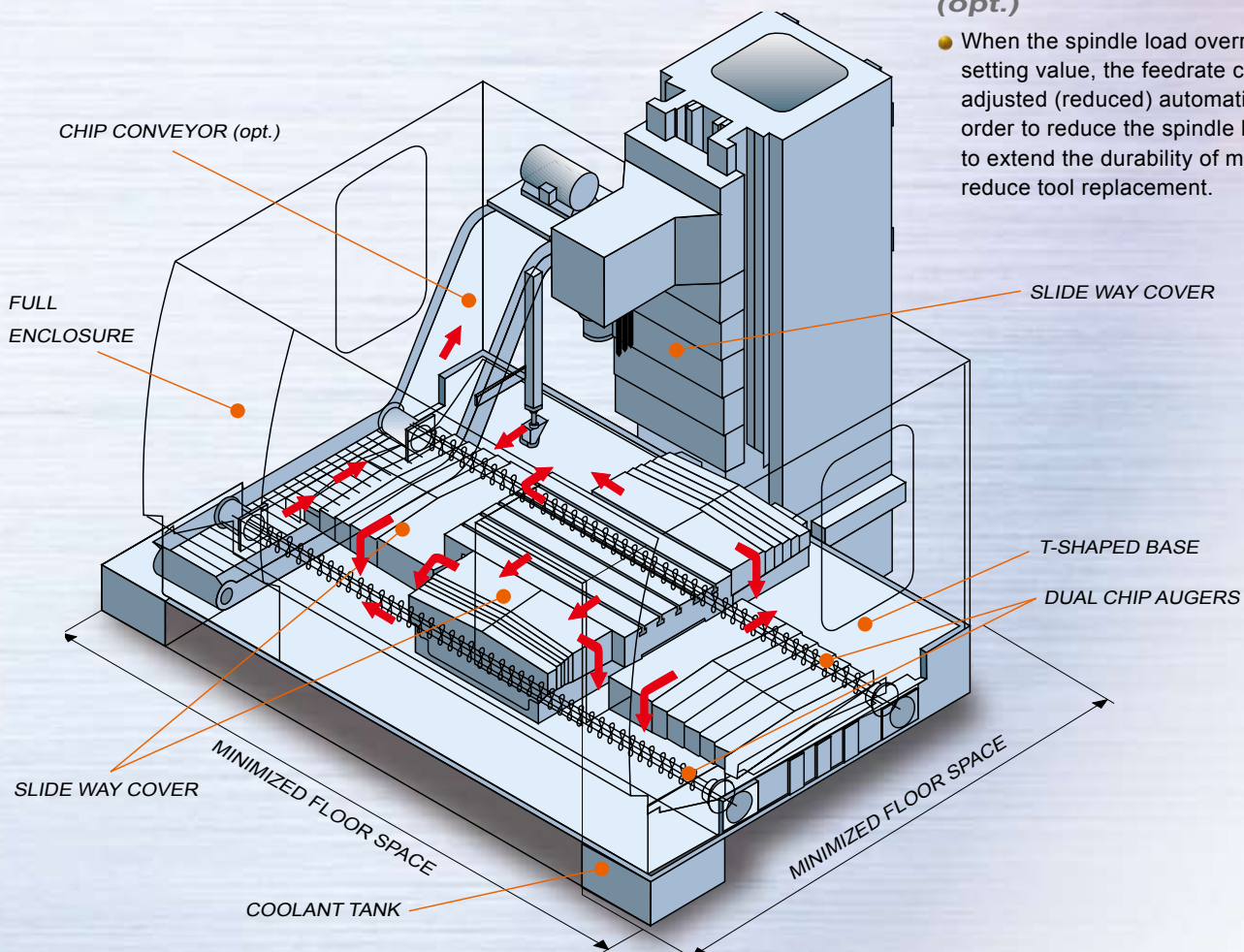
Pressure of coolant:
1.2kg/cm² 17.07psi;
4kg/cm² 56.89psi (opt.)

Coolant through spindle (opt.) Din69871 form a;
pressure: 10kg/cm² 142.23psi ;
20kg/cm² 284.46psi



Integration of Applicable Machining Function-A.F.C. (opt.)

- When the spindle load overruns the setting value, the feedrate can be adjusted (reduced) automatically in order to reduce the spindle load, so as to extend the durability of machine and reduce tool replacement.



TV Series

High Speed, High Precision Spindle Modules

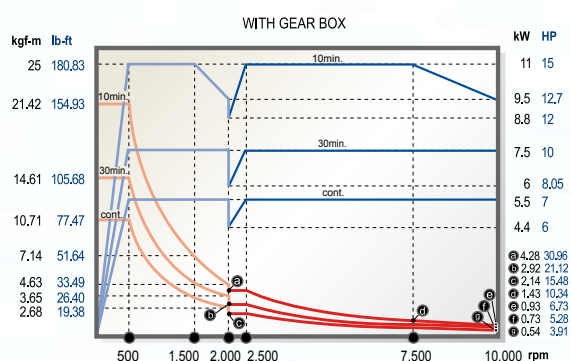
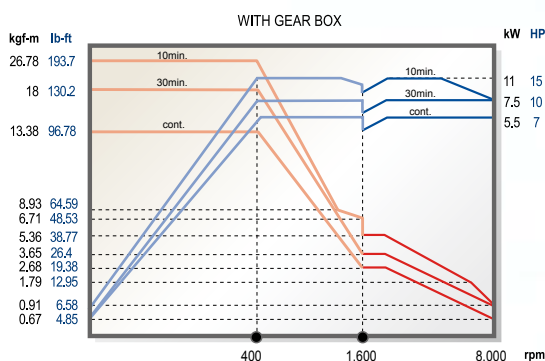
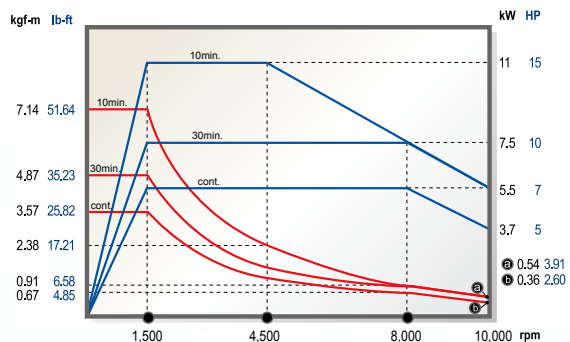
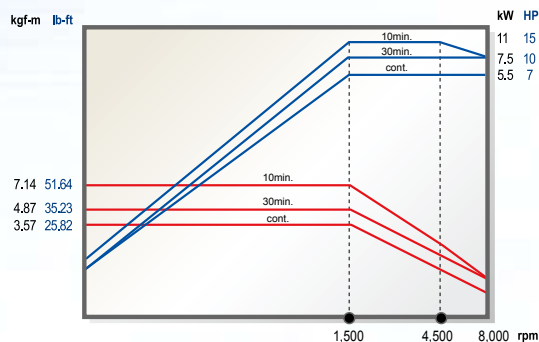
Various spindle modules of high speed and high power output suit different kinds of machining requirements.

TV146A

- The spindle is deployed with precise angular contact ball bearings and can reach up to 8,000rpm with maximum torque at 26.78kgf-m 193.70lb-ft.
- Powerful AC servo spindle motor is the standard equipment. The high-low auto-shift gear transmission box is an optional accessory for higher torque machining requirements.
- Powerful grip timing belts is used to prevent skid.
- 10,000rpm spindle with precise ceramic ball bearings can be selected for the requirements of higher speed. (opt.)



POWER		TORQUE	
Low Speed	Low Speed	Low Speed	Low Speed
High Speed	High Speed	High Speed	High Speed

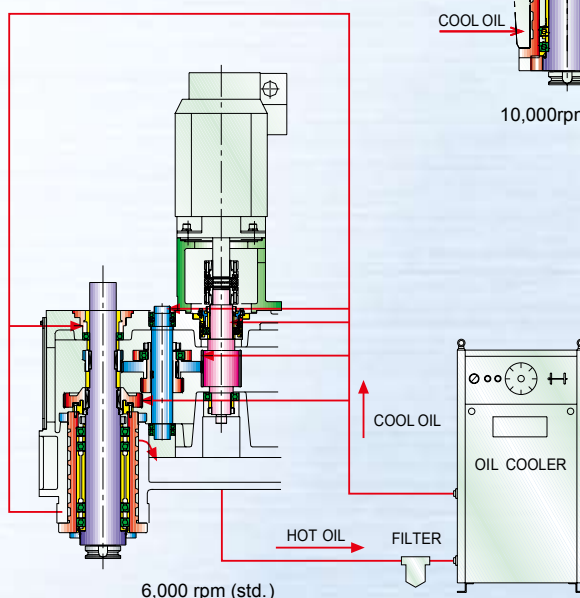
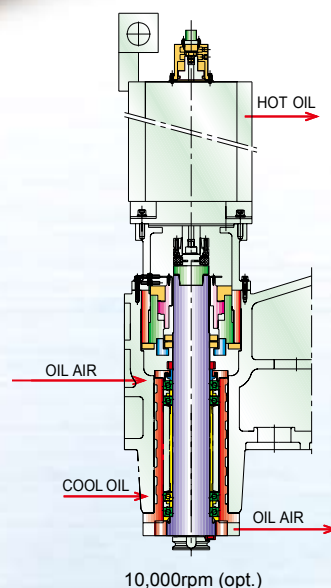
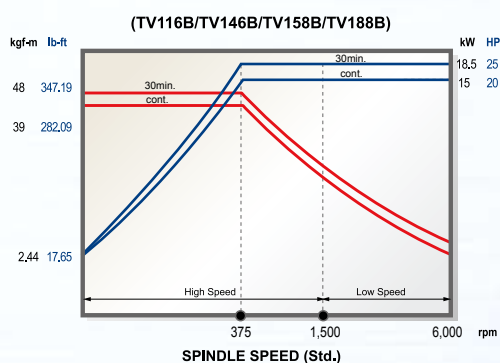
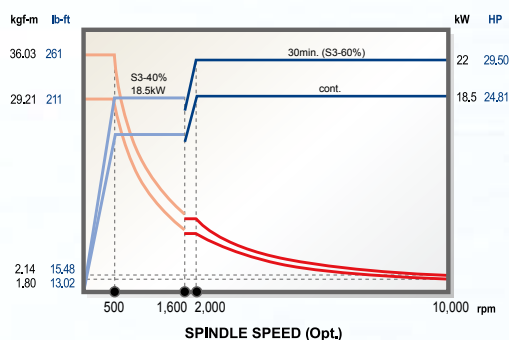
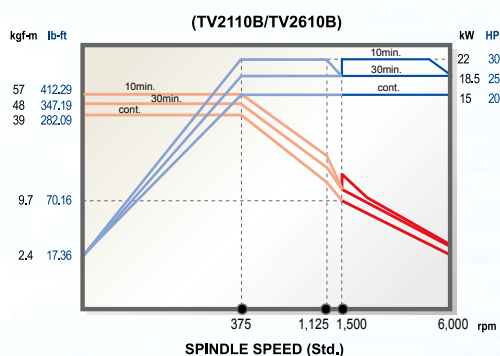


TV116B/TV146B/TV158B/TV188B/TV2110B/TV2610B

- Deploy precision angular contact ceramic ball bearings of extra rigidity both axial- and radial-wises for very heavy cutting requirements.
- Standard gearhead spindle of maximum of 6,000rpm high speed with the max. of 18.5kW **25HP** (30min.) power output and 48kg-m **347lb-ft** torque.
- The max. spindle power output at 22kW **30HP** (10min.) and torque at 57kgf-m **412 lb-ft** with metal removal capacity at 600cc/min. (TV2110B/TV2610B)
- The 10,000rpm spindle is deployed with IDD spindle design and oil-air lubrication to lower the deformation caused by heat, strengthen the accuracy and extend the life of the spindle. It can be installed with IDD oil-air lubrication spindle of max. 10,000rpm for max. of 22kW **30HP** power output with 36kgf-m **260 lb-ft** torque of auto-coil-switch speed transmission.
- The quill type spindle housing is easily facilitated with cooling system to assure the best temperature control of the spindle head, and for the best machining results.



POWER		TORQUE	
Low Speed	Low Speed	Low Speed	Low Speed
High Speed	High Speed	High Speed	High Speed



TV Series

High Efficiency, High Performance, Fully Automated Production Equipment

Fast & Reliable ATC System

- The 20T umbrella type armless ATC system of 40# spindle machines is compact, reliable and easy to maintain.
- The arm type ATC system is driven by roller gear cam to increase the work efficiency. Number of tool posts in magazine can be selected for 24T/30T(40#), or 32T(50#).



32T (50#)



24T / 30T (40#)

Humanized Operation Panel

- The swivel operation panel of appropriate height and clear modular switches can be operated easily.
- Clearly display the signals and alarm messages.
- Detachable MPG handwheel is installed for operational convenience.

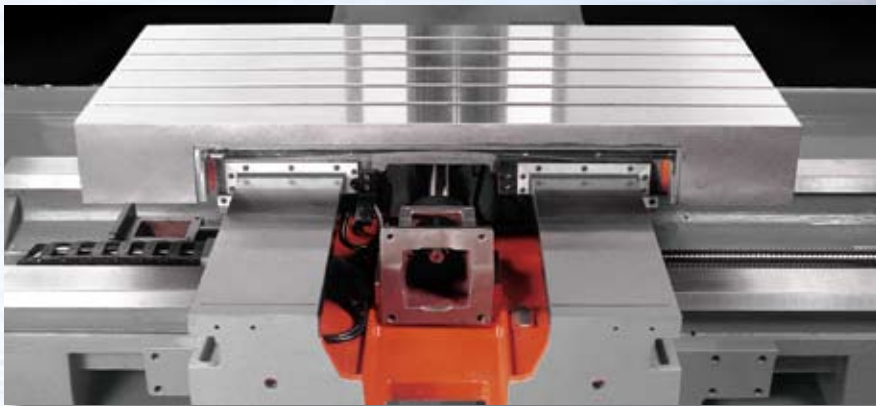


CUTTING-CONDITION LIST

	TV116B	TV146B	TV158B	TV188B	TV2110B	TV2610B
Face milling						
Workpiece material	S45C	S45C	S45C	S45C	S45C	S45C
Tool-size × cutting-edges	ø160 × 10T	ø160 × 10T	ø160 × 10T	ø160 × 10T	ø160 × 10T	ø160 × 10T
Cutting-width × depth	mm × mm	mm × mm	mm × mm	mm × mm	mm × mm	mm × mm
Spindle speed	rpm	rpm	rpm	rpm	rpm	rpm
Feed	mm/min.	mm/min.	mm/min.	mm/min.	mm/min.	mm/min.
Cutting efficiency	cm ³ /min.	cm ³ /min.	cm ³ /min.	cm ³ /min.	cm ³ /min.	cm ³ /min.
End milling						
Workpiece material	S45C	S45C	S45C	S45C	S45C	S45C
Tool-size × cutting-edges	ø63 × 4T	ø63 × 4T	ø63 × 4T	ø63 × 4T	ø63 × 4T	ø63 × 4T
Cutting-width × depth	mm × mm	mm × mm	mm × mm	mm × mm	mm × mm	mm × mm
Spindle speed	rpm	rpm	rpm	rpm	rpm	rpm
Feed	mm/min.	mm/min.	mm/min.	mm/min.	mm/min.	mm/min.
Cutting efficiency	cm ³ /min.	cm ³ /min.	cm ³ /min.	cm ³ /min.	cm ³ /min.	cm ³ /min.

The Best Force Flow T-base Design

- The long travel of X-axis lies on the top of the base, where the saddle moves along the full stroke; the cross Y-axis saddle supports the work table.
- The T-base rigid structure has full stroke support and do not have overhang problem guarantees the most dynamic leveling accuracy.



Reliable Automatic Pallet Changer System

- Reliable APC system with the unique design of shuttle type mechanism successfully shortens the machining time thus increases efficiency.

		TV116S
Pallet Size	mm <i>inch</i>	1,200 x 560 47.24 x 22.05
Table Load Capacity	kg <i>lb</i>	600 1,323
Table Surface to Floor	mm <i>inch</i>	965 37.99



● APC



● 9mm Depth Face Milling (50#)



● Optimal Chip Removal (50#) Face Milling



● Optimal Chip Removal (50#) End Milling

TV Series 116B

High Rigidity Axial Movement

- All axes are equipped with hardened and precision ground integrated square guideway with durable Turcite-B lubrication coating.
- Sophisticated scraper work guarantees the best contact and perfect surface of the components to assure flawless accuracy.
- Sufficient support areas of all guideways give the best damping capacity and gain the best cutting rigidity.
- All precise ballscrews are pre-tensioned and directly coupled with powerful servo motors to reduce backlash and ensure the best accuracy.
- The counter weight of Z-axis headstock is secured by guide bar to minimize machining vibration.



TV116B ACCURACY

Tolerances	Standard	ISO 10791-4	JIS B 6338 (1985)
		Full Length	—
Axial Travel			
Positioning	A	0.014mm (0.00055")	0.004/300mm (0.00016"/11.81")
Repeatability	R	0.010mm (0.00039")	±0.003mm (±0.00012")

VDI/DGQ3441 is equivalent to A of ISO10791-4, and PS is equivalent to R.
All values shown above are measured for machine in good air conditioned environments.



TV116B Structure

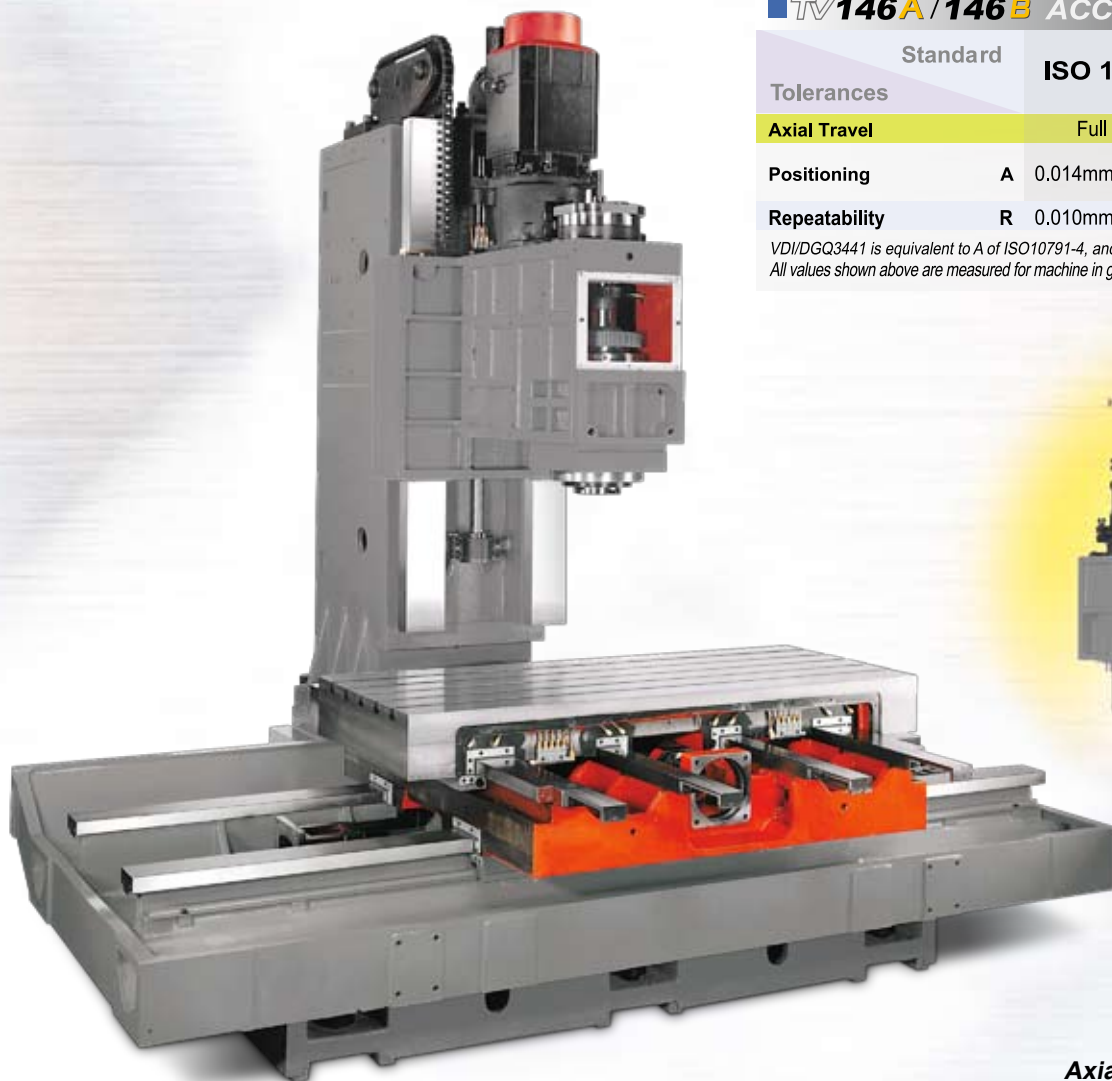
Axial Rapid Feedrate

X	16m/min. 630ipm
Y	16m/min. 630ipm
Z	16m/min. 630ipm

TV Series 146A/146B

High Rigidity Axial Movement

- All axes are equipped with hardened and precision ground integrated square guideway with durable Turcite-B lubrication coating.
- Sophisticated scraper work iguarantees the best contact and perfect surface of the components to assure flawless accuracy.
- Sufficient support areas of all guideways give the best damping capacity and gain the best cutting rigidity.
- All precise ballscrews are pre-tensioned and directly coupled with powerful servo motors to reduce backlash and ensure the best accuracy.
- The counter weight of Z-axis headstock is secured by guide bar to minimize machining vibration.
- The Y-axis is equipped with 4 guideways to gain the best support and forceflow.



TV146B Y-axis 4 Guideways Design

TV146A/146B ACCURACY

Standard		ISO 10791-4	JIS B 6338 (1985)
Tolerances			
Axial Travel		Full Length	—
Positioning	A	0.014mm (0.00055")	0.004/300mm (0.00016"/11.81")
Repeatability	R	0.010mm (0.00039")	±0.003mm (±0.00012")

VDI/DGQ3441 is equivalent to A of ISO10791-4, and PS is equivalent to R.
All values shown above are measured for machine in good air conditioned environments.



TV146A Headstock

Axial Rapid Feedrate

X	16m/min. 630ipm
Y	16m/min. 630ipm
Z	16m/min. 630ipm



TV Series 158B/188B

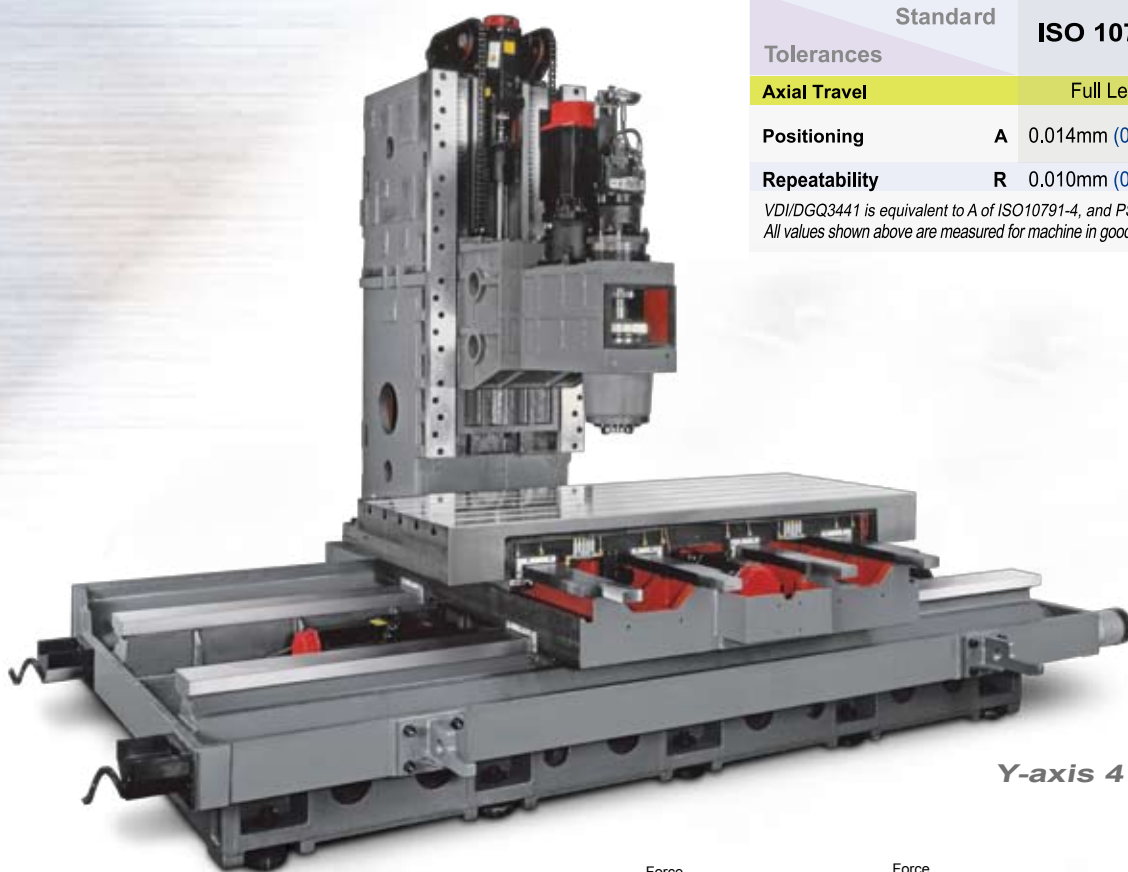
High Rigidity Axial Movement

- All axes are equipped with hardened and precision ground integrated square guideway with durable Turcite-B lubrication coating.
- Sophisticated scraper work guarantees the best contact and perfect surface of the components to assure flawless accuracy.
- Sufficient support areas of all guideways give the best damping capacity and gain the best cutting rigidity.
- All precise ballscrews are pre-tensioned and directly coupled with powerful servo motors to reduce backlash and ensure the best accuracy.
- Inner-rail design on Z-axis ensures smooth movement of the headstock during heavy cutting performance. And the counter weight of Z-axis headstock is secured by guide bar to minimize machining vibration.
- The Y-axis is equipped with 4 guideways to gain the best support and forceflow.

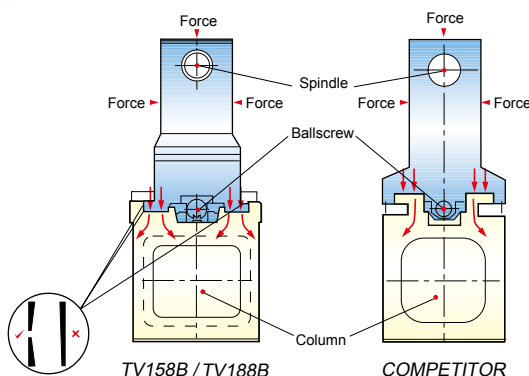
TV158B / 188B ACCURACY

	Standard	ISO 10791-4	JIS B 6338 (1985)
Tolerances			
Axial Travel		Full Length	—
Positioning	A	0.014mm (0.00055")	0.004/300mm (0.00016"/11.81")
Repeatability	R	0.010mm (0.00039")	±0.003mm (±0.00012")

VDI/DGQ3441 is equivalent to A of ISO10791-4, and PS is equivalent to R.
All values shown above are measured for machine in good air conditioned environments.



Y-axis 4 Guideways



TV158B / TV188B

COMPETITOR

Axial Rapid Feedrate

X	15m/min. 591ipm
Y	15m/min. 591ipm
Z	12m/min. 472ipm



TV Series 2110B/2610B

High Rigidity Axial Movement

- X & Y-axis are designed with ultra heavy load IKO roller linear guideways for the max. 7,000kg **15,432 lb** work load and to ensure the smoothest axial movements.
- Y-axis is equipped with 4 guideways to gain the best support and to reinforce the axial movement.
- Sufficient support areas of all guideways give the best damping capacity and gain the best cutting rigidity.
- All precise ballscrews are pre-tensioned and directly coupled with powerful servo motors to reduce backlash and ensure the best accuracy.
- Inner-rail design on Z-axis ensures smooth movement of the headstock during heavy cutting performance. And the counter weight of Z-axis headstock is secured by guide bar to minimize machining vibration.

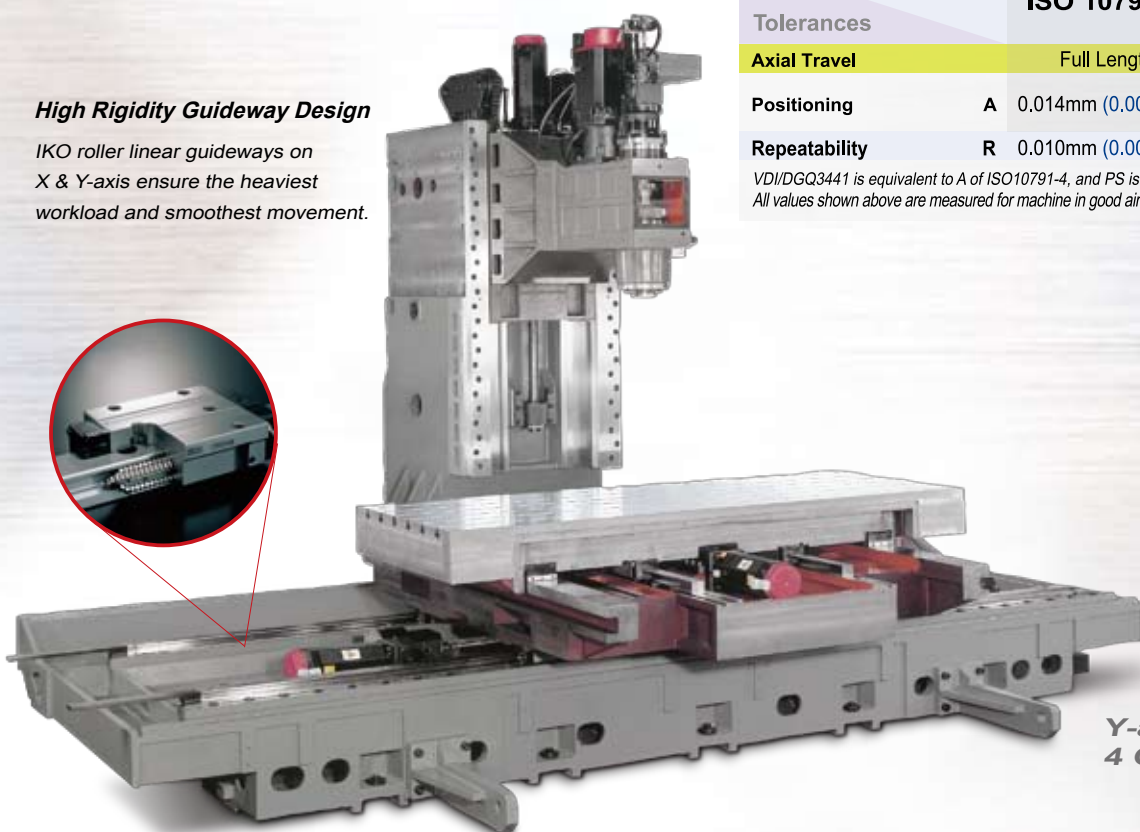
TV2110B/2610B ACCURACY

	Standard	ISO 10791-4	JIS B 6338 (1985)
Tolerances			
Axial Travel		Full Length	—
Positioning	A	0.014mm (0.00055")	0.004/300mm (0.00016"/11.81")
Repeatability	R	0.010mm (0.00039")	±0.003mm (±0.00012")

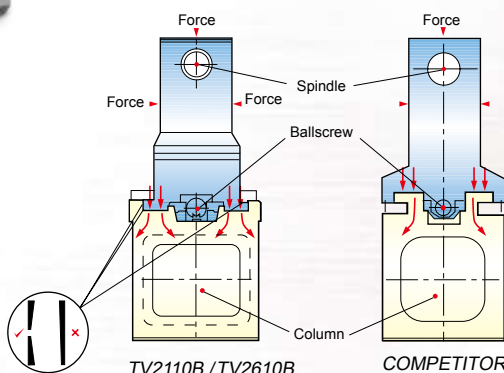
VDI/DGQ3441 is equivalent to A of ISO10791-4, and PS is equivalent to R.
All values shown above are measured for machine in good air conditioned environments.

High Rigidity Guideway Design

IKO roller linear guideways on X & Y-axis ensure the heaviest workload and smoothest movement.



Y-axis Complex 4 Guideways Design



Axial Rapid Feedrate

X	12m/min. 472ipm
Y	12m/min. 472ipm
Z	12m/min. 472ipm



TV Series 116B

DIMENSIONS

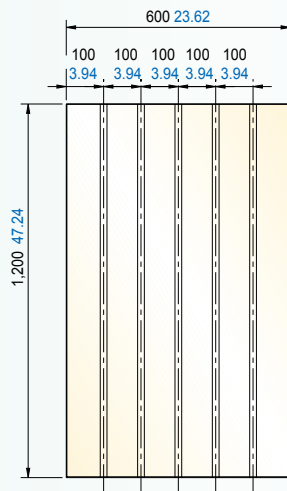
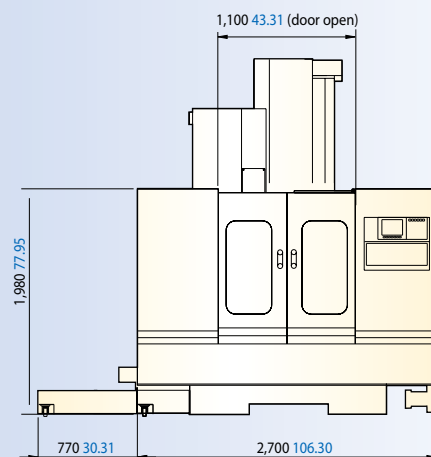
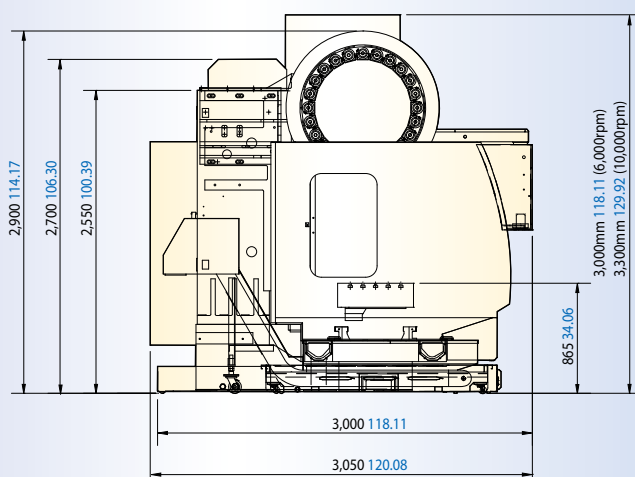
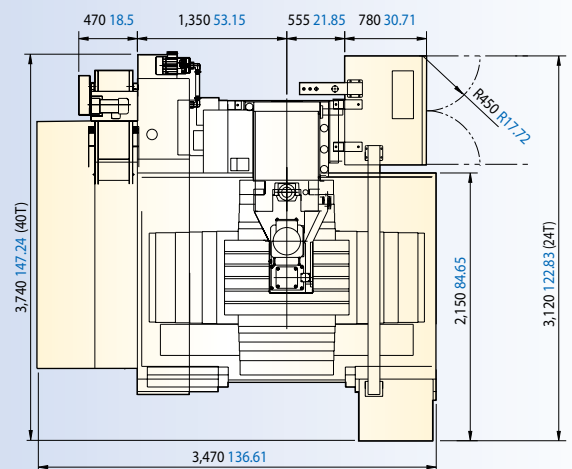
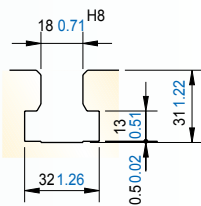


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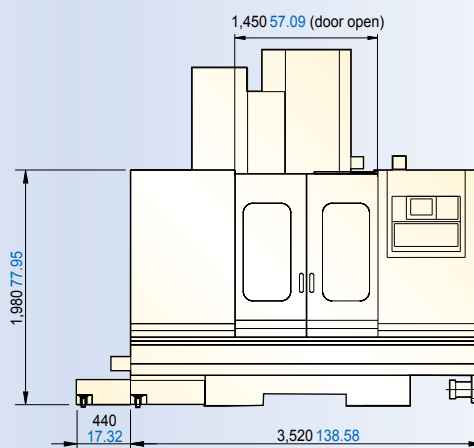
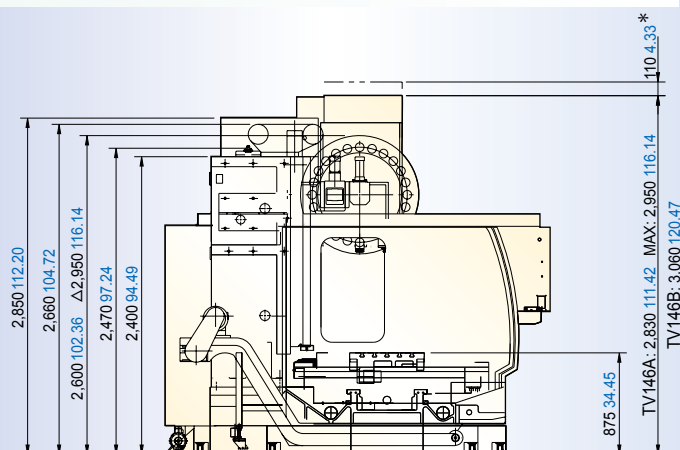
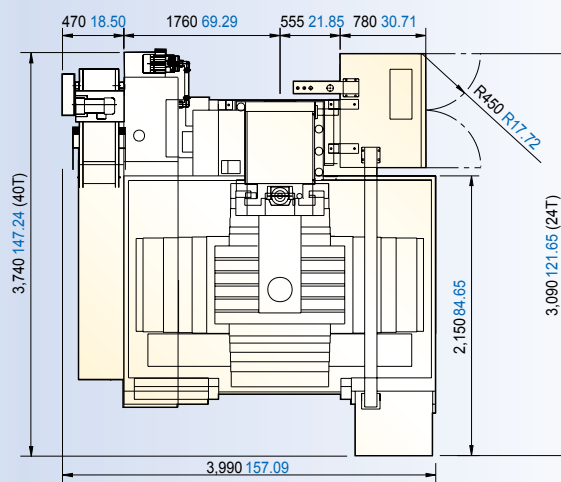
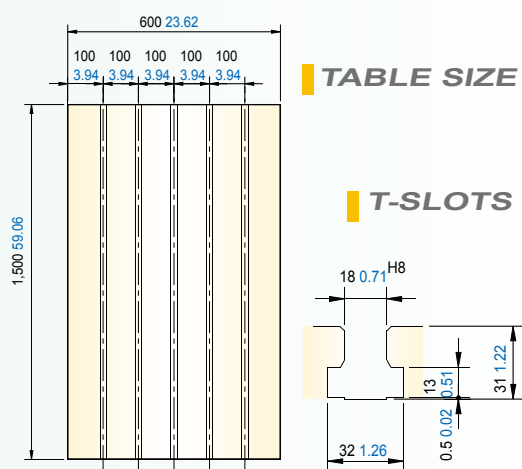
T-SLOTS



Unit : mm inch

TV Series 146A/146B

DIMENSIONS



* 110mm 34.33" : ATC Stroke for 20T (40#)

Δ2950mm 116.14" : ATC Magazine Height of TV146B/24T

Unit : mm inch

TV Series 158B/188B

DIMENSIONS

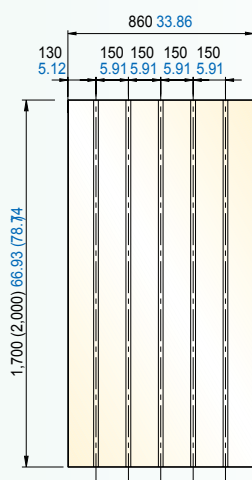
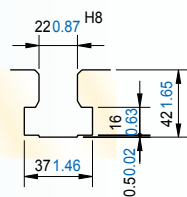
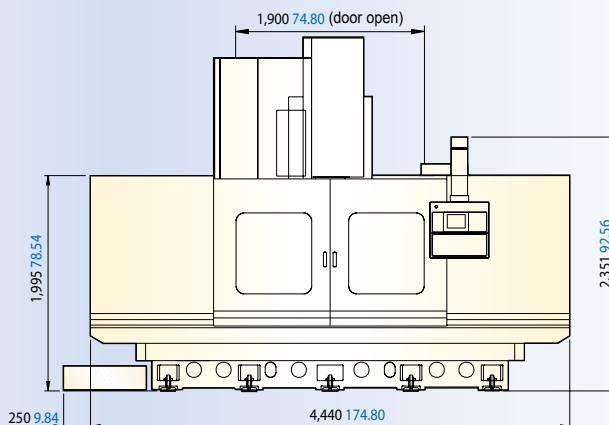
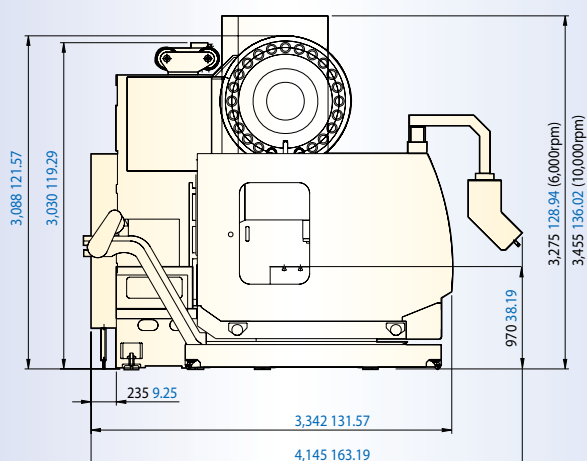
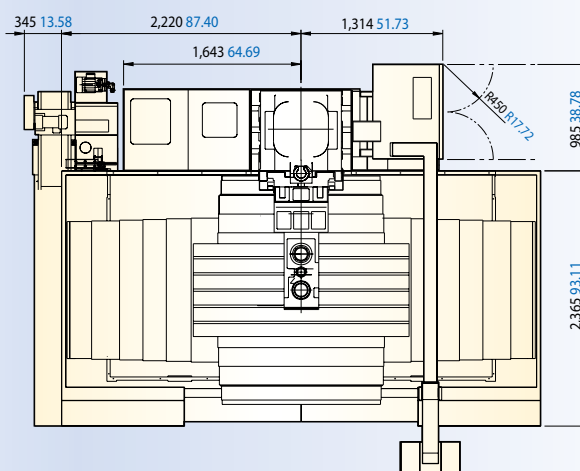


TABLE SIZE

T-SLOTS



() For TV188B



TV Series 2110B/2610B

DIMENSIONS

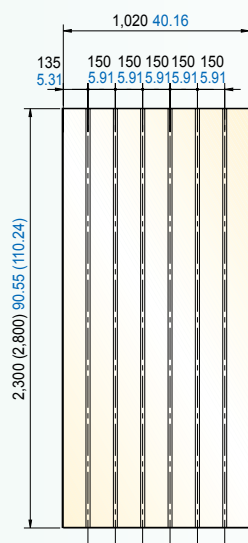
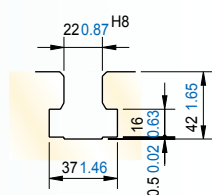
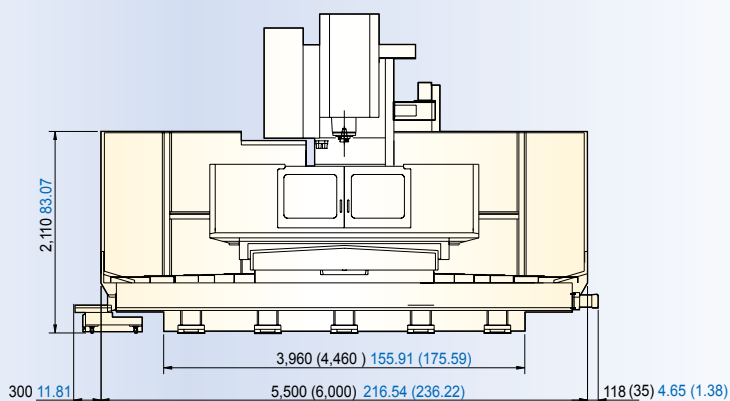
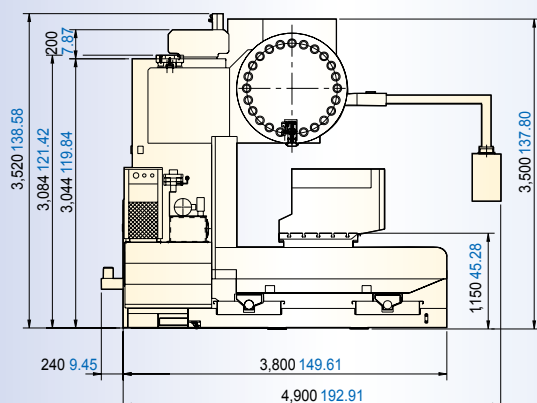
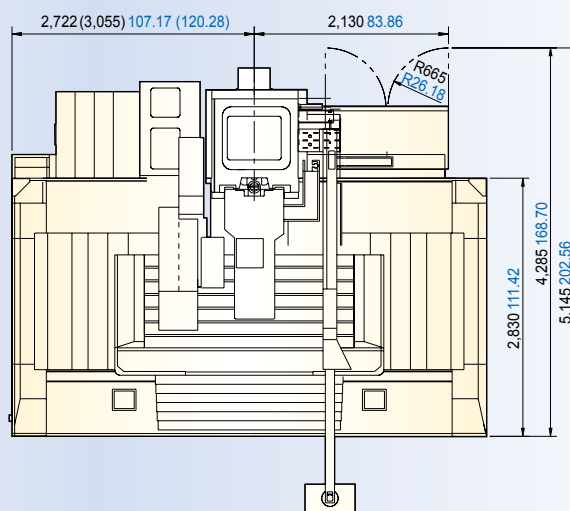


TABLE SIZE

T-SLOTS



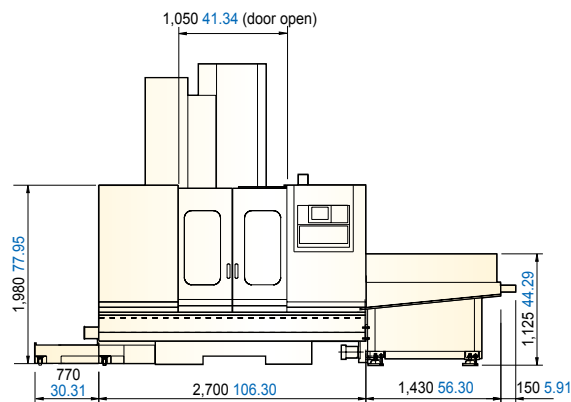
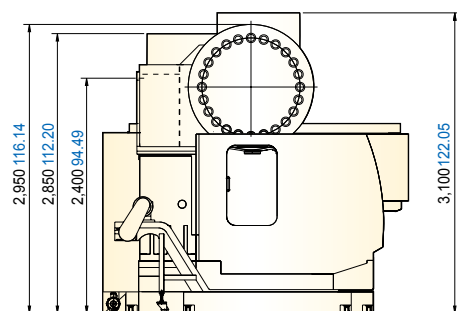
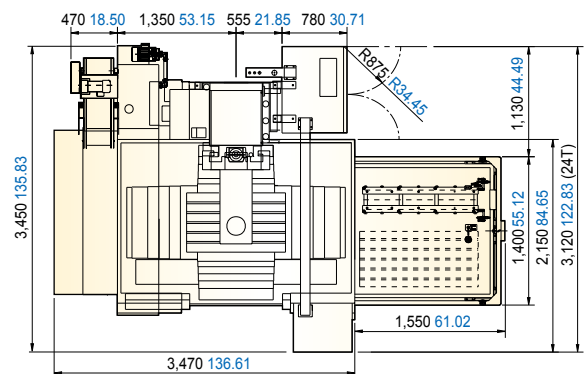
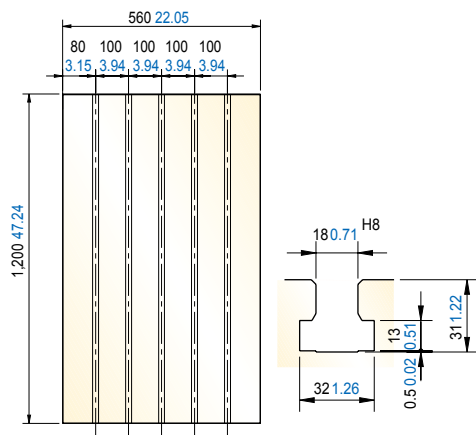
() For TV2610B



Unit : mm inch

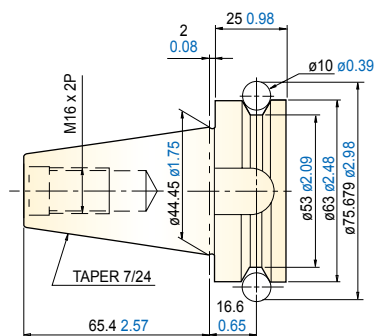
TV Series 116B+APC

DIMENSIONS

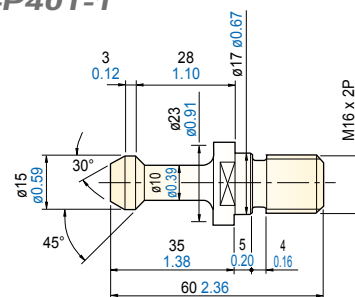


PULL STUD AND TOOL SHANK

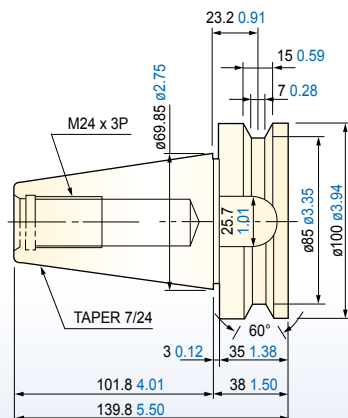
BT40



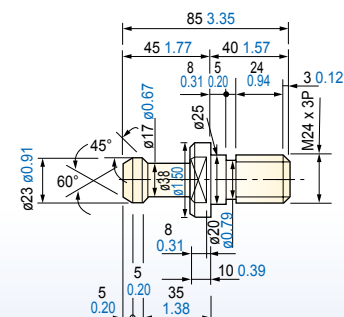
MAS-P40T-1



BT50



MAS-P50T-1



TV2610B

TRAVEL

TABLE**FEEDRATE****ATC**

GENERAL

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms etc. to improve the performance of the machine without notice. All the specifications shown above are just for reference.

●: Standard ○: Option —: None

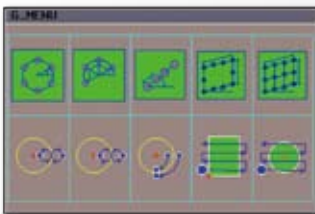
MODEL		ITEMS													
ITEMS	146A	116B	146B	158B	188B	2110B	2610B	MODEL	146A	116B	146B	158B	188B	2110B	2610B
Tool Kit	●	●	●	●	●	●	●	4th Axis Rotary Table	○	○	○	○	○	○	○
Work Lamp	●	●	●	●	●	●	●	Leveling Blocks and Bolts	○	●	●	●	●	●	●
Pilot Lamp	●	●	●	●	●	●	●	Guideway Cover (X,Y,Z)	●	●	●	●	●	●	●
Optical Scale	○	○	○	○	○	○	○	Rigid Tapping	●	●	●	●	●	●	●
Gear Box	○	●	●	●	●	●	●	Hydraulic System	○	●	●	●	●	●	●
Foundation Bolts	○	●	●	●	●	●	●	Chip Auger	●	●	●	●	●	●	●
Coolant Equipment System	●	●	●	●	●	●	●	A.F.C. Adaptive Feedrate Control	○	○	○	○	○	○	○
Oil Skimmer	○	○	○	●	●	●	●	Mechanical, Electrical & Operating Manuals	●	●	●	●	●	●	●
Splash Guard	—	—	—	—	—	●	●	Heat Exchanger for Electrical Cabinet	●	●	●	●	●	●	●
Coolant Gun	●	●	●	●	●	●	●	A/C. Cooler for Electrical Cabinet	○	○	○	○	○	○	○
Spindle Air Blast	●	●	●	●	●	●	●	Chip Conveyor	○	○	○	○	○	○	○
Cutting Air Blast	●	●	●	●	●	●	●	Circular Coolant Nozzle	●	○	○	●	●	●	●
Oil Hole Holder Function	○	○	○	○	○	○	○	Heavy Duty Coolant Pump	○	○	○	○	○	○	○
Automatic Power Off Device	○	○	○	○	○	○	○	Full Chip Enclosure	○	○	○	○	○	○	○
Oil-mist Coolant System	○	○	○	○	○	○	○	Workpiece Measurement System (RENISHAW OMP60)	○	○	○	○	○	○	○
Chip Enclosure	●	●	●	●	●	○	○	Auto Tool Length Measurement System (METROL T24E-04-08)	○	○	○	○	○	○	○
Automatic Pallet Changer (APC)	—	○	—	—	—	—	—	CNC Control: YEONG CHIN FANUC MXP-200FB	●	●	●	●	●	●	●
Central Lubrication System	●	●	●	●	●	●	●								
Spindle Cooling System	○	●	●	●	●	●	●								
Coolant Through Spindle System	○	○	○	○	○	○	○								



MXP-200 FB/FC

YCM CONTROL
by **FANUC**

- High performance AC digital servo & spindle drives
- High resolution 10.4" color LCD monitor with dynamic graphic display
- Manual guide i conversational function greatly reduces programming and setup time
- Built-in AICC II and high speed JERK function
- Auto switching on/off high speed high accuracy machining control function
- High speed rigid tapping, helical interpolation, custom macro B, and tool path graphics
- Combined uses of many high performance microprocessors, high speed memory and the adoption of Multi-CPU system for super high speed control processing
- Large program capacity with 1,280 meters of memory
- Program management by program folders and file names
- Power failure module
- Full alphanumeric keyboard allows easy program editing
- PCMCIA slot for easy file transfer and memory expansion
- Dynamic display language switching function
- RS-232C interface ready for fast program transfer
- Powerful servo motors with super precision absolute positioning encoders (opt.)
- Editing and operation of a memory card and data server (opt.)
- FANUC program transfer tool (opt.)
- Tool management functions (opt.)
- Learning control for parts cutting and rigid tapping (opt.)



■ G-menu Function

User-friendly G-menu function provides multiple machining cycles that greatly simplifies programming steps



■ Calculator Function

Convenient calculator function provides fast calculation and setting of workpiece offsets



■ Easy Shop-floor Programming Manual Guide i

Easy to use conversational software offers convenience of part programming right on the shop-floor with 3D graphical display and full simulation function



■ Counter Function

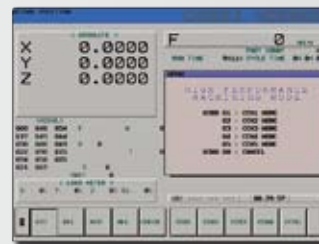
Allows user to easily keep track on number of workpieces with:

- Main Counter
- Periodical Counter
- Daily Counter
- Over Cycle Alarm



■ Intelligent Tool Data Management

Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine



■ High Speed Machining Mode: M400

Combined with artificial intelligence, M400 provides users more convenient and easier ways of operation and achieves fast cycle time for the best machining result.



■ Pop-up Alarm Display

Detailed troubleshooting procedures will be automatically displayed when machine alarm occurs that allows users to restore machine status and minimize down time



■ Intelligent Maintenance Reminder

Pre-set maintenance schedules are programmed to remind operators to inspect periodically prolonging machine life



■ Automatic Tool Length Measurement

Pre-set macros and graphical procedure are provided for automatic tool length measurement function



■ Manual Tool Length Measurement

Easy setup of tool length measurement provides convenient setting of tool offsets data from one tool to another



i OPERATION *Plus*

Software enhancement exclusively from YCM

Multi-function Display

Easily select multiple windows from the following list of display for your monitoring needs.

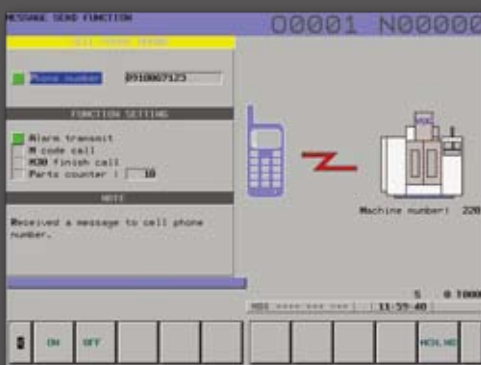
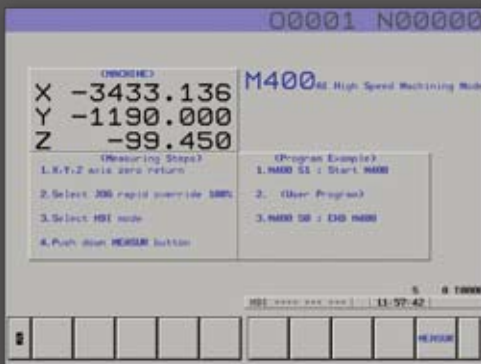
- G-code Status
- M-code Status
- Spindle Status
- Controller Running Hours
- Feedrate
- Tool Data
- Work Coordination
- Spindle Load
- Parts Count
- Machining Hours
- Date and Time
- Function Display

High Performance Machining Mode: M300

High performance mode with 5 settings allows users to select for the best machining results.

Wireless Message Notification (opt.)

Integrating GSM communication and CNC technology, YCM developed the WMN system for wireless notification of machine and work status report.



VMC

Vertical Machining Center

FP Series High Precision High Performance Die Mold Vertical Machining Center
FP55A, FP66A, FP100A

FV Series High Speed High Performance Vertical Machining Center / High Speed High Performance Drilling & Tapping Center
FV56T, FV56A, FV85A, FV102A, FV125A / FV50T

XV Series High Performance Vertical Machining Center
XV560A, XV1020A, XV1250A

EV Series High Efficiency Vertical Machining Center
EV1020A

TV Series Heavy Duty Vertical Machining Center
TV116B, TV146A/B, TV158B, TV188B, TV2110B, TV2610B

MV Series High Performance High Rigidity Vertical Machining Center
MV66A, MV76A, MV86A, MV106A

WV Series Ultra Wide High Performance Vertical Machining Center
WV108A/B

FX Series 5-axis Vertical Machining Center
FX380A

NSV Series Ultra High Performance Vertical Machining Center
NSV66A, NSV85A, NSV102A, NSV156A

NDV Series High Precision Die Mold Vertical Machining Center
NDV66A, NDV85A, NDV102A

DCV Series Advanced Double Column Vertical Machining Center
DCV2012A/B, DCV3016B, DCV4016B, DCV3021B, DCV4021B, DCV3025B, DCV4025B, DCV4035B, DCV4035B-5AX

TCV Series High Performance Traveling Column Vertical Machining Center
TCV2000A, TCV3000A, TCV3000A-5AF

HMC

Horizontal Machining Center

H Series High Production Horizontal Machining Center
H500A/B, H630B, H800B, H2612B

CNC LATHES

CNC Turning Center

NT Series High Performance Mill-turn Multi-tasking Center
NT-2000Y/SY, NT-2500Y/SY

GT Series High Performance Geo Turning Center
GT-200A/B/MA, GT-250A/B/MA, GT-300A/B/MA/LB, GT-380A/B/LA/LB

TC Series High Performance High Precision CNC Lathe
TC-16A/B/LA/LB, TC-26, TC-26L, TC-36, TC-36W, TC-46

Integrated Operation Control System **iOPERATION**

Spindle Thermal Compensation System **STCPLUS**

Remote Monitoring System **iDirect**

Automation Solutions

INTEGRATION
AND SOLUTIONS

YCM®

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