

**TV**  
Series

*Heavy Duty Vertical Machining Center*



**YCM**<sup>®</sup>

# TV Series

## Heavy Duty Vertical Machining Centers

**The TV series is** designed for superb machine rigidity and performance. This series is suitable for a wide range of applications like automotive, aerospace and electronics.

**The unique** T-base structural design has been awarded a patent from Taiwan, China and the U.S.A. Its overhang free table movement is supported by highly rigid MEEHANITE® castings to ensure the best dynamic leveling accuracy, machining rigidity and durability.

The counterweight of Z-axis headstock is secured by guide bar to minimize machining vibration. Various spindle modules of high speed and high power output suit different kinds of machining requirements. Fast and reliable ATC system, efficient chip disposal system, humanized operation panel, and some models can work with APC for shortening the machining time thus increases efficiency. This TV series is favored and recommended by all industries.

Patent No :

Taiwan NO. 101029

U.S.A. NO. 5263800

Mainland China NO. ZL 93105466.4

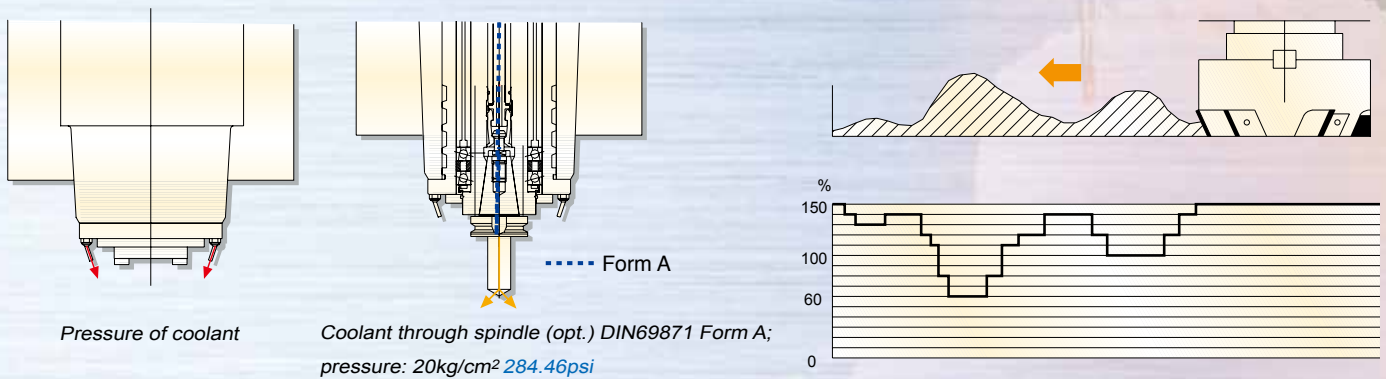


The appearance of the machines will be diverse due to different model and selectivity of controllers.

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

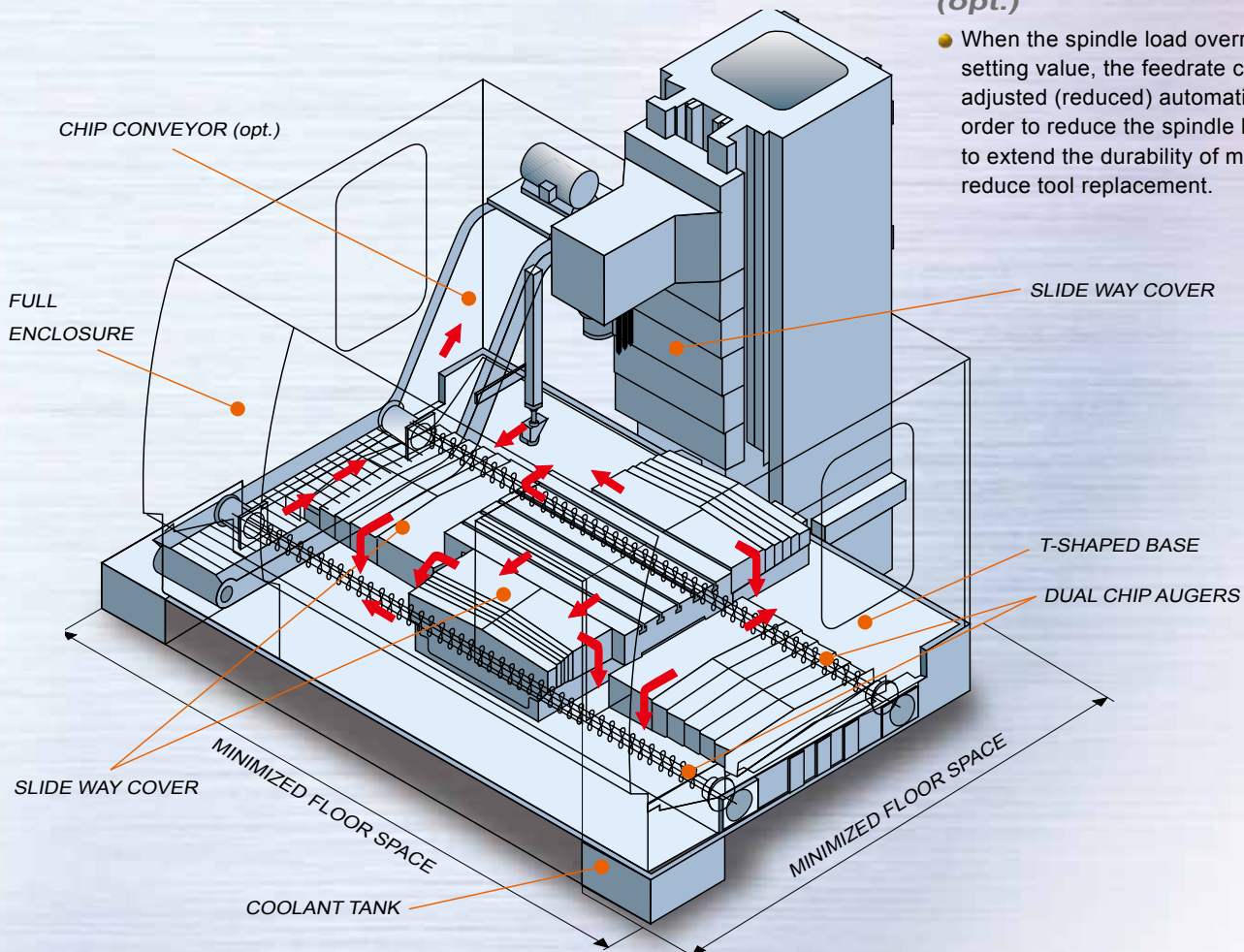
The long travel of X-axis lies on the top of the base, where the saddle moves along the full stroke; the cross Y-axis saddle supports the work table. This design virtually saves 20% ~ 30% of floor space.

The T-base rigid structure full stroke support guarantees the most dynamic accuracy.



## 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.

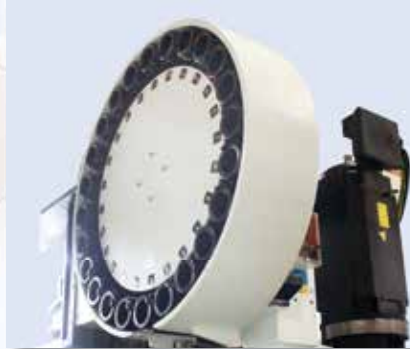


# TV Series

## High Efficiency, High Performance, Fully Automated Production Equipment

### Fast & Reliable ATC System

- 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/32T/40T.



24T



32T

### Reliable Automatic Pallet Changer System

- Reliable APC system with the unique design of shuttle type mechanism successfully shortens the machining time thus increases efficiency.
- Pallet change time: 25 sec.

		<b>TV116B+APC</b>
Pallet Size	mm inch	1,200 x 560 47.24 x 22.05
Table Load Capacity	kg lb	600 1,323
Table Surface to Floor	mm inch	965 37.99



● APC



● 9mm Depth Face Milling (50#)



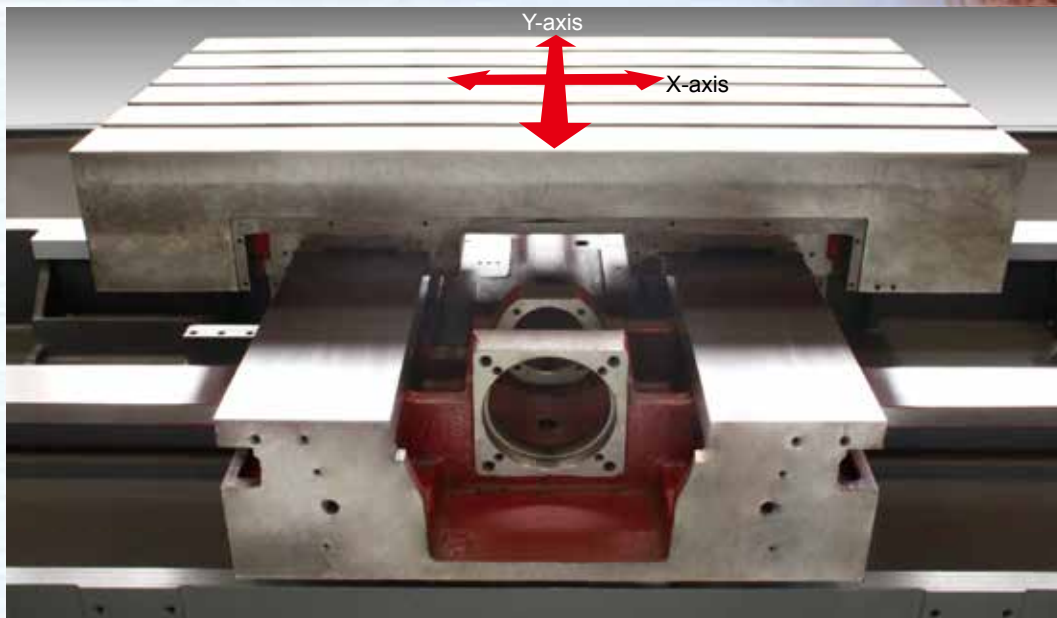
● Optimal Chip Removal (50#) Face Milling



● Optimal Chip Removal (50#) End Milling

### **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.



### **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.



# TV Series

## TV116B/TV146B/TV158B/TV188B/TV2110B/TV2610B

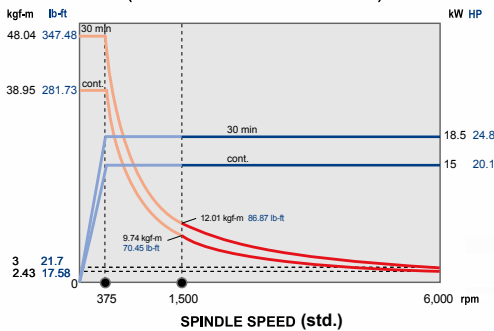
- Standard gearhead spindle of maximum of 6,000rpm high-speed with the maximum of 15kW/18.5kW 20HP/24.8HP power output and 48kg-m 347.19lb-ft torque.
- The maximum spindle power output at 15kW/18.5kW /22kW 20HP/24.8HP/29.5HP and torque at 57kgf-m 412 lb-ft with metal removal capacity at 600cc/min. (TV2110B/TV2610B).
- Spindle speed of up to 10,000rpm with IDD (Isolated Direct Drive) design, coupled with oil lubrication that can lower heat deviation, improve spindle accuracy and extend bearing life. Spindle power 18.5kW / 22kW 24.8HP/29.5HP without gearbox, electric speed shift with spindle motor, maximum torque of 36kgf-m 260 lb-ft. (option).
- The quill type spindle housing is with cooling system to assure the best temperature control of the spindle head, and for the best machining results.
- Deployed with precise angular contact ceramic ball bearings for extra axial and radial rigidity to fit the requirements of heavy cutting.

POWER		TORQUE	
Low Speed	High Speed	Low Speed	High Speed



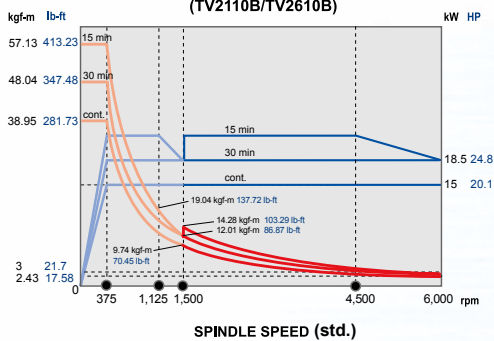
### STANDARD 6,000 rpm

(TV116B/TV146B/TV158B/TV188B)

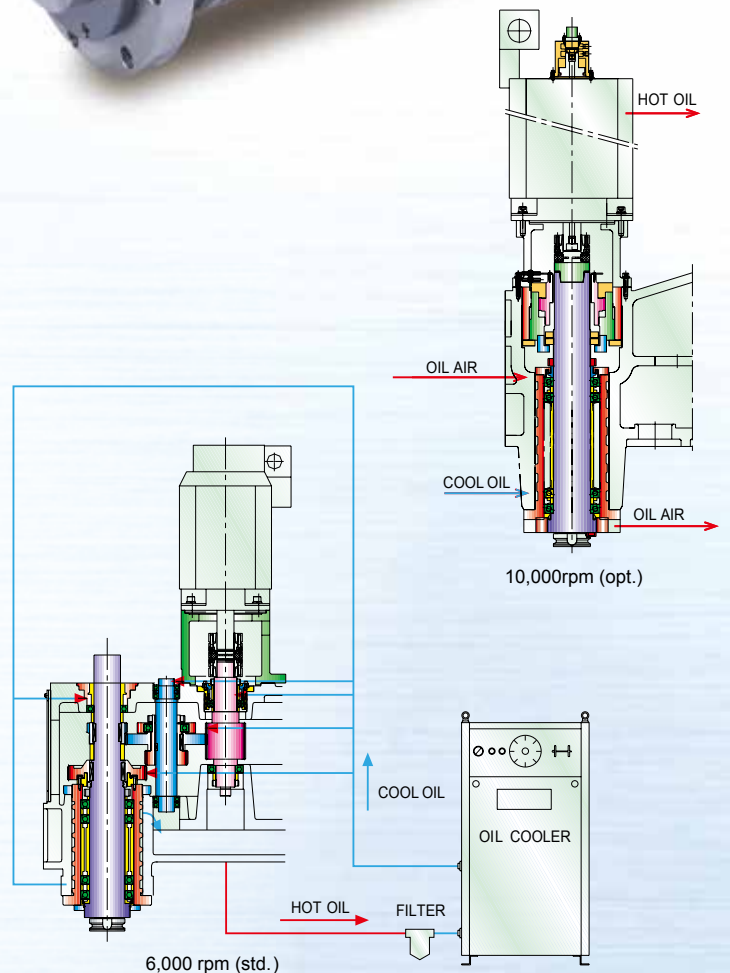
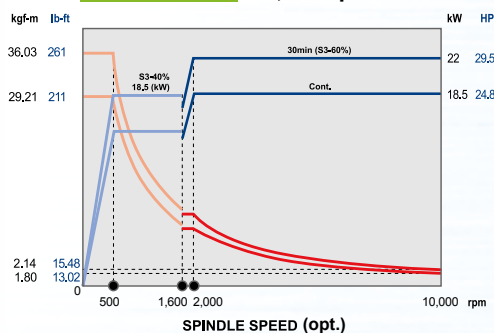


### STANDARD 6,000 rpm

(TV2110B/TV2610B)



### OPTIONAL 10,000 rpm



# 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 Structure

### TV116B ACCURACY

ACCURACY	ISO 10791-4	YCM*
Axial Travel	Full Length	
Positioning (X/Y/Z) A	0.042 / 0.025 / 0.025mm 0.0017" / 0.0010" / 0.0010"	0.014 / 0.014 / 0.014mm 0.0006" / 0.0006" / 0.0006"
Repeatability (X/Y/Z) R	0.020 / 0.015 / 0.015mm 0.0008" / 0.0006" / 0.0006"	0.010 / 0.010 / 0.010mm 0.0004" / 0.0004" / 0.0004"

\* All values shown above are measured for the machine in good air-conditioned environments.

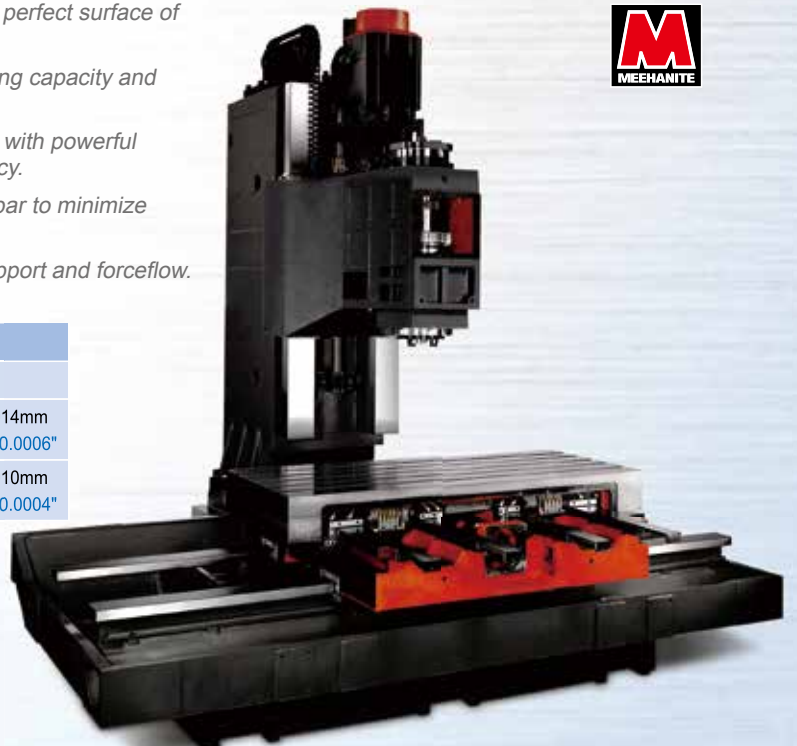
### Axial Rapid Feedrate

<b>X</b>	<b>16m/min. 630ipm</b>
<b>Y</b>	<b>16m/min. 630ipm</b>
<b>Z</b>	<b>16m/min. 630ipm</b>

# TV Series 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 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.
- The Y-axis is equipped with 4 guideways to gain the best support and forceflow.



TV146B Y-axis 4 Guideways Design

### TV146B ACCURACY

ACCURACY	ISO 10791-4	YCM*
Axial Travel	Full Length	
Positioning (X/Y/Z) A	0.042 / 0.025 / 0.025mm 0.0017" / 0.0010" / 0.0010"	0.014 / 0.014 / 0.014mm 0.0006" / 0.0006" / 0.0006"
Repeatability (X/Y/Z) R	0.020 / 0.015 / 0.015mm 0.0008" / 0.0006" / 0.0006"	0.010 / 0.010 / 0.010mm 0.0004" / 0.0004" / 0.0004"

\* All values shown above are measured for the machine in good air-conditioned environments.

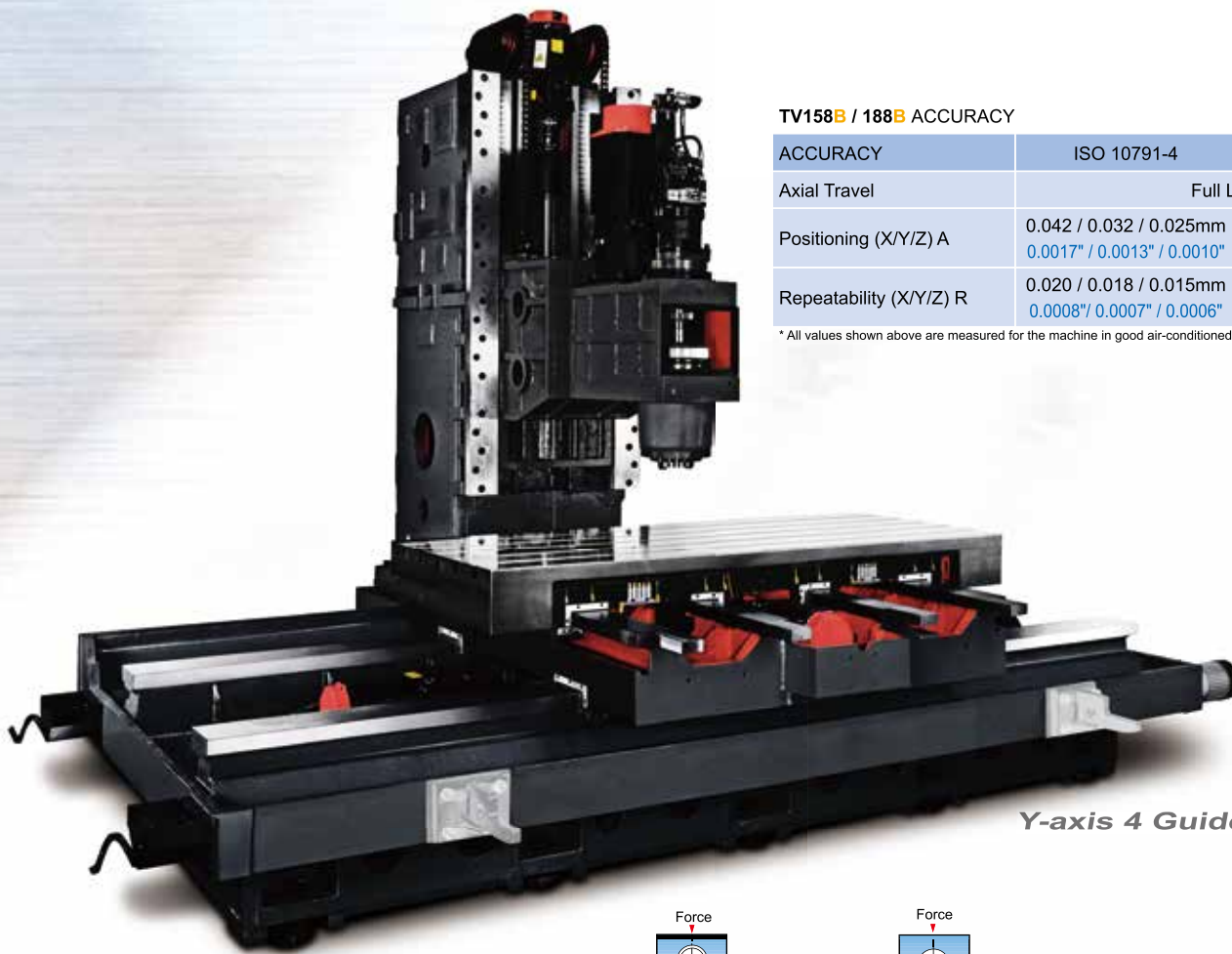
### Axial Rapid Feedrate

<b>X</b>	<b>16m/min. 630ipm</b>
<b>Y</b>	<b>16m/min. 630ipm</b>
<b>Z</b>	<b>16m/min. 630ipm</b>

# 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.

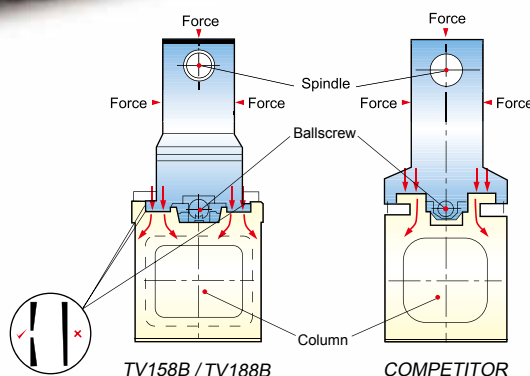


### TV158B / 188B ACCURACY

ACCURACY	ISO 10791-4	YCM*
Axial Travel	Full Length	
Positioning (X/Y/Z) A	0.042 / 0.032 / 0.025mm 0.0017" / 0.0013" / 0.0010"	0.014 / 0.014 / 0.014mm 0.0006" / 0.0006" / 0.0006"
Repeatability (X/Y/Z) R	0.020 / 0.018 / 0.015mm 0.0008" / 0.0007" / 0.0006"	0.010 / 0.010 / 0.010mm 0.0004" / 0.0004" / 0.0004"

\* All values shown above are measured for the machine in good air-conditioned environments.

### Y-axis 4 Guideways



### Axial Rapid Feedrate

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





# TV Series 2110B/2610B

## High Rigidity Axial Movement

- X, Y, Z axis precision ball screw of JIS C3 class, with the use of precision angular contact ball bearings, adopting screw pretension way to provide the best feed accuracy and rigidity.
- Wide T-base structure design that enables X-axis travel is completely contained within the base of the slide. Overhang free while table moving that ensures stable movement during heavy cutting.
- Y-axis is equipped with 4 guideways to gain the best support and to reinforce the 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.
- Inner-rail design on Z-axis ensures smooth movement of the headstock during heavy cutting performance. Slide surface adopted heat treatment, with Turcite-B to reduce friction. Meanwhile, the automatic lubrication system provides lubrication of each slide surface to ensure accuracy and longevity.

## High Rigidity Guideway Design

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

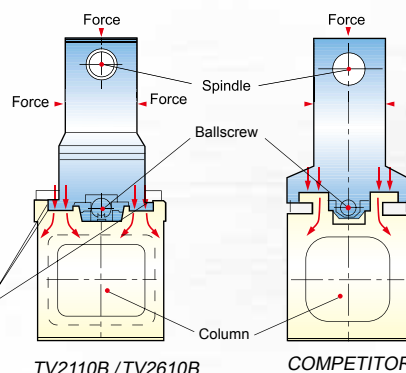


## TV2110B / 2610B ACCURACY

ACCURACY	ISO 10791-4	YCM*
Axial Travel	Full Length	
Positioning (X/Y/Z) A	0.042 / 0.032 / 0.025mm 0.0017" / 0.0013" / 0.0010"	0.014 / 0.014 / 0.014mm 0.0006" / 0.0006" / 0.0006"
Repeatability (X/Y/Z) R	0.020 / 0.018 / 0.015mm 0.0008" / 0.0007" / 0.0006"	0.010 / 0.010 / 0.010mm 0.0004" / 0.0004" / 0.0004"

\* All values shown above are measured for the machine in good air-conditioned environments.

## Y-axis Complex 4 Guideways Design



## Axial Rapid Feedrate

<b>X</b>	12m/min. 472ipm
<b>Y</b>	12m/min. 472ipm
<b>Z</b>	12m/min. 472ipm

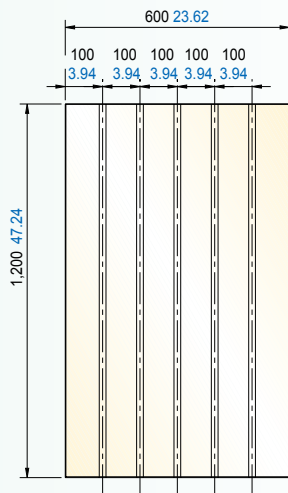


# TV Series 116B

## DIMENSIONS

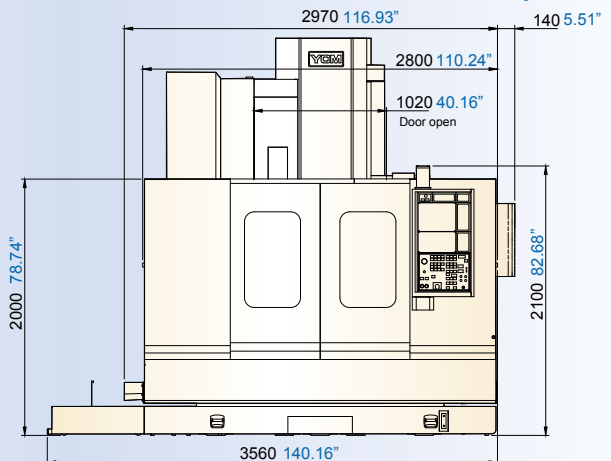
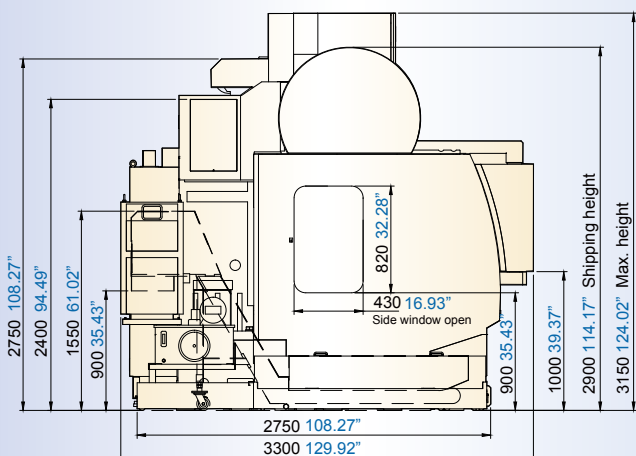
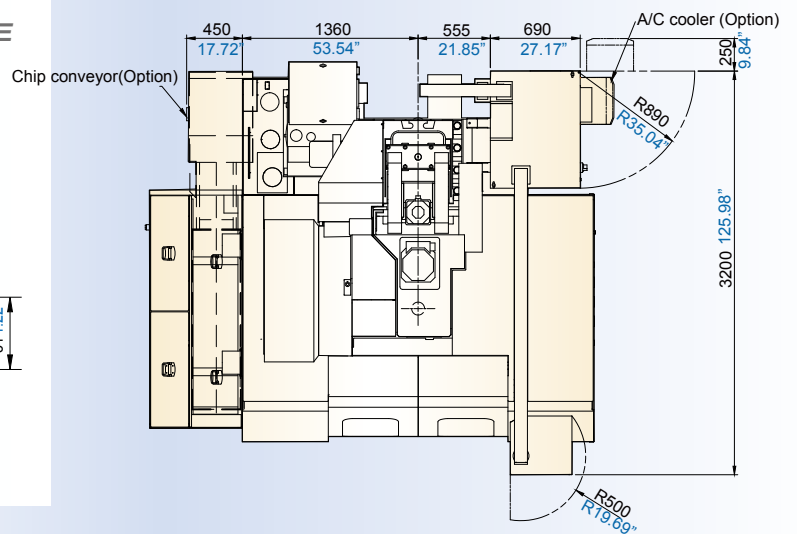
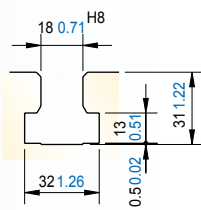


The appearance of the machines will be diverse due to different model.



### TABLE SIZE

### T-SLOTS

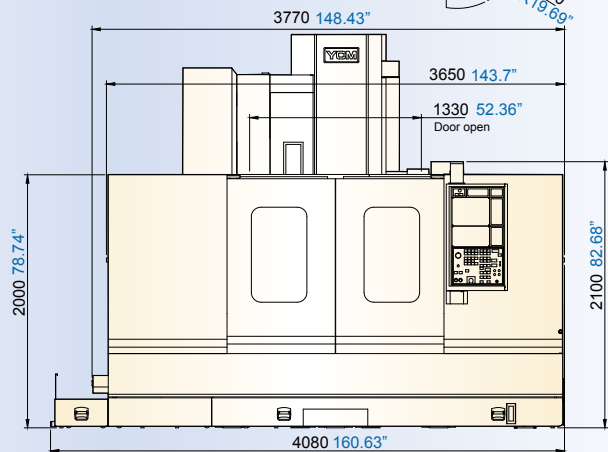
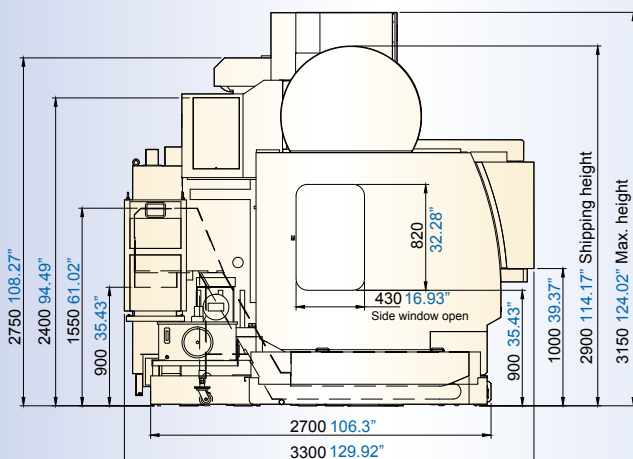
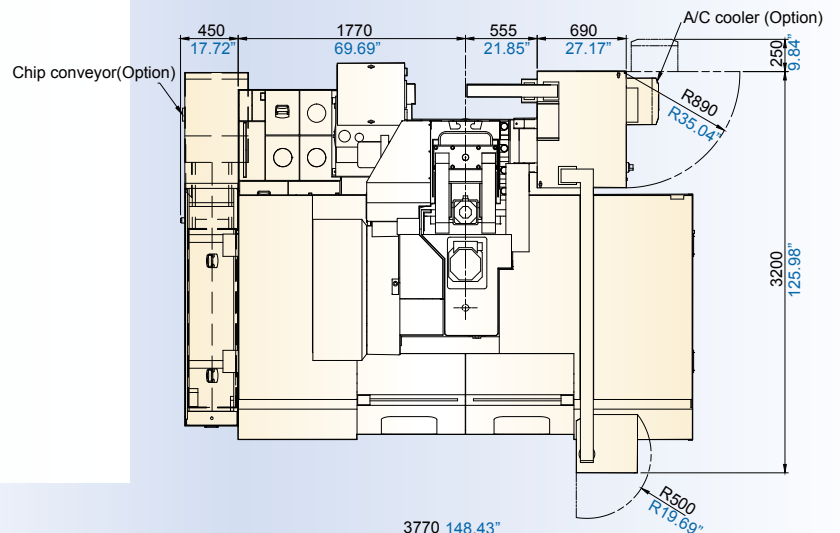
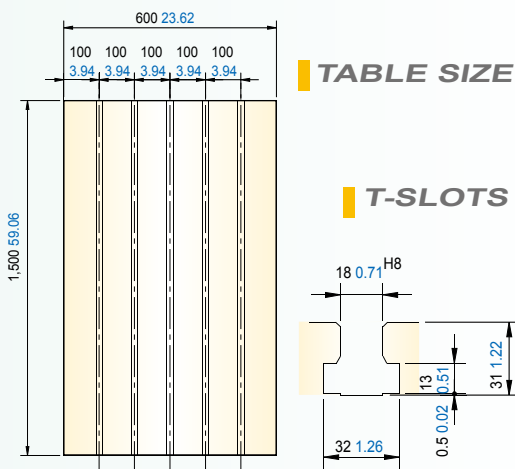


# TV Series 146B

## DIMENSIONS



The appearance of the machines will be diverse due to different model.

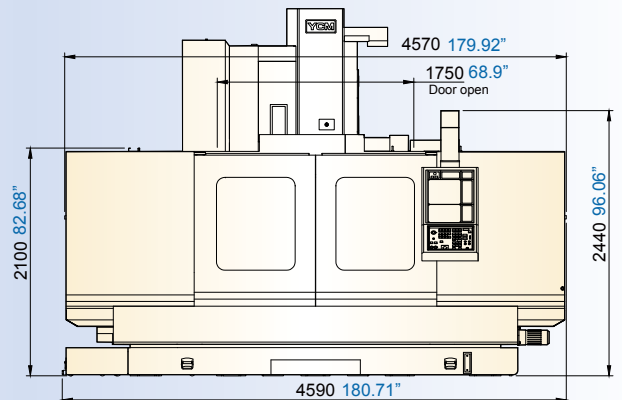
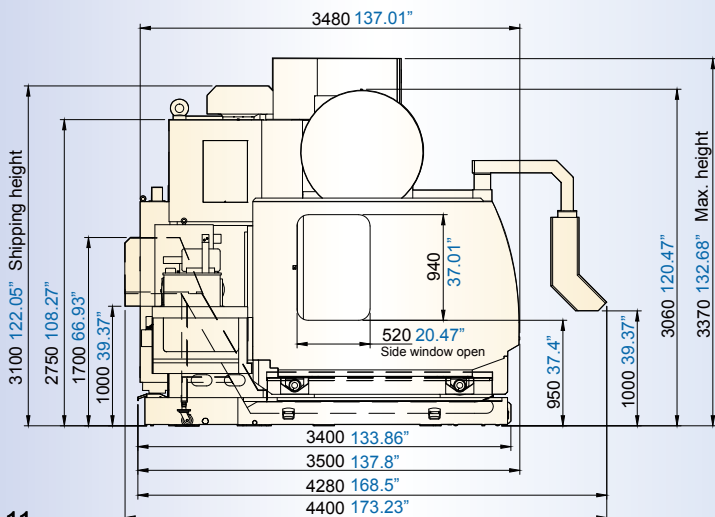
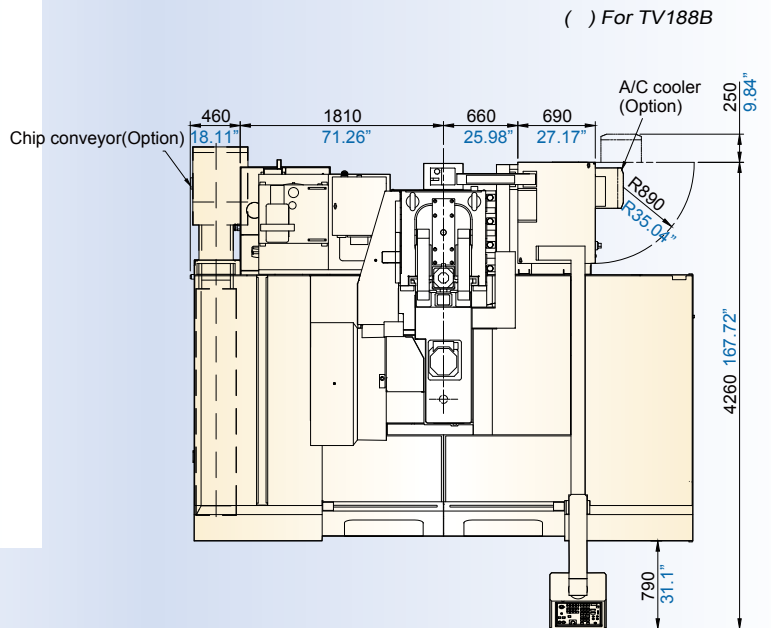
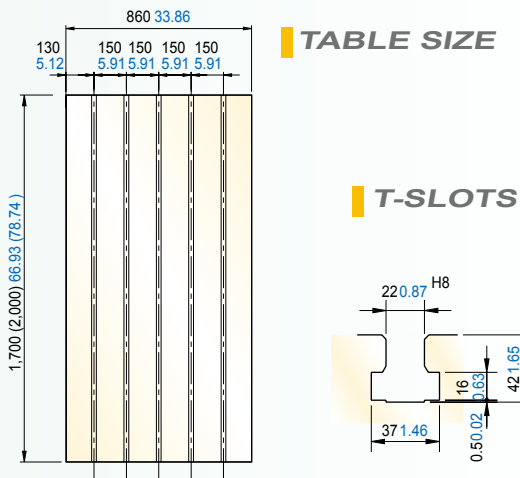


# TV Series 158B/188B

## DIMENSIONS



The appearance of the machines will be diverse due to different model.



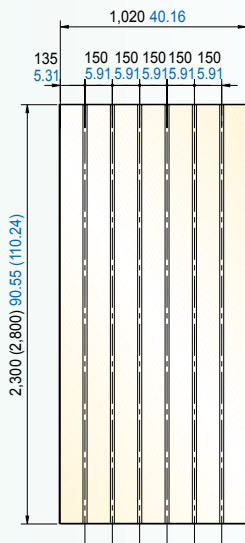
# TV

## Series 2110B/2610B

### DIMENSIONS

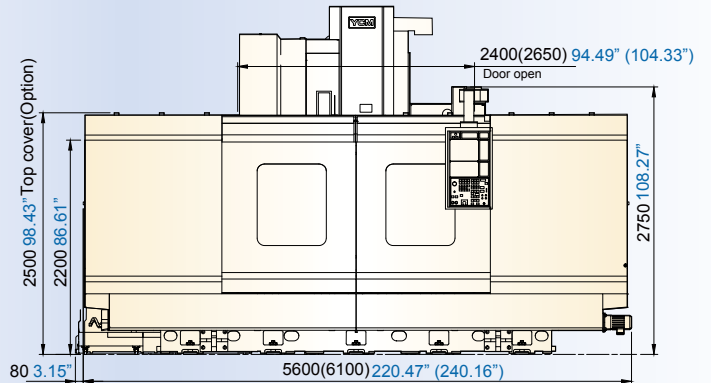
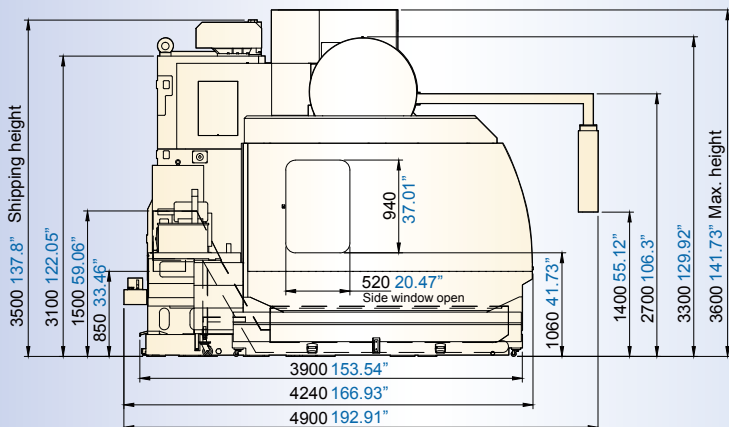
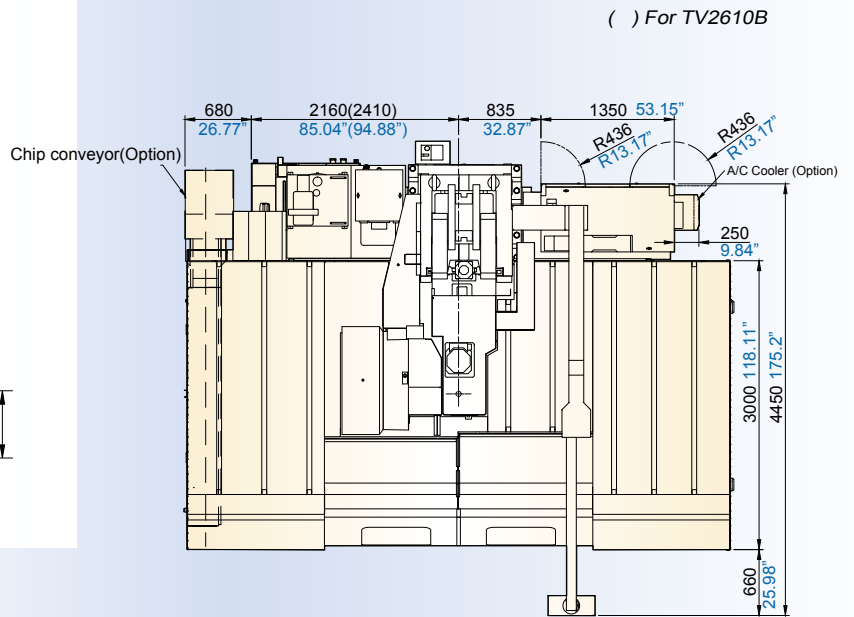
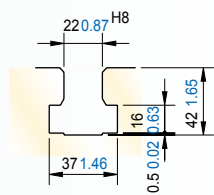


The appearance of the machines will be diverse due to different model.



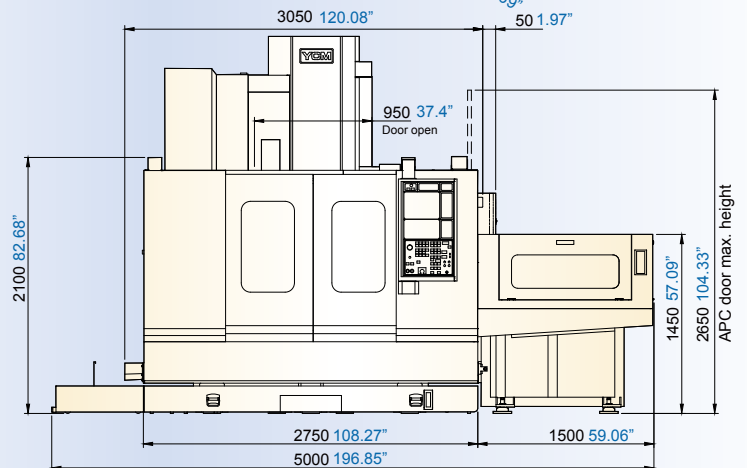
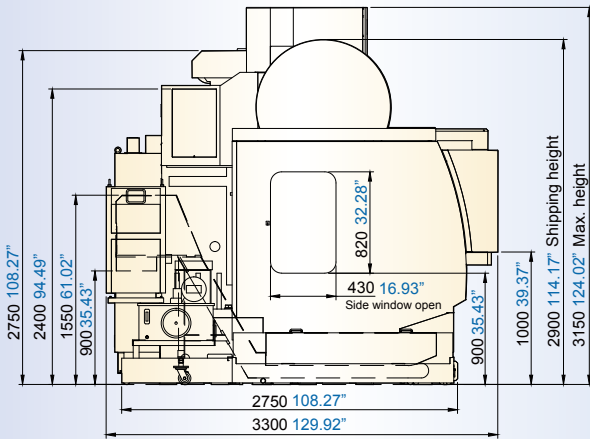
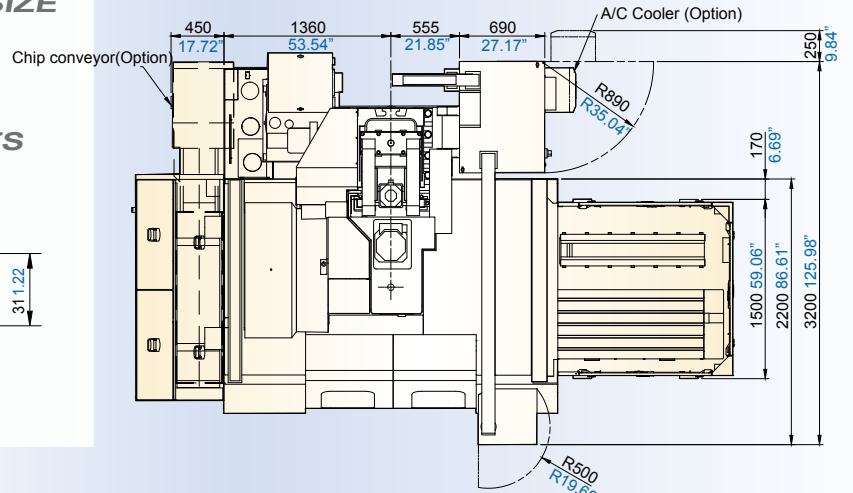
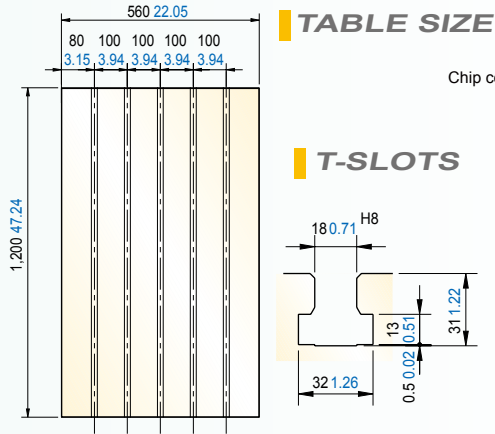
#### TABLE SIZE

#### T-SLOTS



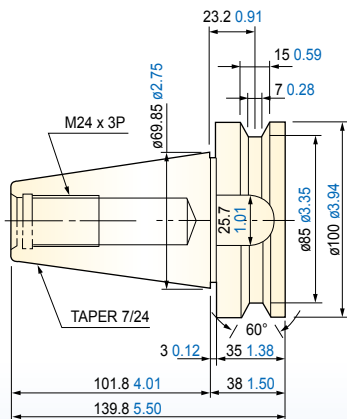
# TV Series 116B + APC

## DIMENSIONS

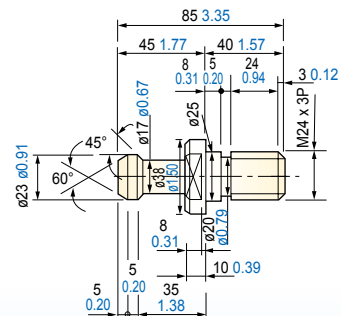


### PULL STUD AND TOOL SHANK

**BT50**



**MAS-P50T-1**



Unit : mm inch

## SPECIFICATIONS

	TV116B	TV146B	TV158B	TV188B	TV2110B	TV2610B
<b>SPINDLE</b>						
Spindle Speed (opt.)	6,000rpm (10,000rpm)					
Spindle Power (opt.)	15/18.5kW (18.5/22kW) 20/24.8HP (24.8/29.5HP)			15/18.5/22kW (18.5/22kW) 20/24.8/29.5HP (24.8/29.5HP)		
Spindle Taper (opt.)	BT50 (BBT50)					
Front Bearing Diameter	ø100mm ø3.94"					
<b>TRAVEL</b>						
X-axis Travel	1,100mm 43.31"	1,400mm 55.12"	1,500mm 59.06"	1,800mm 70.87"	2,100mm 82.68"	2,600mm 102.36"
Y-axis Travel	600mm 23.62"	620mm 24.41"	860mm 33.86"	860mm 33.86"	1,020mm 40.16"	1,020mm 40.16"
Z-axis Travel	630mm 24.8"	630mm 24.8"	750mm 29.53"	750mm 29.53"	762mm 30"	762mm 30"
Distance Between Spindle Nose & Table Top (APC)	168~798mm (68~698mm) 6.6"~31.42" (2.68"~27.48")	153~783mm 6.02"~30.83"	150~900mm 5.91"~35.43"	150~900mm 5.91"~35.43"	200~962mm 7.87"~37.87"	200~962mm 7.87"~37.87"
Distance Between Center & Column Front	615mm 24.21"	615mm 24.21"	920mm 36.22"	920mm 36.22"	1,070mm 42.13"	1,070mm 42.13"
<b>TABLE</b>						
Table size (APC)	1,200 × 600mm (1,200 × 560mm) 47.24" × 23.62" (47.24" × 22.05")	1,500 × 600mm 59.06" × 23.62"	1,700 × 860mm 66.93" × 33.86"	2,000 × 860mm 78.74" × 33.86"	2,300 × 1,020mm 90.55" × 40.16"	2,800 × 1,020mm 110.24" × 40.16"
Max. Load on Table (APC)	1,200kg (600kg) 2,646 lb (1,323 lb)	1,500kg 3,307 lb	2,000kg 4,409 lb	2,000kg 4,409 lb	7,000kg 15,432 lb	7,000kg 15,432 lb
The Height From Table Top to Floor (APC)	865mm (965mm) 34.06" (37.99")	880mm 34.65"	980mm 38.58"	980mm 38.58"	1,160mm 45.67"	1,160mm 45.67"
T-Slots × Size × Pitch	5 × 18mm × 100mm 5 × 0.71" × 3.94"		5 × 22mm × 150mm 5 × 0.87" × 5.91"		6 × 22mm × 150mm 6 × 0.87" × 5.91"	
<b>FEEDRATE</b>						
Rapid Feedrate (X/Y/Z)	16/16/16 m/min. 630/630/630ipm		15/15/12 m/min. 591/591/472ipm		12/12/12 m/min. 472/472/472ipm	
Cutting Feedrate	1~5,000 mm/min. 0.04~196.9ipm					
<b>ATC</b>						
Tool Magazine Capacity (opt.)	24T (32/40T)					
Max. Tool Dimensions (opt.)	24T : ø110 x 350mm ø4.33" x 13.78" (32/40T : ø120 x 350mm ø4.72" x 13.78")					
Max. Tool Dimensions (opt.) (W/O adjacent tools)	24T : ø190mm x 350mm ø7.48" x 13.78" (32/40T : ø240mm x 350mm ø9.45" x 13.78")					
Max. Tool Weight	20kg/pc 44 lb/pc					
Tool Changer Method	Arm Type					
Tool Selection Method	Random					
<b>GENERAL</b>						
Pneumatic Supplier	5.5kg/cm <sup>2</sup> 78.2psi					
Machine Weight (APC)	11,200kg (12,460kg) 24,692 lb (27,469 lb)	12,300kg 27,117 lb	18,000kg 39,683 lb	20,500kg 45,194 lb	25,500kg 56,217 lb	26,000kg 57,320 lb

Note: Above specifications may vary depending on the machine and the surrounding environment. The manufacturer reserves the right to modify the design, specifications, mechanisms, etc., to improve the performance of the machine without notice. The test data provided in this catalog is performed under specific test procedures and environmental conditions.

## Accessories

	116B	146B	158B	188B	2110B	2610B
Tool Kit	●	●	●	●	●	●
Work Lamp	●	●	●	●	●	●
Pilot Lamp	●	●	●	●	●	●
Optical Scale	○	○	○	○	○	○
Gear Box	●	●	●	●	●	●
Foundation Bolts	●	●	●	●	●	●
Coolant Equipment System	●	●	●	●	●	●
Oil Skimmer	○	○	●	●	●	●
Coolant Gun	●	●	●	●	●	●
Spindle Air Blast	●	●	●	●	●	●
Cutting Air Blast	●	●	●	●	●	●
Oil-Hole Holder Function	○	○	○	○	○	○
Automatic Power Off System	●	●	●	●	●	●
Oil Mist Coolant System	○	○	○	○	○	○
Chip Enclosure (w/o Top Cover)	●	●	●	●	●	●
Chip Enclosure (w/ Top Cover)	○	○	○	○	○	○
APC	○	—	—	—	—	—
Leveling Blocks	●	●	●	●	●	●
Central Automatic Lubrication System	●	●	●	●	●	●

	116B	146B	158B	188B	2110B	2610B
Spindle Cooling System	●	●	●	●	●	●
Coolant Through Spindle System	○	○	○	○	○	○
4th Axis Rotary Table	○	○	○	○	○	○
Guideway Cover (X/Y/Z)	●	●	●	●	●	●
Rigid Tapping	●	●	●	●	●	●
Hydraulic System	●	●	●	●	●	●
Dual Chip Auger	●	●	●	●	●	●
A.F.C. Adaptive Feedrate Control	○	○	○	○	○	○
Mechanical, Electrical & Operating Manuals	●	●	●	●	●	●
Heat Exchanger for Electrical Cabinet	●	●	●	●	●	●
A/C Cooler for Electrical Cabinet	○	○	○	○	○	○
Chip Conveyor	○	○	○	○	○	○
Circular Coolant Nozzle	○	○	●	●	●	●
Heavy Duty Coolant Pump	○	○	●	●	●	●
Work Piece Measurement System	○	○	○	○	○	○
Auto Tool Length Measurement System	○	○	○	○	○	○
CNC Control : MXP-200FB+	●	●	●	●	●	●
CNC Control : MXP-200FC	○	○	○	○	○	○



**YCM**<sup>®</sup>

# MXP-200FB+



## Communication Interface

RJ45 Ethernet  
RS-232C  
USB  
CompactFlash Card

## Excellent Vision Quality

10.4" LCD display

## User-Friendly Design

Detachable keyboard  
(QWERTY)

## Fine Surface Technology

1. AICC II+, high precision and high accuracy AI contour control
2. Smooth tolerance control+
3. Machining quality level adjustment function

## Fast Cycle Time Technology

1. Maximum 400 blocks of look-ahead for pre-calculating the machining program
2. Block processing time 1ms for achieving high-speed machining requirement
3. Smart rigid tapping function combined with spindle capability for high-speed machining (\*Note)

## Program Dynamic Simulation

Manual Guide i features dynamic simulation of machining programs with full-screen display

## Upgraded Memory and File Organization

1. 2 MB program storage size
2. Built-in memory card for easy program editing
3. Directory filing structure with organized file management
4. 400 pairs of tool offset, 1,000 registrable programs, 48 pairs of workpiece coordinate system, 256 pairs of tool life management

\*Note: Applicable to vertical machining centers with IDD spindle and built-in motorized spindle.



**YCM**<sup>®</sup>

# i-OPERATION

Exclusive Software from **YCM**

*Plus II*

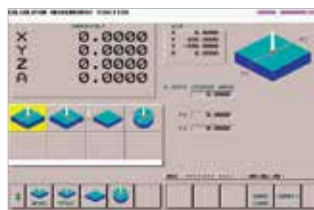


## Pre-Machining



### Intelligent Tool Data Management

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



### Workpiece Coordinate Calculation

Conversational window provides convenient and fast setup of workpiece coordinates

### RENISHAW GUI System (Conversational Graphic Operating Interface)

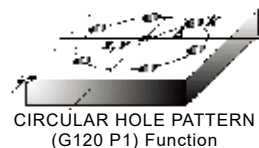


### Tool Measurement & Measurement Calibration



### Workpiece Measurement (applicable to certain models)

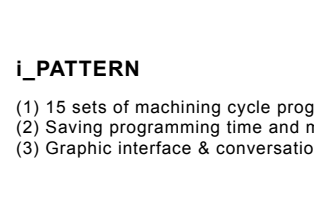
## Program Editing



CIRCULAR HOLE PATTERN  
(G120 P1) Function



RECTANGULAR HOLE PATTERN  
(G120 P4) Function



GRID HOLE PATTERN  
(G120 P5) Function

### i\_PATTERN

- (1) 15 sets of machining cycle program
- (2) Saving programming time and memory time
- (3) Graphic interface & conversational command input

## Machining

### High Performance Machining Mode M300

With 5 sets of parameter settings, it's easy to find suitable and optimized machining.

### High Speed Machining Mode M400

Reducing machining time for drilling and tapping process

### Tool Load Management

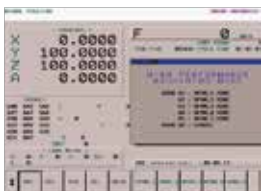
Instant tool load monitoring with alarm function

### Multi-Display Function

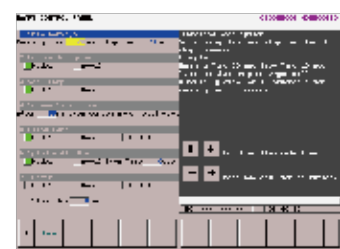
Displaying 4 statuses simultaneously with configurable status display

### Tool Life Management

Indicating tool status of each group with tool life alarm



## Smart Control Panel



### iPANEL

Easy to set up and operate important functions

## Intelligent Counter



Instantly providing users with periodic maintenance notifications and work-pieces counter management

**VMC**

*Vertical Machining Center*

YCM PRODUCT LINES®

**FP Series** High Precision High Performance Die Mold Vertical Machining Center  
**FP66A, FP100A, NFP66A**



**NXV Series** High Performance Vertical Machining Center  
**NXV600A, NXV560A-APC, NXV1020A/AM, NXV1380A, NXV1680A/B**



**TV Series** Heavy Duty Vertical Machining Center  
**TV116B, TV146B, TV158B, TV188B, TV2110B, TV2610B**

**NTV Series** High Efficiency T-base Vertical Machining Center  
**NTV158A/B**

**NMV Series** High Performance High Rigidity Vertical Machining Center  
**NMV76A, NMV106A**



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

**NFX Series** High Performance 5-axis Vertical Machining Center  
**NFX400A**

**NSV Series** Ultra High Performance Vertical Machining Center  
**NSV66A, NSV106A/AM/AS/AMS, NSV156A**



**TCV Series** High Performance Traveling Column Vertical Machining Center  
**TCV2000A, TCV3000A, TCV4500B, TCV2300A-4A, TCV3000A-4A/5AF/5AX**

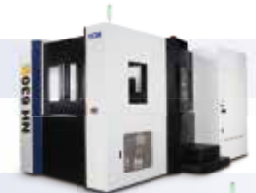
**DCV Series** Advanced Double Column Vertical Machining Center  
**DCV2012A/B, DCV3016B-6035B, DCV2018A-4018A-5AX, DCV4030B-6030B-5AX, DCV4030B-5AF**

**NDC Series** High Performance Double Column Vertical Machining Center  
**NDC2016B-4016B, NDC3022B-6027B, NDC2018B-4018B-AHC, NDC3022B-6027B-AHC**

**HMC**

*Horizontal Machining Center*

**NH Series** High Speed High Precision Horizontal Machining Center  
**NH500A, NH630B, NH800B**



**CNC LATHES**

*CNC Turning Center*

**NT Series** High Performance Mill/Turn Center  
**NT-2500SY**



**GT Series** High Performance Geo Turning Center  
**GT-200B/MA, GT-250B/MA, GT-300B/MA/LMB**

**TC Series** High Performance High Precision CNC Lathe  
**TC-16LA/LB, TC-26, TC-36, TC-46 1000/1650/2300/3200, TC-46M 3200**



**NTC Series** High Efficiency CNC Turning Center  
**NTC-2000LY/LSY**



**Integrated Operation Control System**



**Intelligent Production Management**

**Automation Solutions**



**INTEGRATION AND SOLUTIONS**



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