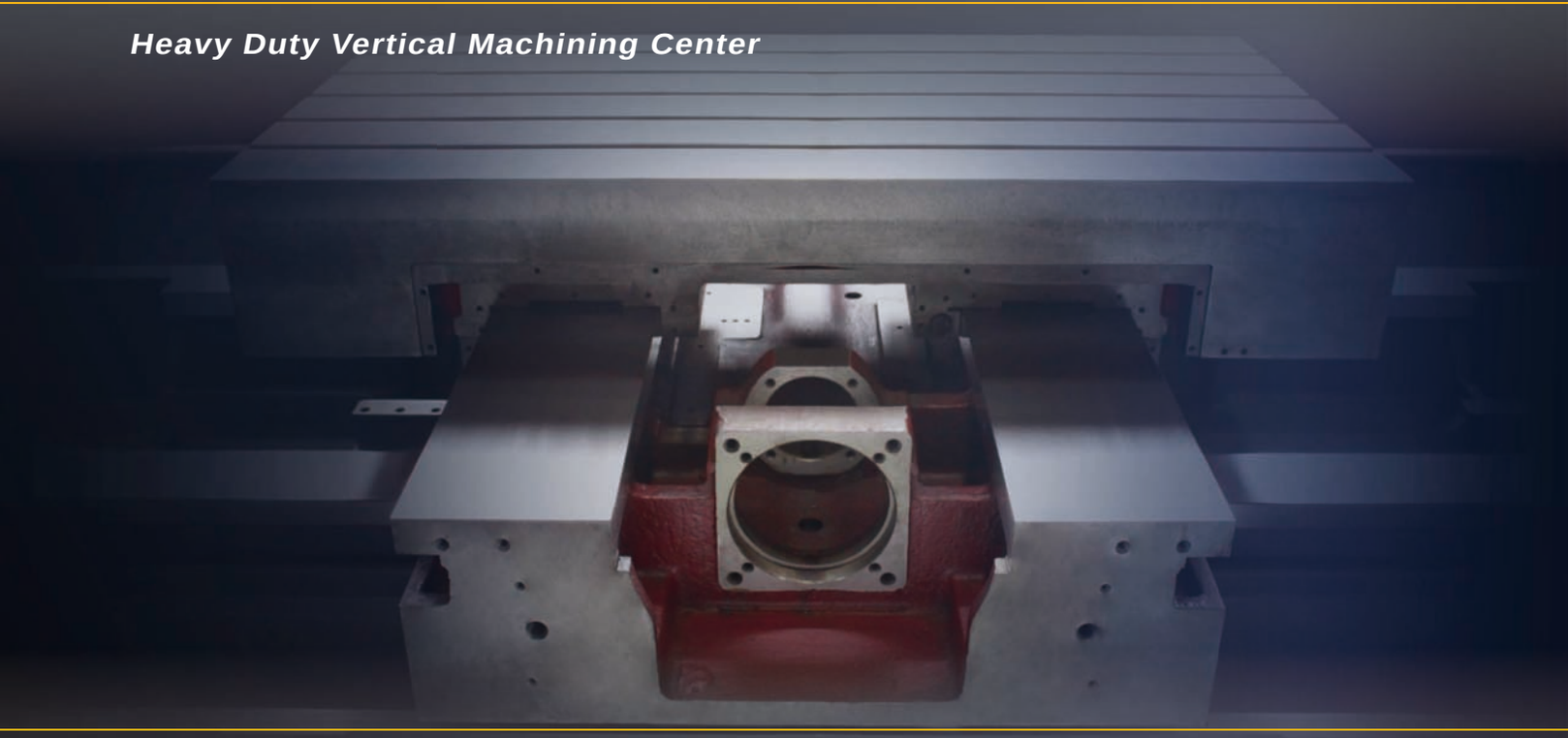
TV Series

Heavy Duty Vertical Machining Center



YCM®

TV Series

Heavy Duty Vertical Machining Centers

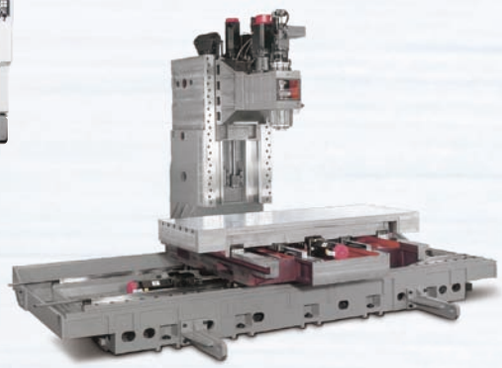
The TV series is *designed for superb machine rigidity and performance. This series is suitable for a wide range of applications like automotive, aerospace and electronics.*

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*

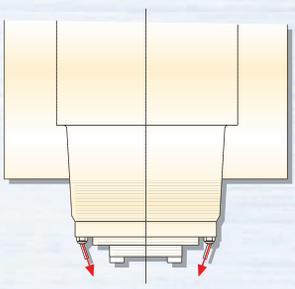


The appearance of the machines will be diverse due to different model and selectivity of controllers.

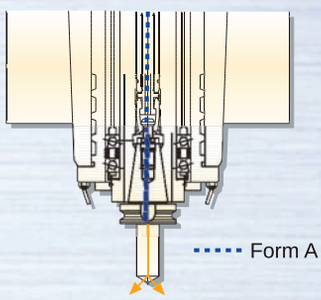
The Most Eco-friendly and Floor-saving Machine Tool of Compact Splash Enclosure & Chips Disposal System

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.

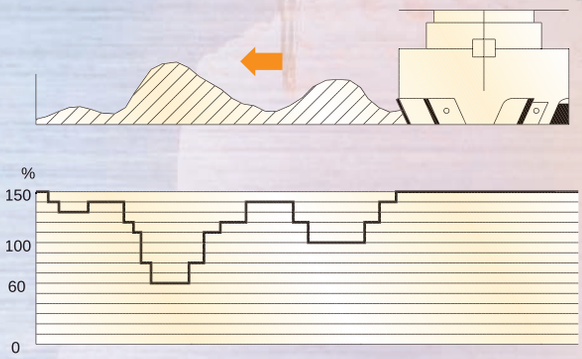
The T-base rigid structure full stroke support guarantees the most dynamic accuracy.



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

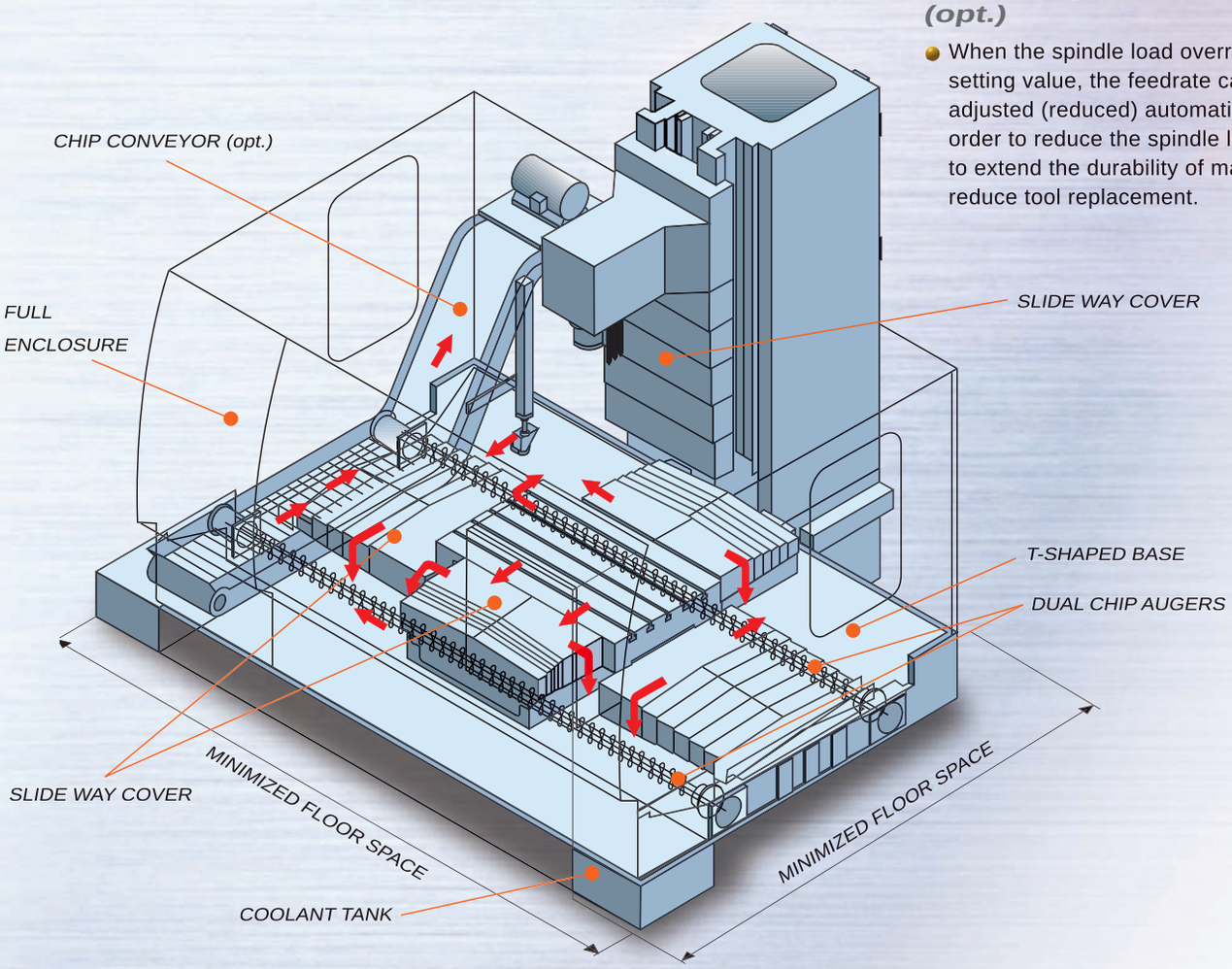


Coolant through spindle (opt.) DIN69871 Form A;
pressure: 10kg/cm² 142.23psi ;
20kg/cm² 284.46psi



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.

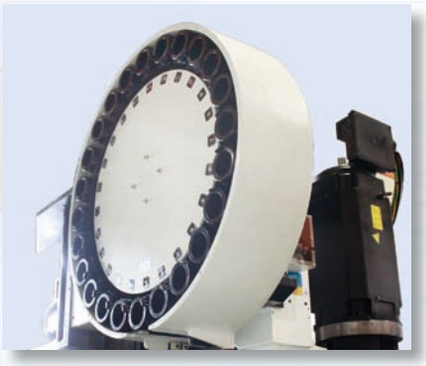


TV Series

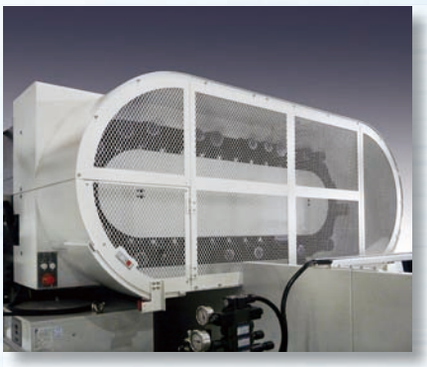
High Efficiency, High Performance, Fully Automated Production Equipment

Fast & Reliable ATC System

- The arm type ATC sysstem 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

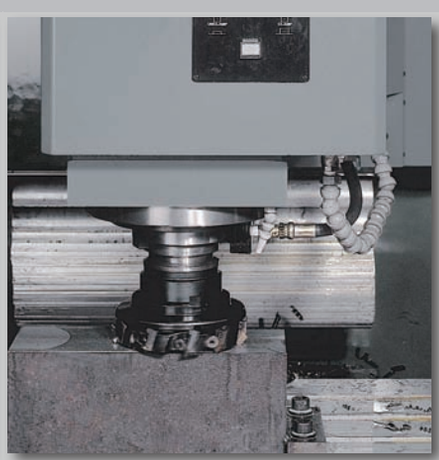
Reliable Automatic Pallet Changer System

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

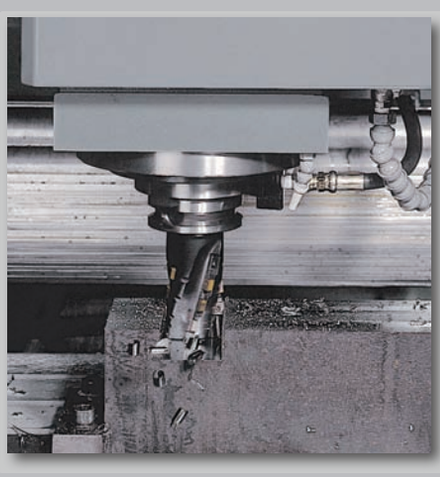
		TV116B+APC
Pallet Size	mm inch	1,200 x 560 47.24 x 22.05
Table Load Capacity	kg lb	600 1,323
Table Surface to Floor	mm inch	965 37.99

- *APC*

- *9mm Depth Face Milling (50#)*



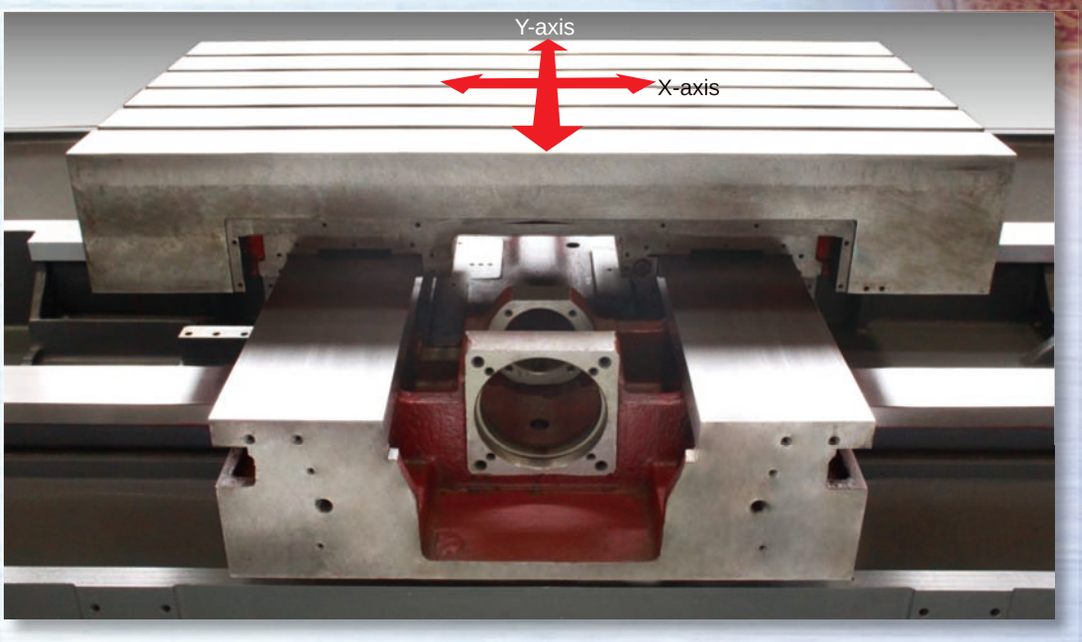
- *Optimal Chip Removal (50#) Face Milling*



- *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.

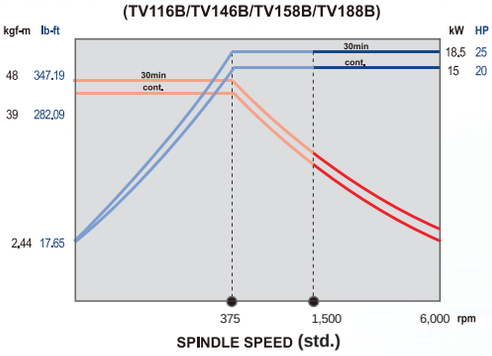
TV Series

TV116B/TV146B/TV158B/TV188B/TV2110B/TV2610B

- Standard gearhead spindle of maximum of 6,000rpm high-speed with the maximum of 15kW/18.5kW 25HP/20HP 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. (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.

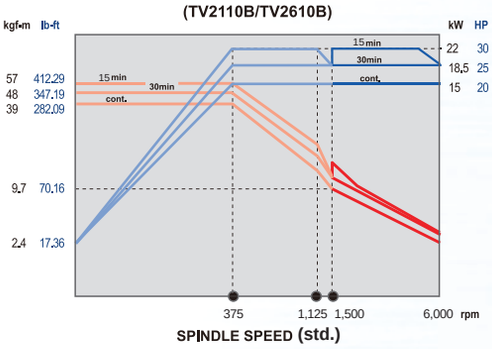
POWER **TORQUE**
L Low Speed L Low Speed
H High Speed H High Speed

STANDARD 6,000 rpm
(TV116B/TV146B/TV158B/TV188B)



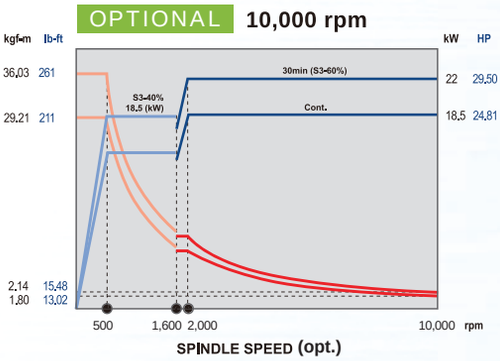
SPINDLE SPEED (std.)

STANDARD 6,000 rpm
(TV2110B/TV2610B)

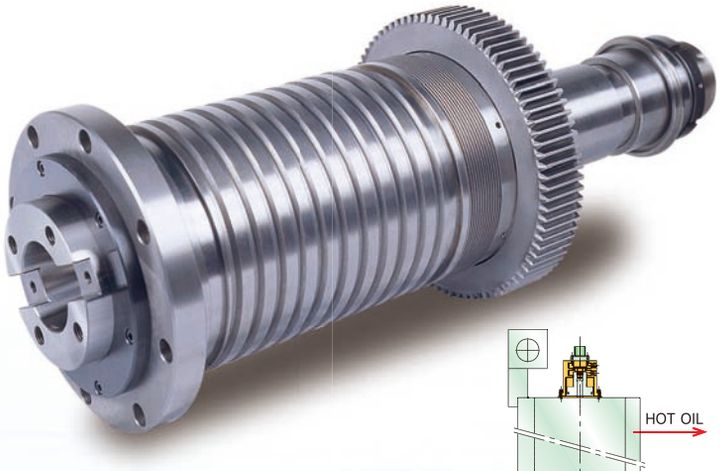


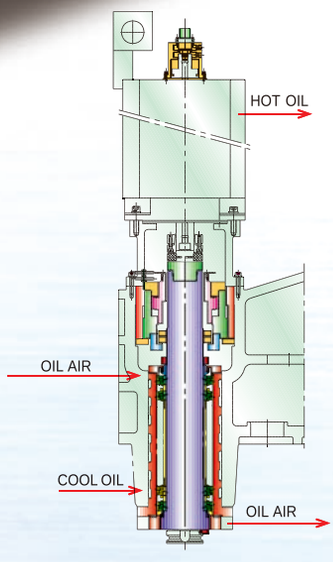
SPINDLE SPEED (std.)

OPTIONAL 10,000 rpm

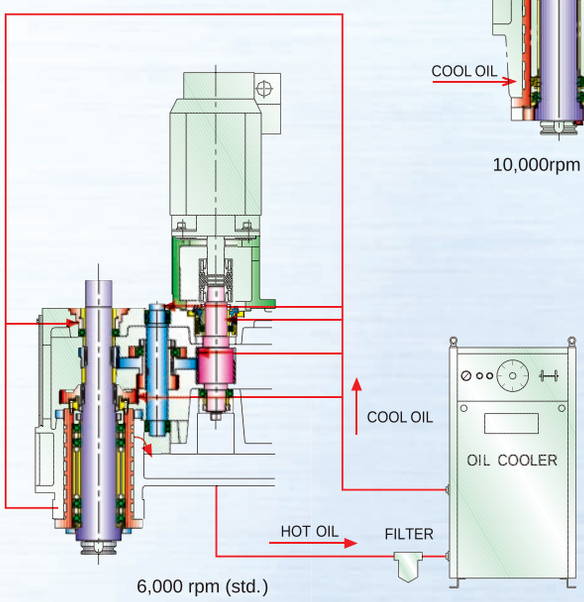


SPINDLE SPEED (opt.)





10,000rpm (opt.)



6,000 rpm (std.)

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

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

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

TV116B Structure

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 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.*

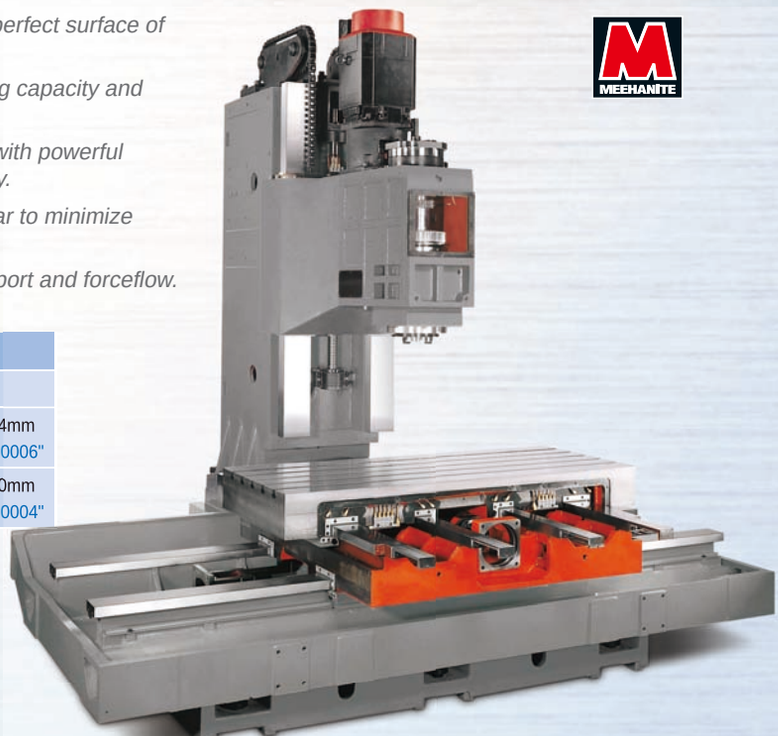
TV146B ACCURACY

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

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

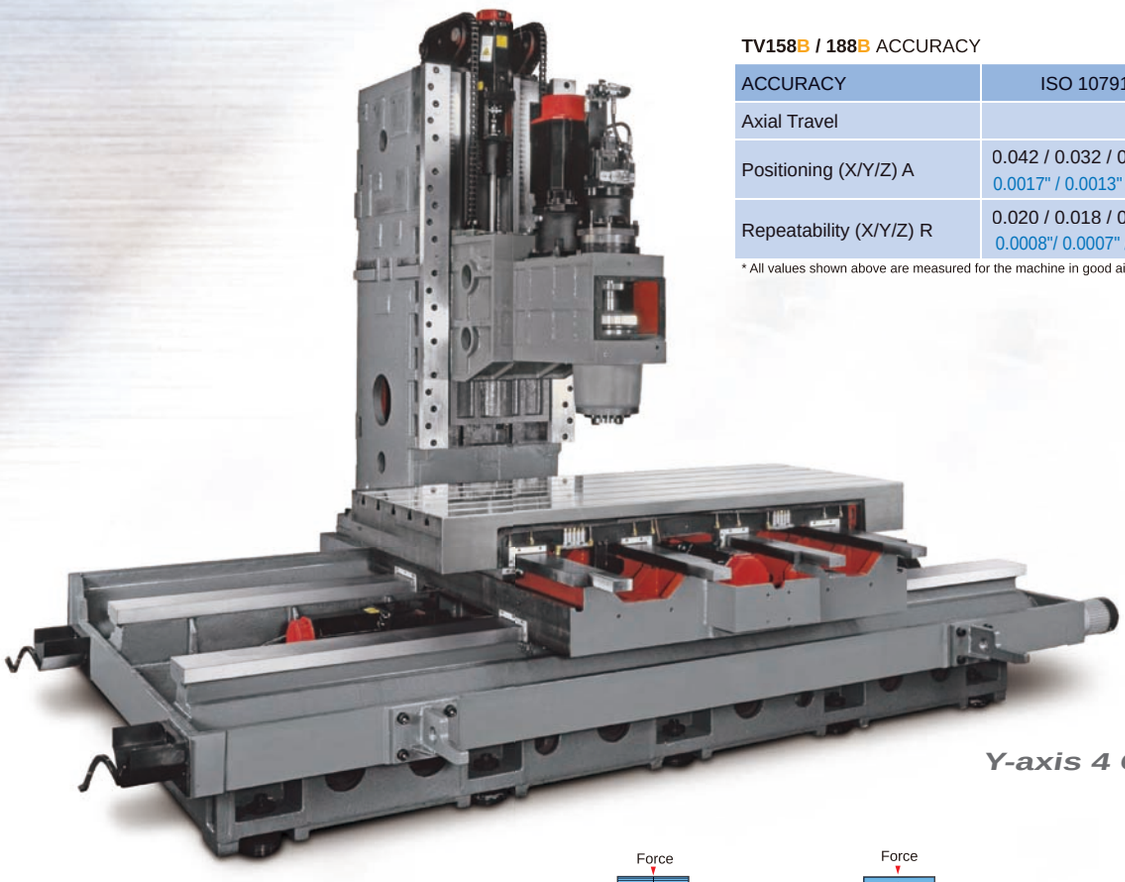


TV146B Y-axis 4 Guideways Design

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.*

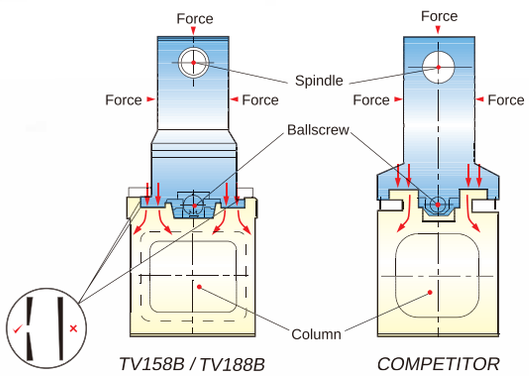


TV158B / 188B ACCURACY

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



TV158B / TV188B *COMPETITOR*

Axial Rapid Feedrate

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

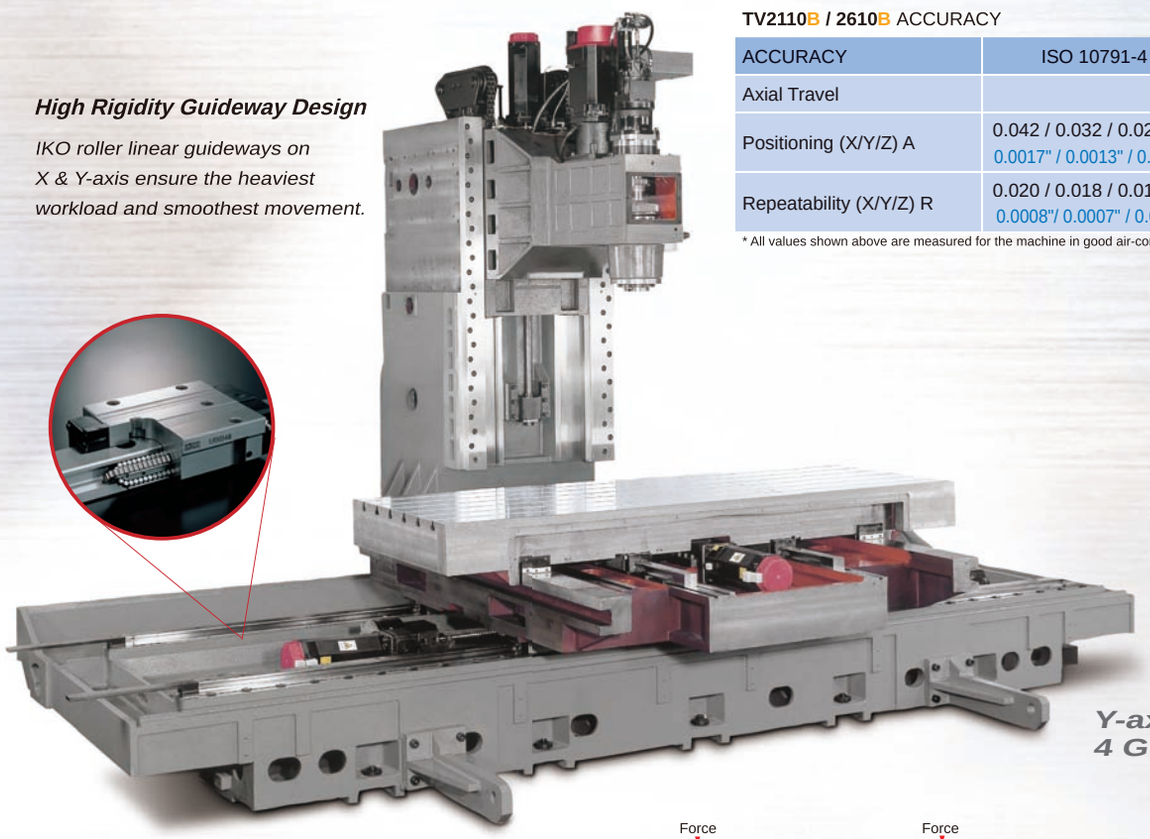
TV Series 2110B/2610B

High Rigidity Axial Movement

- *X, Y, 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.

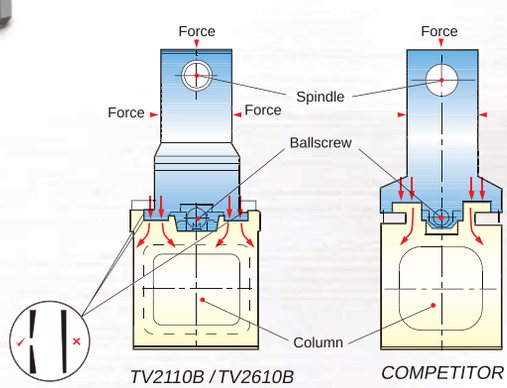


TV2110B / 2610B ACCURACY

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



TV2110B / TV2610B *COMPETITOR*

Axial Rapid Feedrate

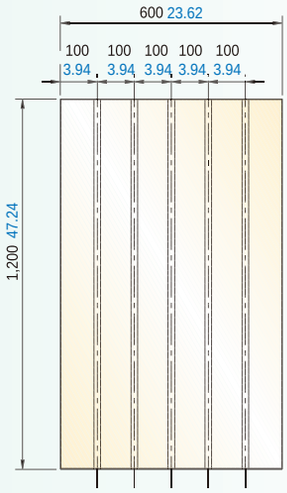
X	12m/min. 472ipm
Y	12m/min. 472ipm
Z	12m/min. 472ipm

TV Series 116B

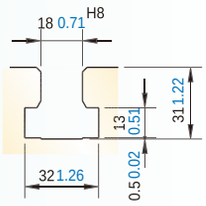
DIMENSIONS

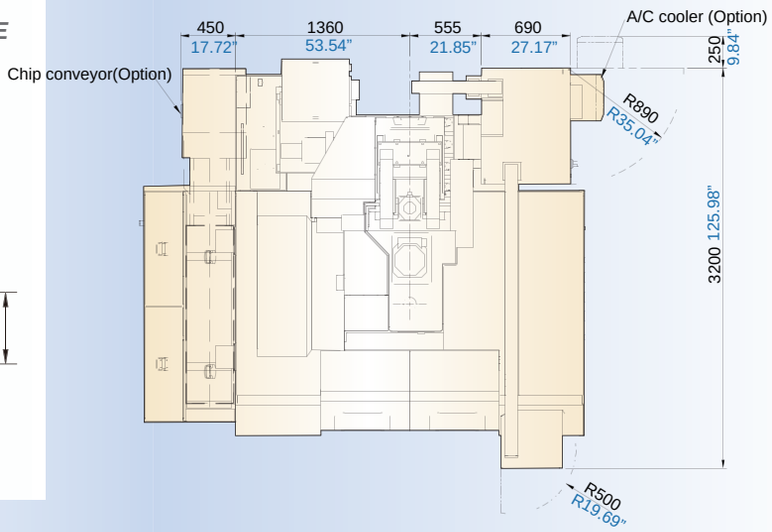
The appearance of the machines will be diverse due to different model.

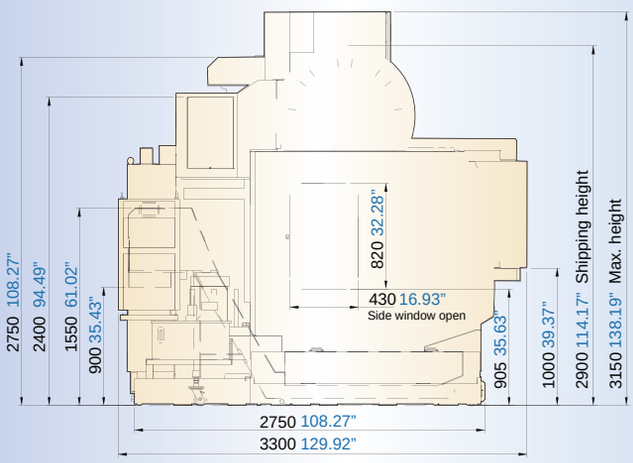
TABLE SIZE

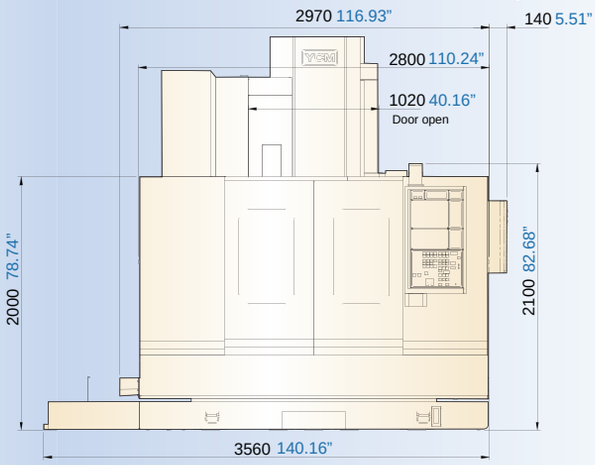


T-SLOTS









Unit : mm inch

TV Series 146B

DIMENSIONS

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

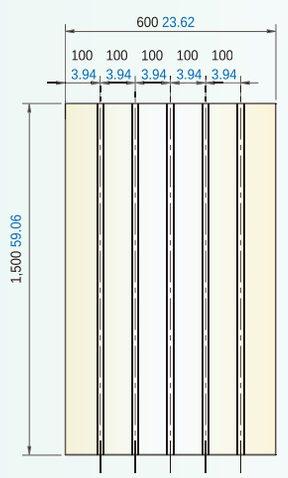
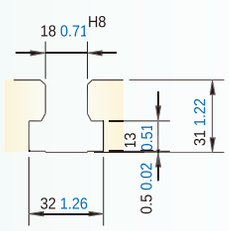
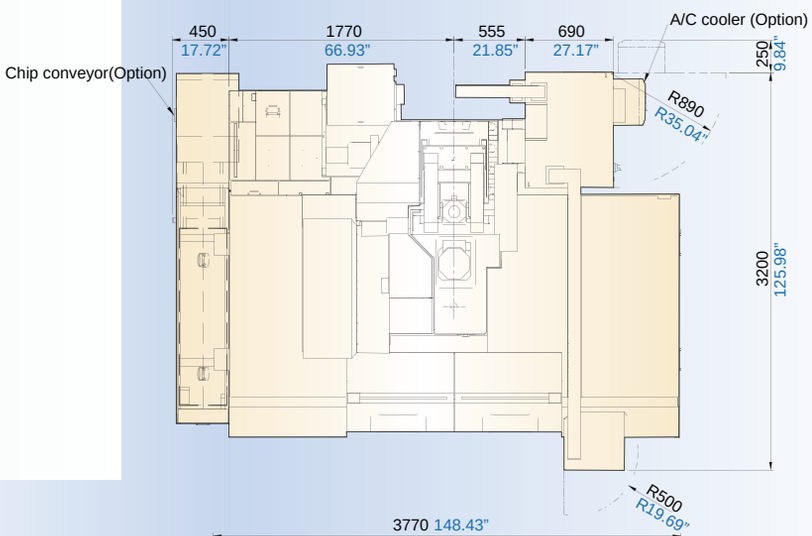
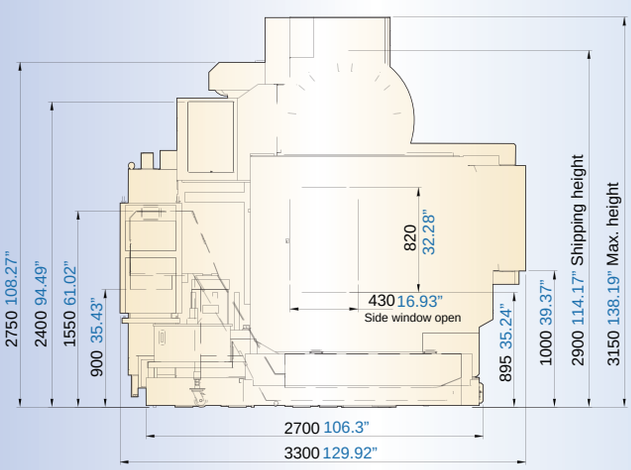


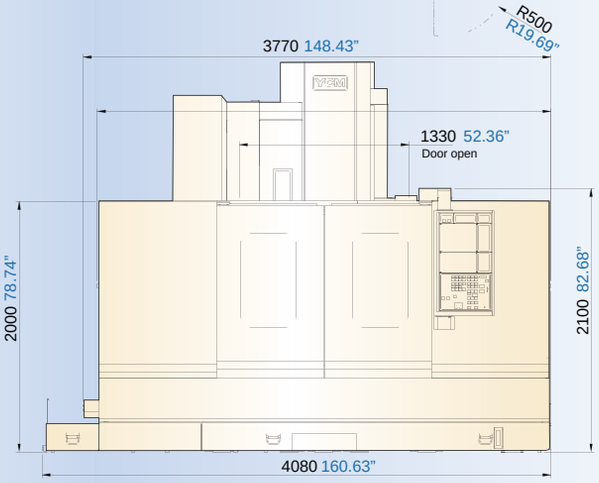
TABLE SIZE

T-SLOTS









Unit : mm inch

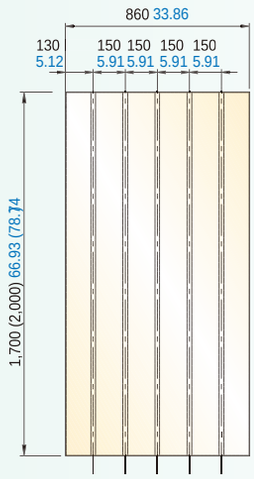
TV Series 158B/188B

DIMENSIONS

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

( ) For TV188B

TABLE SIZE



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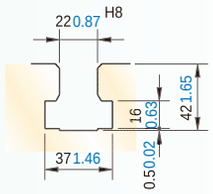
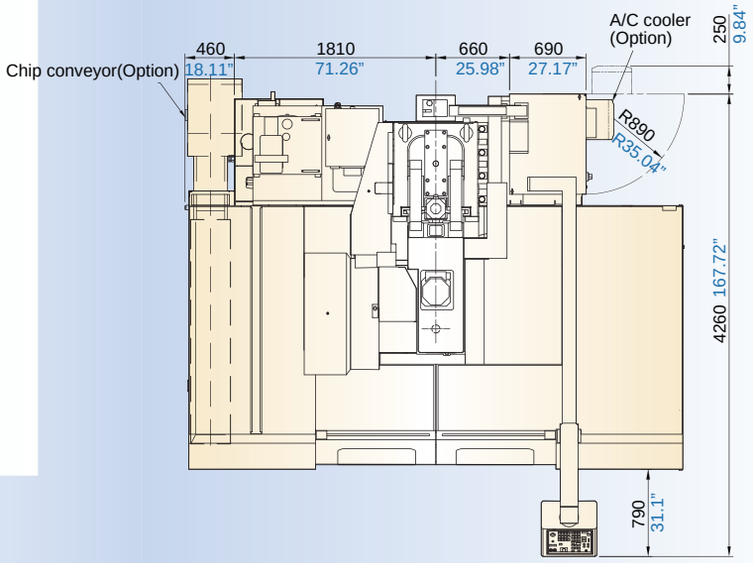
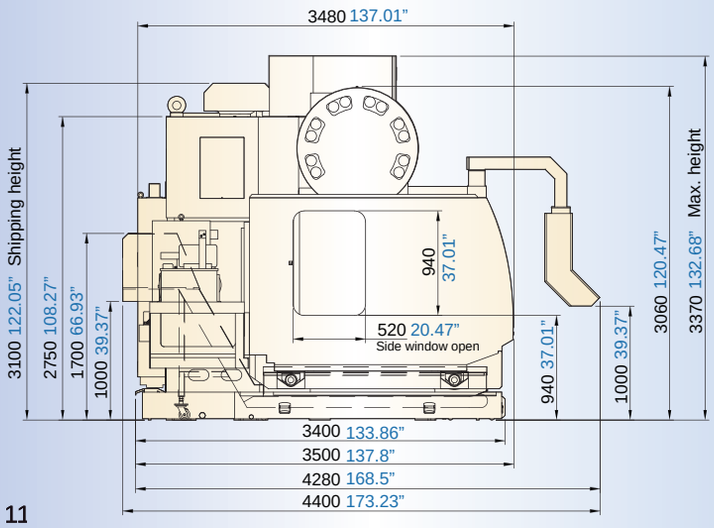
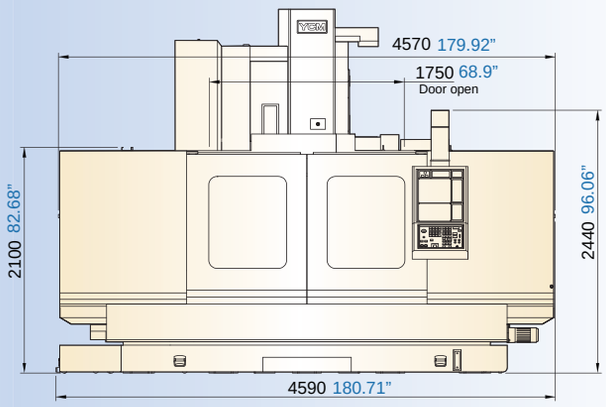








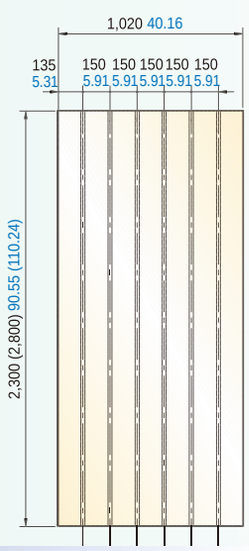
Unit : mm inch

TV Series 2110B/2610B

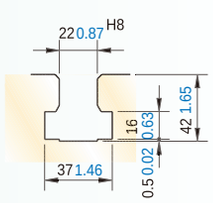
DIMENSIONS

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

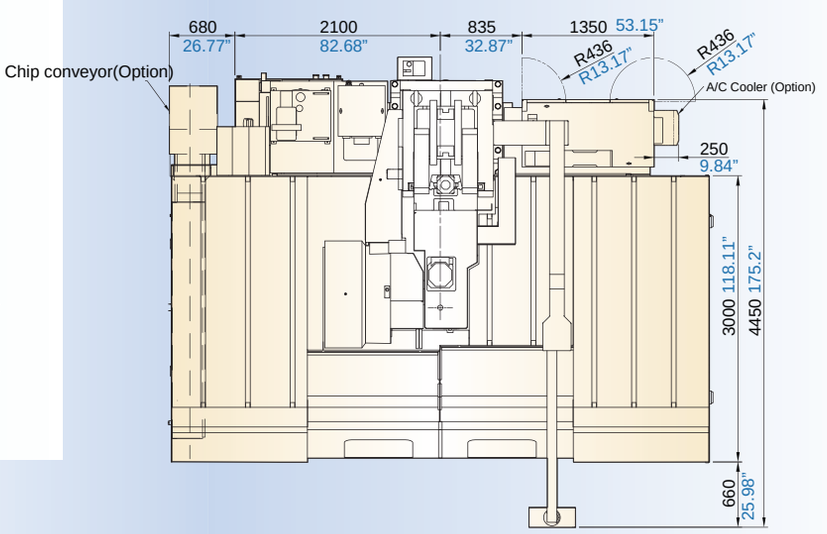
TABLE SIZE

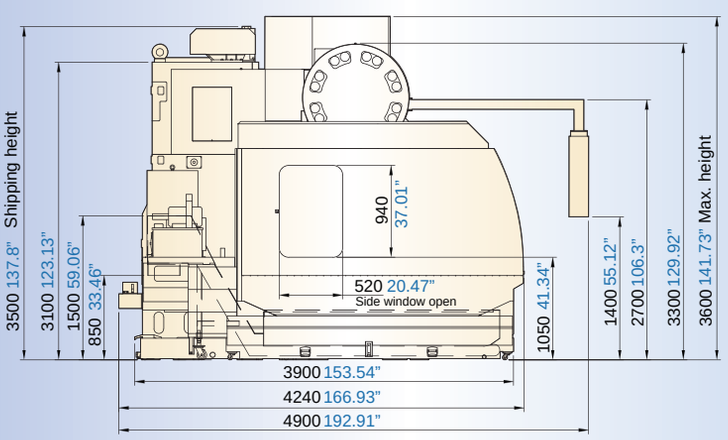


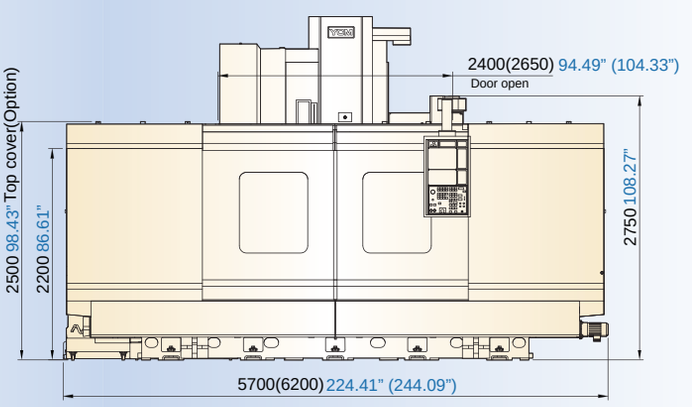
T-SLOTS



( ) For TV2610B





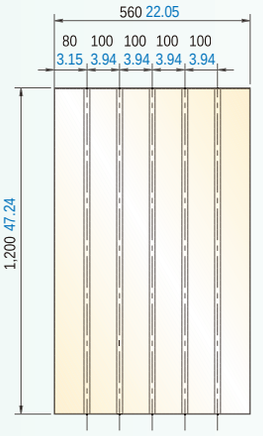


Unit : mm inch

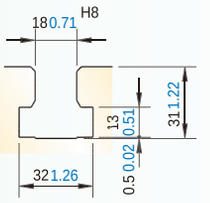
TV Series 116B + APC

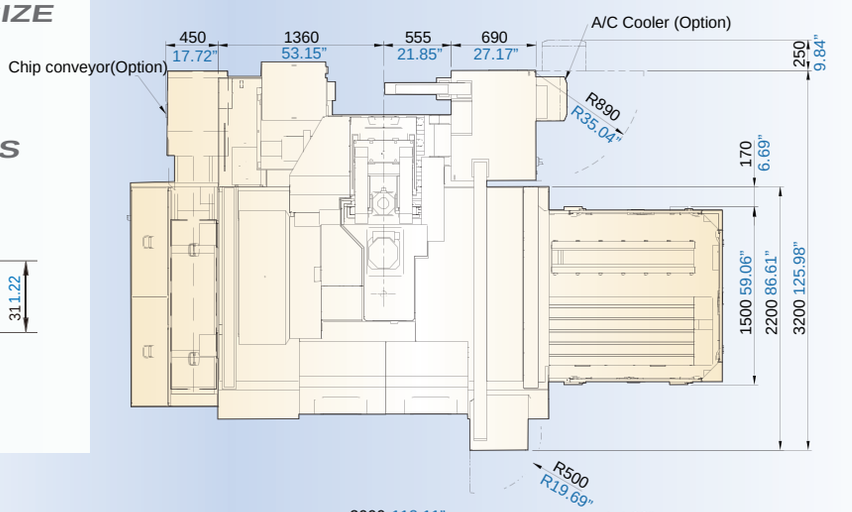
DIMENSIONS

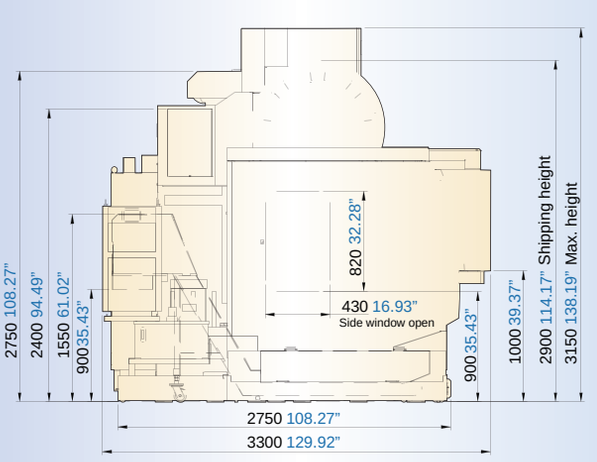
TABLE SIZE

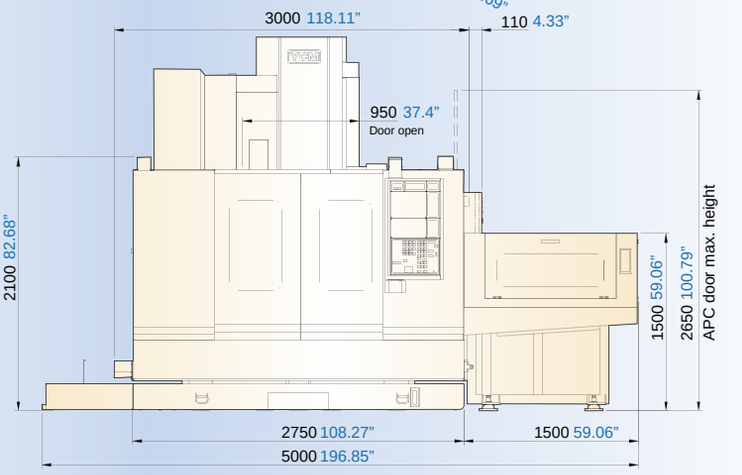


T-SLOTS



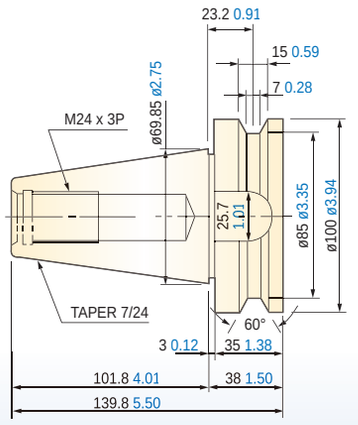




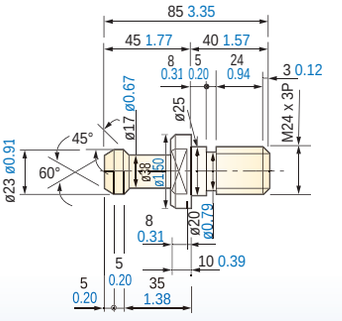


PULL STUD AND TOOL SHANK

BT50



MAS-P50T-1



Unit : mm inch

SPECIFICATIONS

	TV116B	TV146B	TV158B	TV188B	TV2110B	TV2610B
SPINDLE						
Spindle Speed (opt.)	6,000rpm (10,000rpm)					
Spindle Power (opt.)	15/18.5kW (18.5/22kW) 20/25HP (25/30HP)				15/18.5/22kW (18.5/22kW) 20/25/30HP (25/30HP)	
Spindle Taper (opt.)	BT50 (BBT50)					
Front Bearing Diameter	ø100mm ø3.94"					
TRAVEL						
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"~34.4" (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"
TABLE						
Table size (APC)	1,200 × 600mm (1,200 × 560mm) 47.24" × 23.62" (47.24" x 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 (1,543 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")	875mm 34.45"	970mm 38.22"	970mm 38.22"	1.150mm 45.28"	1.150mm 45.28"
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"	
FEEDRATE						
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					
ATC						
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					
GENERAL						
Lubrication Pump Motor	5.5kg/cm² 78.2psi					
Power Consumption (Transformer)	48kVA (65kVA)		55kVA (65kVA)		57kVA (65kVA)	
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.
Above specifications are mainly for FANUC. The data for Power Consumption (Transformer) is FANUC standard, and different spindle motor may vary from those stated here. If you have any questions about other CNC controllers, please contact YCM sales representative.

Accessories

●: Standard ○: Option —: None

	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	○	○	○	○	○	○

MXP-200 FB/FC

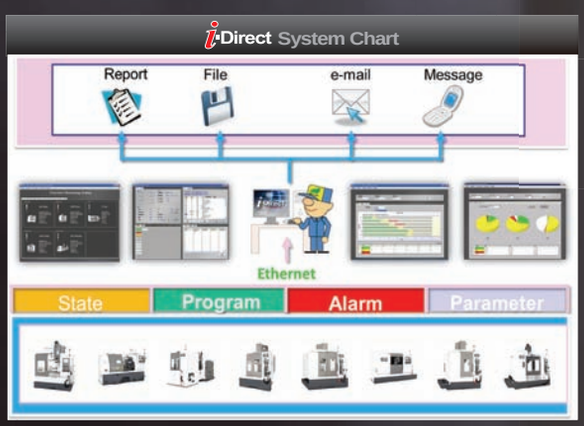
YCM CONTROL by FANUC

- High Response AC Digital Servo & Spindle Drives with High Definition
- AICC II High Speed High Accuracy with Manual / Auto Switching on/off Machining
- JERK Control Function
- High Rigidity Tapping, Helical Interpolation
- Custom Marco B and Tool Path Graphics
- Manual Guide i with large Screen Display .
- Program File Management for Easy Program Classifying
- USB Interface for Easy Parameters & CNC Programs Transfer
- 512KB Memory
- High Speed Positioning Function (MXP-200FB, opt.)
- Memory Card Program Edit & Operation
- NANO Smoothing Function (opt.)
- 400 Pairs Tool Offset, 1,000 (MXP-200FB 400) Total Registered Programs
- 48 Pairs of Workpieces Coordinate System
- Extended Parts Program Editing (Cut, Copy, and Paste. Maximum 4,000 Characters)

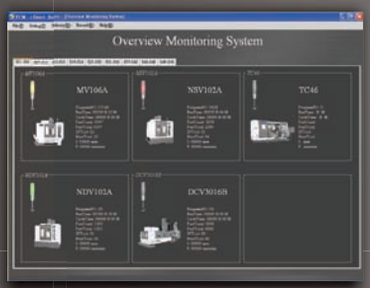
i-Direct

A remote monitoring system

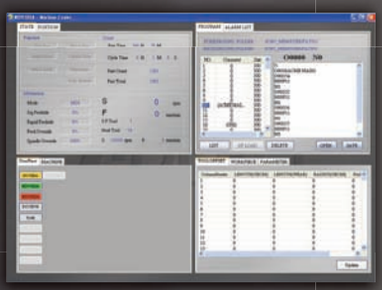
The YCM Production Line Monitoring System i-Direct overcomes the limitations of time and distance. This software provides plant operators with instant production status, including production value, output, standby, alarm time, status display and malfunction records of the machine. These data could be browsed online and printed. When incidents occur, i-Direct will automatically warn plant operators through e-mail or MMS message. With i-Direct Production Line Monitoring System the plant operators can easily keep track of production statuses regardless of time and distance.



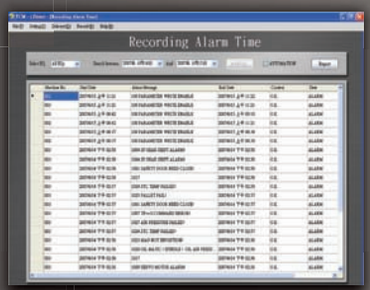
i-Direct Main Page



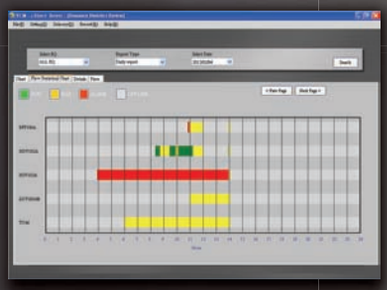
Plant Operation Status Monitoring



Single Machine Status Browsing



Machine Status Time Record



Production Status Process Record

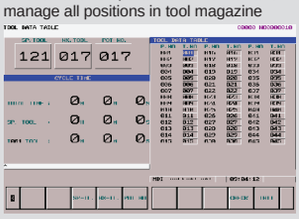
Production Management Statistics

i-OPERATION plus II

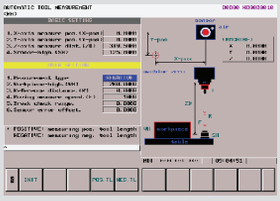
Software Enhancement Exclusively from **YCM**

Pre-machining Preparation

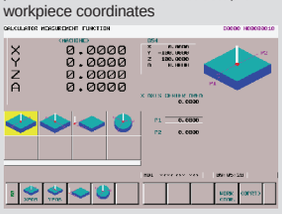
Intelligent Tool Data Management
Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine



Tool Length Measurement
Graphic measuring interface provides automatic tool length measurement function



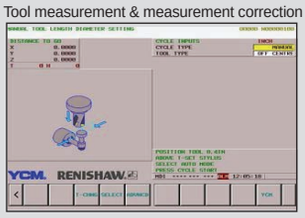
Workpiece Coordinate Calculation
Conversational operating window provides convenient and fast setup of workpiece coordinates



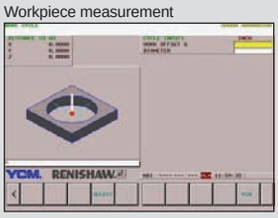
NEW

RENISHAW GUI System (Conversational Graphic Operating Interface)

Tool measurement & measurement correction



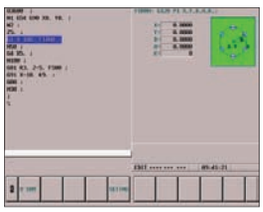
Workpiece measurement



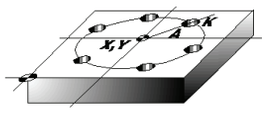
Programming

NEW

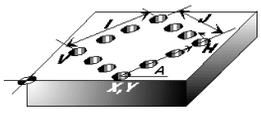
i_PATTERN



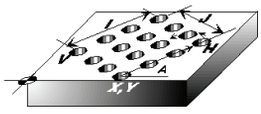
15 sets of machining cycle program
Reduces program input and memory time
Graphic interface & conversational command input



CIRCULAR HOLE PATTERN
(G120 P1) Function



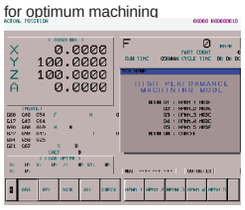
RECTANGULAR HOLE PATTERN
(G120 P4) Function



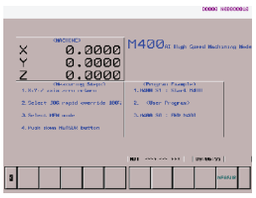
GRID HOLE PATTERN
(G120 P5) Function

Machining

High Performance Machining Mode M300
With 5 sets of parameter settings, the users choose the most suitable mode for optimum machining

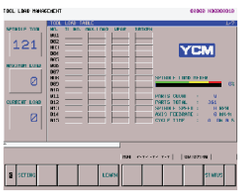


High Speed Machining Mode M400
Increases drilling and tapping speed, reduces machining time for job shop and precision mold machining

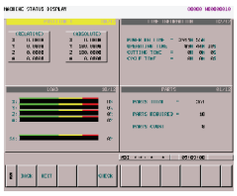


NEW

Tool Load Management
Instant tool load monitoring with alarm function

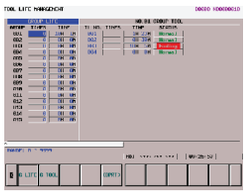


Multi-display Fuction
Displays 4 statuses simultaneously with configurable status display



NEW

Tool Life Management
Indicates tool status of each group with tool life alert

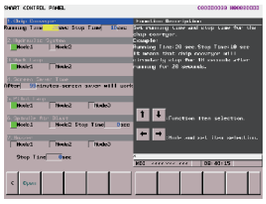


Instant Message Alert

Pop-up Alarm Display

Instantly provides troubleshooting procedure
Quick response to alarm

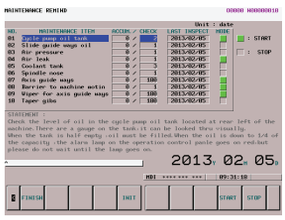
Smart control panel (iPANEL)



Easy to set up and operate important functions

Maintenance

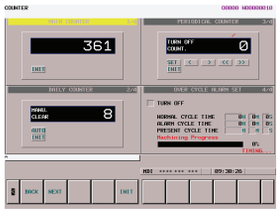
Intelligent Maintenance



Provide users with periodic maintenance options and descriptions

Instantly provide users
with maintenance notifications

Counter Function



Allow users to keep count of workpieces with the function of overtime cycle alarm provides easy control over machining cycle time

1. Main Counter
2. Periodical Counter
3. Daily Counter
4. Over Cycle Alarm

YCM® PRODUCT LINES

VMC — Vertical Machining Center

FP Series — *High Precision High Performance Die Mold Vertical Machining Center / High Precision Graphite Vertical Machining Center*
FP55LX, FP66A, FP100A / FP66G

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

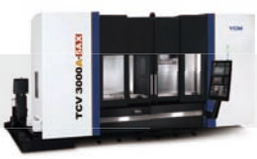
TV Series — *Heavy Duty Vertical Machining Center*
TV116B, TV146B, TV158B, TV188B, TV2110B, TV2610B, TV850B

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

NMV Series — *High Performance High Rigidity Vertical Machining Center*
NMV76A , NMV106 A

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

NFX Series — *High Performance 5-axis Vertical Machining Center*
NFX380A



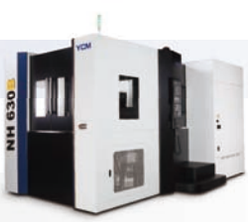
NSV Series — *Ultra High Performance Vertical Machining Center*
NSV66A, NSV102A, NSV102AM, NSV156A

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-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



H Series — *High Production Horizontal Machining Center*
H2612B

NH Series — *High Speed High Precision Horizontal Machining Center*
NH450A, NH630B, NH800B

HBM — Horizontal Boring Milling Machining Center

BMP Series — *High Accuracy Heavy Duty Boring Machine*
BMP1416B

CNC LATHES — CNC Turning Center

NT Series — *High Performance Mill/Turn Center*
NT-2000Y/SY, NT-2500Y/SY, NT-2000SY2

GT Series — *High Performance Geo Turning Center*
GT-200A/B/MA, GT-250A/B/MA/MB, GT-300A/B/LA/LB/MA/MB/LMA/LMB, GT-380A/B/LA/LB

TC Series — *High Performance High Precision CNC Lathe*
TC-16A/B/LA/LB/MA/MB/LMA/LMB, TC-26, TC-26L, TC-36, TC-36W, TC-46, TC-46M

NTC Series — *High Efficiency CNC Turning Center*
NTC-1600/M/Y/L/LM/LS/LY/LSY, NTC-2000/M/Y/L/LM/LS/LY/LSY

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