Heavy Duty Vertical Machining Center
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 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.
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.

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.

<table>
<thead>
<tr>
<th>Pallet Size</th>
<th>mm</th>
<th>inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pallet Size</td>
<td>1,200</td>
<td>560</td>
</tr>
<tr>
<td>Table Load Capacity</td>
<td>600</td>
<td>1,323</td>
</tr>
<tr>
<td>Table Surface to Floor</td>
<td>965</td>
<td>37.99</td>
</tr>
</tbody>
</table>
**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.
Standard gearhead spindle of maximum of 6,000rpm high-speed with the maximum of 15kW/18.5kW 25HP/20HP power output and 48kgf-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.
**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

<table>
<thead>
<tr>
<th>ACCURACY</th>
<th>ISO 10791-4</th>
<th>YCM*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial Travel</td>
<td>Full Length</td>
<td></td>
</tr>
<tr>
<td>Positioning (X/Y/Z) A</td>
<td>0.042 / 0.025 / 0.025mm</td>
<td>0.014 / 0.014 / 0.014mm</td>
</tr>
<tr>
<td>Repeatability (X/Y/Z) R</td>
<td>0.020 / 0.015 / 0.015mm</td>
<td>0.010 / 0.010 / 0.010mm</td>
</tr>
</tbody>
</table>

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

### TV146B ACCURACY

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<thead>
<tr>
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</tr>
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### Axial Rapid Feedrate

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16m/min.</td>
<td>630ipm</td>
<td>16m/min.</td>
</tr>
</tbody>
</table>

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**TV Series 116B**

**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.
- 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

<table>
<thead>
<tr>
<th></th>
<th>ISO 10791-4</th>
<th>YCM*</th>
</tr>
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<tr>
<td><strong>Axial Travel</strong></td>
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<td></td>
</tr>
<tr>
<td>Positioning (X/Y/Z) A</td>
<td>0.042 / 0.032 / 0.025mm</td>
<td>0.014 / 0.014 / 0.014mm</td>
</tr>
<tr>
<td>Repeatability (X/Y/Z) R</td>
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<td>0.010 / 0.010 / 0.010mm</td>
</tr>
</tbody>
</table>

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

### Axial Rapid Feedrate

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

<table>
<thead>
<tr>
<th>TV2110B / 2610B ACCURACY</th>
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<tbody>
<tr>
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<td>0.014 / 0.014 / 0.014mm</td>
</tr>
<tr>
<td></td>
<td>0.0017&quot; / 0.0013&quot; / 0.0010&quot;</td>
<td>0.0008&quot; / 0.0006&quot; / 0.0006&quot;</td>
</tr>
<tr>
<td>Repeatability (X/Y/Z) R</td>
<td>0.020 / 0.018 / 0.015mm</td>
<td>0.010 / 0.010 / 0.010mm</td>
</tr>
<tr>
<td></td>
<td>0.0008&quot; / 0.0007&quot; / 0.0006&quot;</td>
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### SPECIFICATIONS

#### Spindle
- **Spindle Speed (opt.)**: 6,000rpm (10,000rpm)
- **Spindle Power (opt.)**: 15/18.5kW (15.5/22kW) 20/25HP (25/30HP)
- **Spindle Taper (opt.)**: BT50 (BBT50)
- **Front Bearing Diameter**: ø100mm ø3.94"

#### Travel
- **X-axis Travel**: 1,200mm 43.31" 47.24" × 23.62" (47.24" × 22.05")
- **Y-axis Travel**: 1,500mm 59.06" 50.00" × 12.60" (50.00" × 12.00"
- **Z-axis Travel**: 1,800mm 70.87" 79.92" × 31.50" (79.92" × 31.00"
- **Distance Between Spindle Nose & Table Top (APC)**: 168~798mm (68~698mm)
- **Distance Between Spindle Z-axis Travel**: 630mm 24.8" 24.8" × 24.8"

#### Table
- **Table size (APC)**: 1,160 × 600mm (1,160 × 600mm)
- **T-Slots × Size × Pitch**: 5 × 18mm × 100mm 5 × 0.71" × 3.94"

#### Feedrate
- **Rapid Feedrate (X/Y/Z)**: 16/16/16 m/min. 0.04~196.9ipm
- **Cutting Feedrate**: 1~5,000 mm/min. 0.04~196.9ipm

#### ATC
- **Tool Magazine Capacity (opt.)**: 24T (32/40T)
- **Max. Tool Dimensions (opt.)**: ø110mm × 350mm ø4.33" × 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)

#### Accessories

<table>
<thead>
<tr>
<th>Tool Kit</th>
<th>Work Lamp</th>
<th>Pilot Lamp</th>
<th>Optical Scale</th>
<th>Gear Box</th>
<th>Foundation Bolts</th>
<th>Coolant Equipment System</th>
<th>Oil Skimmer</th>
<th>Coolant Gun</th>
<th>Spindle Air Blast</th>
<th>Cutting Air Blast</th>
<th>Oil-Hole Holder Function</th>
<th>Automatic Power Off System</th>
<th>Oil Mist Coolant System</th>
<th>Chip Enclosure (w/ Top Cover)</th>
<th>Chip Enclosure (w/o Top Cover)</th>
<th>APC</th>
<th>Leveling Blocks</th>
<th>Central Automatic Lubrication System</th>
</tr>
</thead>
<tbody>
<tr>
<td>116</td>
<td>146</td>
<td>158</td>
<td>168</td>
<td>2110</td>
<td>2610</td>
<td></td>
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</table>
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.
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

Programming

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

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

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

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

Smart control panel (IPANEL)
Easy to set up and operate important functions

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

Tool Load Management
Instant tool load monitoring with alarm function

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

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

CIRCULAR HOLE PATTERN (G120 P1) Function
RECTANGULAR HOLE PATTERN (G120 P4) Function
GRID HOLE PATTERN (G120 P5) Function

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**Vertical Machining Center**

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

- **NXV Series**
  - High Performance Vertical Machining Center
  - NXV550A, NXV1020A, NXV1380A, NXV1680A

- **TV Series**
  - High Efficiency T-base Vertical Machining Center
  - TV116B, TV146B, TV158B, TV188B, TV2110B, TV2610B, TV580B

- **NTV Series**
  - NTV158B

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

- **WV Series**
  - Ultra Wide High Performance Vertical Machining Center
  - WV108A

- **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

- **DCV Series**
  - Advanced Double Column Vertical Machining Center
  - DCV2012A, DCV3016B-6030B, DCV2018A-5AF, DCV4030B-6030B-5AF, DCV4030B-5AF

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

**Horizontal Machining Center**

- **H Series**
  - High Production Horizontal Machining Center
  - H2612B

- **NH Series**
  - High Speed High Precision Horizontal Machining Center
  - NH450A, NH630A, NH800A

**Horizontal Boring Milling Machining Center**

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

**CNC Turning Center**

- **NT Series**
  - High Performance Mill/Turn Center
  - NT-2000YSY, NT-2500YSY, NT-2000SY2

- **GT Series**
  - High Performance Gao Turning Center
  - GT-200FAA, GT-250FPAMBM, GT-300FBLAAMBM, MAAMBM, GT-380FAFAJL

- **TC Series**
  - High Performance High Precision CNC Lathe

- **NTC Series**
  - High Efficiency CNC Turning Center
  - NTC-1600FVFLMFLM5LYLSY, NTC-2000FVFLMFLM5LYLSY

**Integrated Operation Control System**

- Spindle Thermal Compensation System
- Remote Monitoring System
- Automation Solutions

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** YEONG CHIN MACHINERY INDUSTRIES CO., LTD.**

No. 888, Sec. 1, Homu Road, Shengang District, Taichung 42953, Taiwan

Tel: +886-4-2562-3211  Fax: +886-4-2562-6479

Web Page: www.YCMCNC.com  Email: sales@YCMCNC.com