

Pinnacle



Pinnacle Machine Tool Co., Ltd.

No.35, Aly. 15, Ln. 330, Shenzhou Rd.,
Shengang Dist., Taichung City 42949, Taiwan
TEL:886-4-25252995
FAX:886-4-25252991
E-mail:info@pinnacle-mc.com
<http://www.pinnacle-mc.com>

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High-Tech Expertise in
5-axis machining
Strategies for success in cutting edge technology



CE EMC



Pinnacle
"exceeds your expectation".

WIDE PRODUCT RANGE

Pinnacle Machine Tool Co., Ltd. was founded in 1976. With excellent experience in **Technology, Quality & Service**; we are specialized in manufacturing all kinds of machining centers such as 5-axis, double column, vertical, and horizontal. Furthermore, we have a wide range of CNC lathes as well. The complete product lines with outstanding quality satisfy the needs of our valuable customers worldwide.

STRONG TECHNICAL SUPPORT & AFTER SERVICE

R&D is teamed up by experienced engineers with decades of expertise in machine tool industry. By means of applying up-to-date technologies such as CAD/CAM/CAE software and Finite Element Analysis, our machines are robustly constructed, assuring optimum rigidity and stability. Our reliable partnerships with dealers keep us connected closely with the latest technologies and market trends, hence ensuring Pinnacle product developments are upgraded constantly.

Well-trained service engineers are familiar with each step of assembly to ensure our quality service works and keep all machines running in the best status. Training courses to service engineers are held periodically to keep the team refreshed with the latest technology and skills.

Pinnacle's reputation is built on quality; it relies on an excellent quality control system and systematic management. The in-coming parts are inspected under highest standard by using precision equipments during production, assembly and final test run processes.

The sales and service departments provide customers pre-sale and after-sale services. Prompt reaction is just our basic attitude to all customers only, accurate and effective technical solutions are provided within the shortest time.

"Pinnacle Assembly Line"



Flexible application on robust structure
Simple and compact design
to solve your most complicated machining jobs.



High-Tech Expertise in 5-axis Machining

5-AXIS MACHINING CENTER

The main components are made from high quality Meehanite cast iron, which are annealed and stress-relieved before machining. The spindle with entire headstock assembly is counter-balanced by pneumatic system to minimize the column and headstock vibration during acceleration / deceleration. The 5-axis synchronized machining allows complicated work pieces to be finished in just one setup, and it increases machining efficiency and accuracy, also reduces machine idle time. Pinnacle AX 320 / AX 450 are your best choice for producing aerospace components, medical equipment and any parts with multiple curved faces.

AX320

- 660 x 610 x 610mm Travel
- A Axis Tilt 150° (-120°+30°)
- C Axis Rotary 360°
- Rapid Feedrate 30/30/24 m/min
- 9/12 Kw Spindle Motor
- ISO40 Spindle Taper
- X, Y & Z Axis Linear Roller Guideway



Each Pinnacle machine is subject to dynamic and static accuracy tests. Pinnacle machine accuracy meets ISO 10791 VDI 3441, ISO 230, JIS B6388 and ASMEB5 standards.

AX450

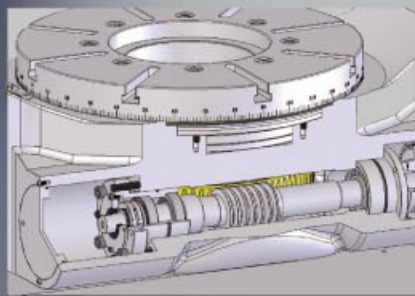
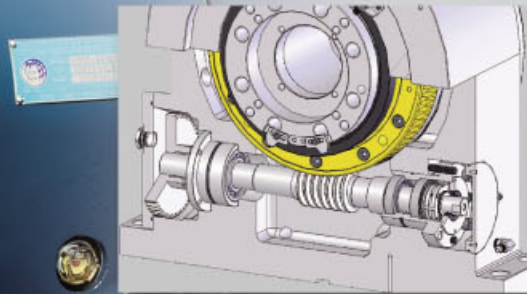
- 760 x 610 x 560mm Travel
- A Axis Tilt 220° (±110°)
- C Axis Rotary 360°
- Rapid Feedrate 30/30/24 m/min
- 9/12 Kw Spindle Motor
- ISO40 Spindle Taper
- X, Y & Z Axis Linear Roller Guideway

High-Tech Expertise in 5-axis Rotary Table

C-AXIS
360°

A-AXIS
±110°

- Rotary Table diameter Ø320/Ø450mm
- Table rotation and tilting are driven by servo motor
- Positioning accuracy, A/C-axis: 15" / 10"
- Repeatability accuracy, A/C-axis: 10" / 5"



3 + 2 = ∞ Infinite Solutions

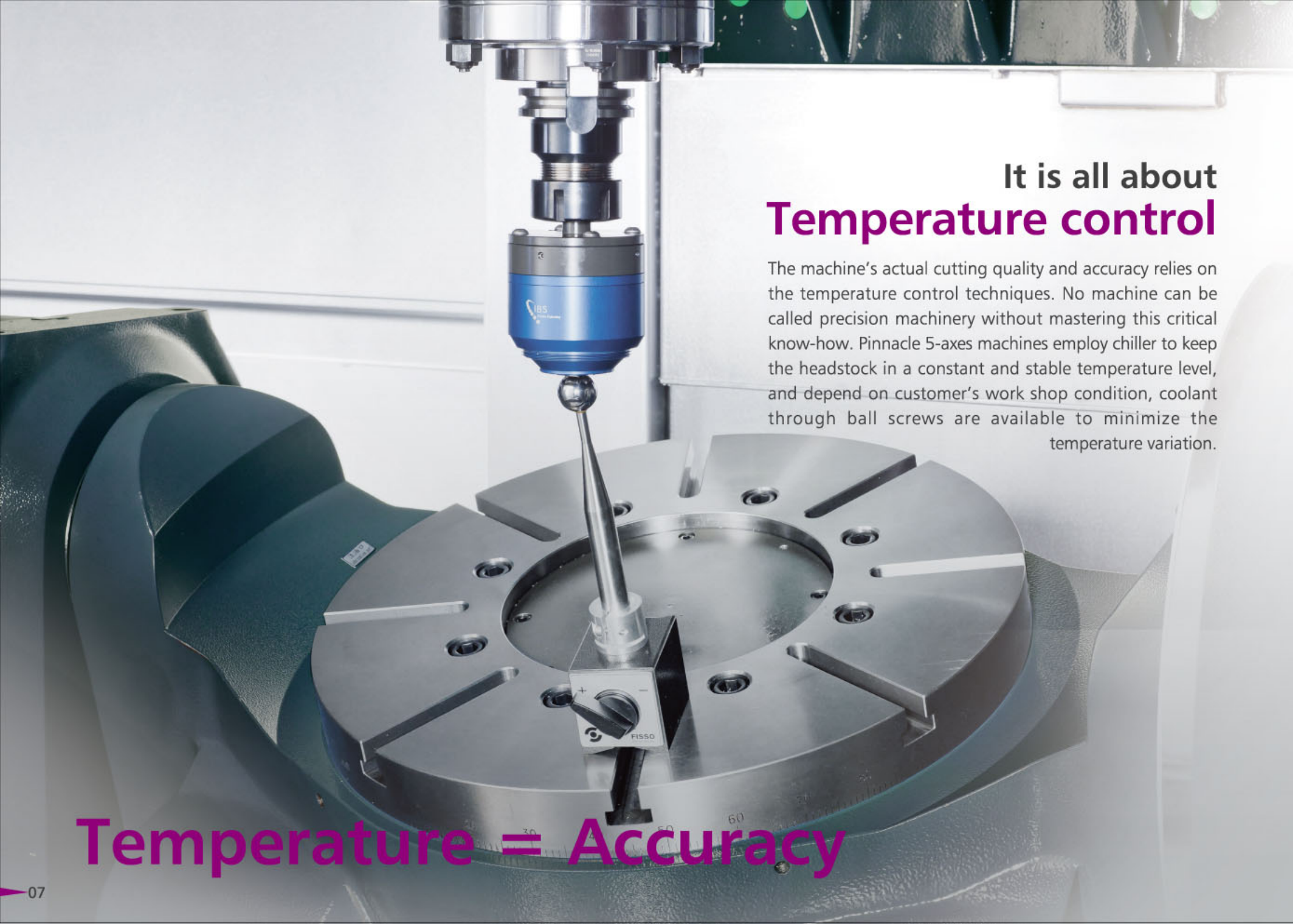
Rigid • Stable • Accurate

3 linear axes X/Y/Z plus rotary and tilting axes A/C offers almost infinite solutions to your 5-axis or multiple faces machining jobs. The two-in-one rotary/tilting table features easy maintenance and low service cost.

AX320 A-axis swivels 150° and AX450 swivels 220° to optimize machining space and allows complex workpieces to be finished in just one setup and reducing cycle time.

Robust Structure
ensures long term accuracy,
year after year.



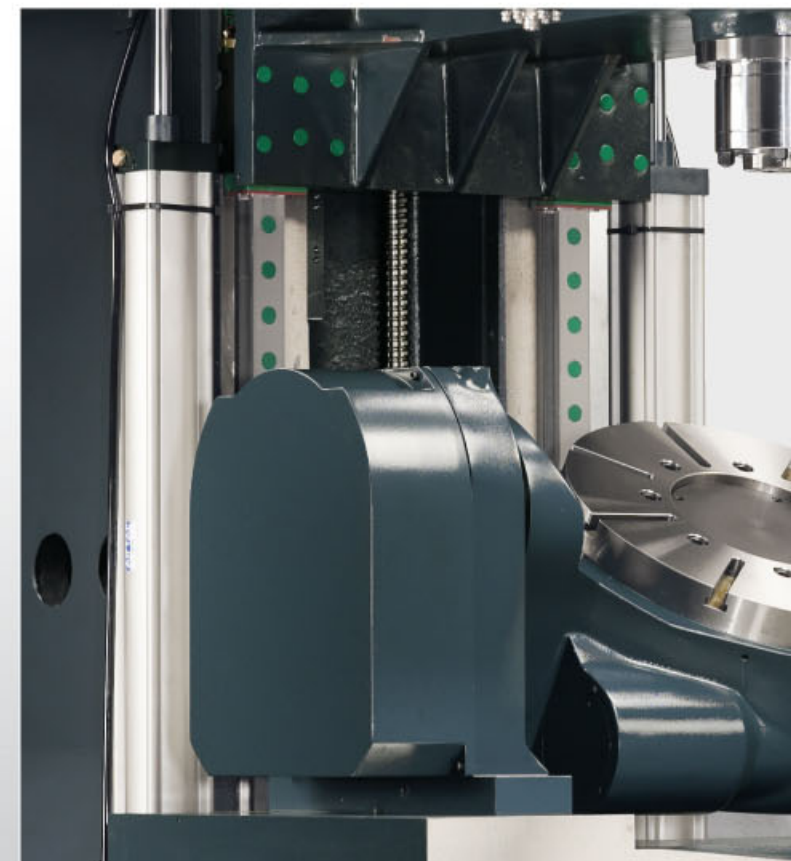


It is all about Temperature control

The machine's actual cutting quality and accuracy relies on the temperature control techniques. No machine can be called precision machinery without mastering this critical know-how. Pinnacle 5-axes machines employ chiller to keep the headstock in a constant and stable temperature level, and depend on customer's work shop condition, coolant through ball screws are available to minimize the temperature variation.

Temperature = Accuracy

Outstanding craftsmanship



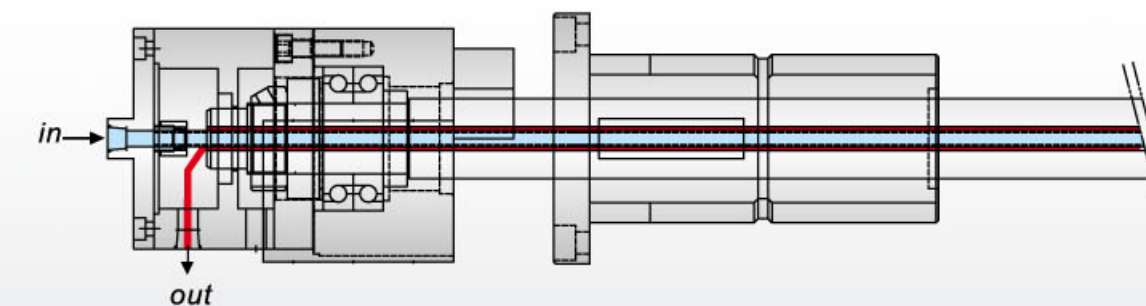
Pneumatic Balance System

The Z-axis is pneumatic counter-balanced via high response pneumatic cylinders. Plus an air reservoir tank to boost the balancing performance, ensuring fast and stable Z-axis movement, giving high surface finish.

Cooling System to Spindle

The spindle oil cooler permits the spindle to keep a constant temperature running and ensures long service life. It also provides high efficiency machining and high accuracy.

Hollow Ball Screw with Cooling System



Oil cooling through ball screws on X, Y, Z axis minimizes thermal deformation and backlash, while ensuring smooth motion during rapid traverse.



Linear Roller Guideway

X/Y/Z axes adopt roller guideways for optimum rigidity and speed. 6 rolling shoes on X/Z axes minimize damping effect.

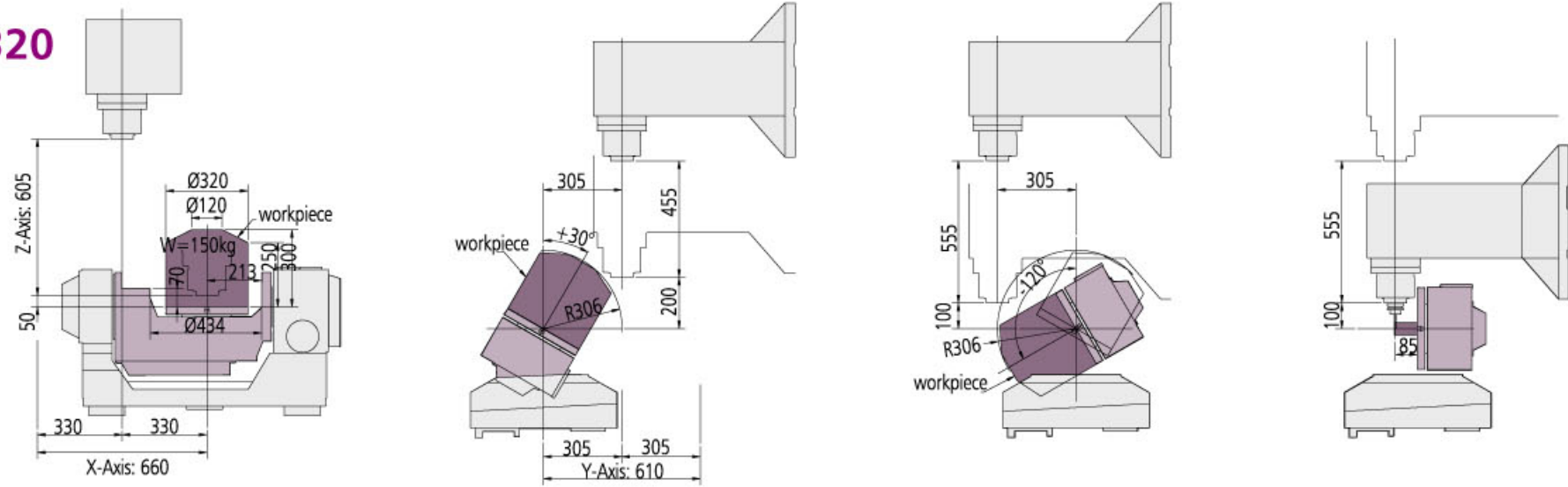


Rigid Machine Base and Saddle

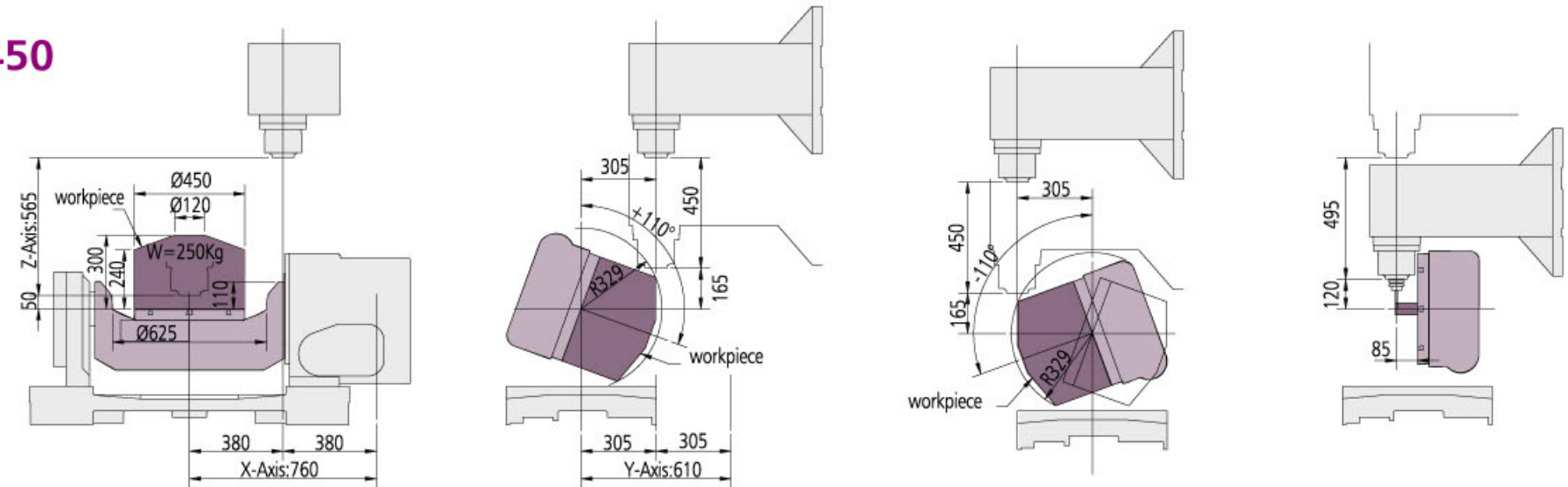
Drive motors direct coupled with pretensioned and oversized ballscrews to ensure cutting quality.

WORKING CAPACITY

AX320



AX450



discovery II

Quality is not a job,
it is our attitude.



ISO certification



CE certification

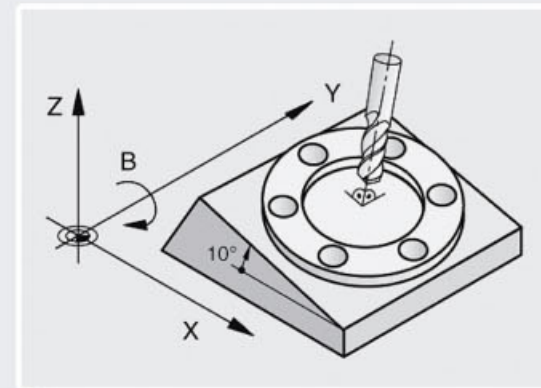


All Aspect Quality System

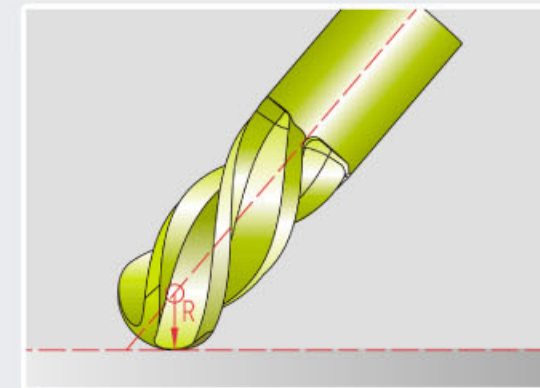
Quality comes not from inspection but from every Pinnacle staffs' mentality. The state-of-the-art inspection equipments only help us to prove our attitude and accuracy results.



PLANE Function
The PLANE feature makes it easy to define a tilted working plane.



Tilting the Working Plane
With Cycle 19 with swivel heads or tilting tables, you program the operation as usual in the working plane, for example in X/Y. The machine runs the program in a plane that has been tilted by one or more rotary axes with respect to the main plane.

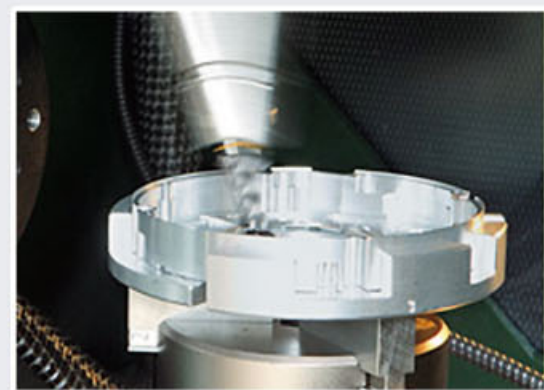


TCPM function (Tool Center Point Management)
In five-axis operations, TCPM function to move the tool reliably on the contour and ensure that the work surface is not damaged. Maintain the position of the tool tip when positioning with tilted axes. With the aid of the TCPM function, the iTNC 530 automatically corrects the tool path for the machine geometry and the tool length as well as compensates the tool radius in three dimensions.



Chip Flushing System
Chip flushing system is equipped to remove cutting chips inside of enclosure, which prevents chip accumulation and any possible damage to the linear guideways and ball screws.

CNC CONTROLLER SYSTEM
AX series is high speed, high accuracy with HEIDENHAIN iTNC530 5-axis simultaneously controlled machining center. Equips 10000rpm direct drive spindle, or optional 15000rpm built-in spindle.



DCM (Dynamic Collision Monitoring)
DCM enables you to check for collisions in the test run mode before actually machining a part. To avoiding machine down times. Simulation for a safety process.



Coolant Through Spindle (Option)
20 Bar high pressure pump and sub tank assure CTS system offers the highest efficiency of chip disposal.



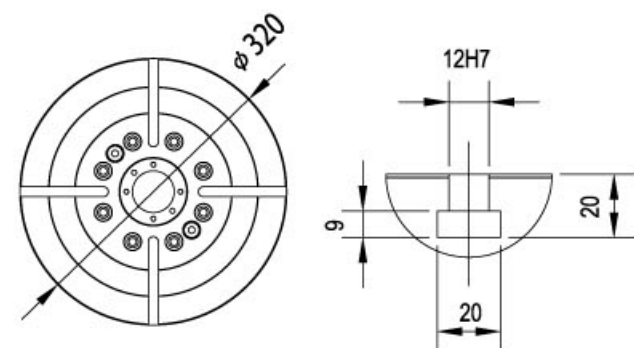
Chip Conveyor (Option)
Hinge type or scraper type chip conveyor in front side of machine (able head to left or right) removes chips from machine.



Kinematic Opt. (Option)
Kinematics Opt is an important component to help you meet these high requirements: With a HEIDENHAIN touch probe inserted, a 3-D touch probe cycle measures your machine's rotary axes fully automatically. The results of measurement are the same, regardless of whether the axis is a rotary table, a tilting table or a swivel head.

■ FLOOR SPACE:

TABLE SIZE: AX320



FLOOR SPACE: AX320

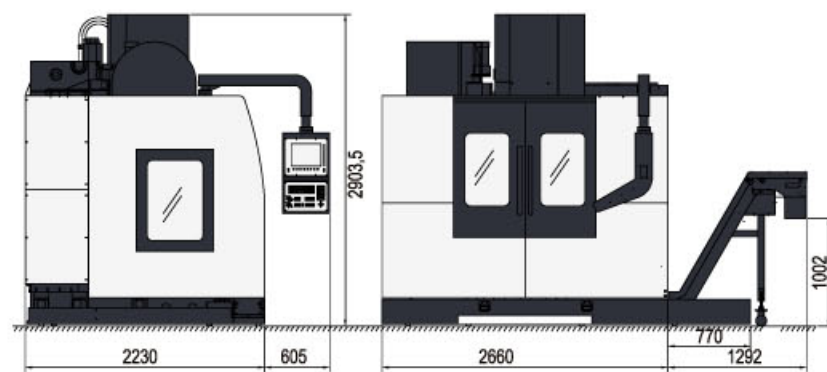
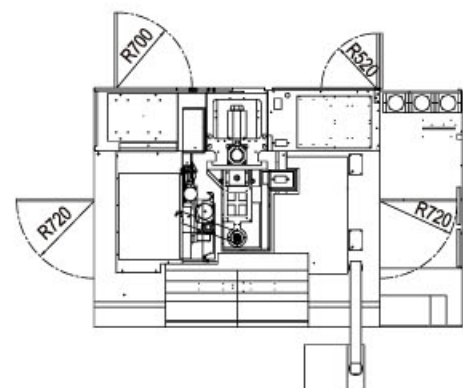


TABLE SIZE: AX450

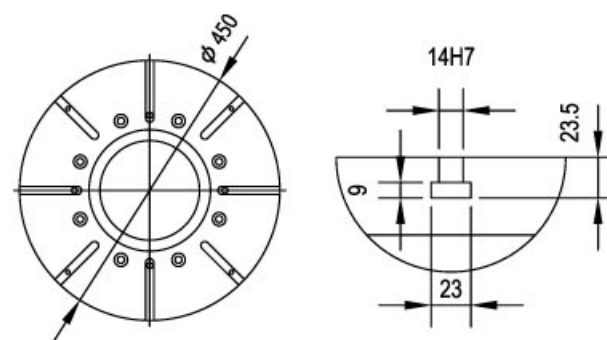
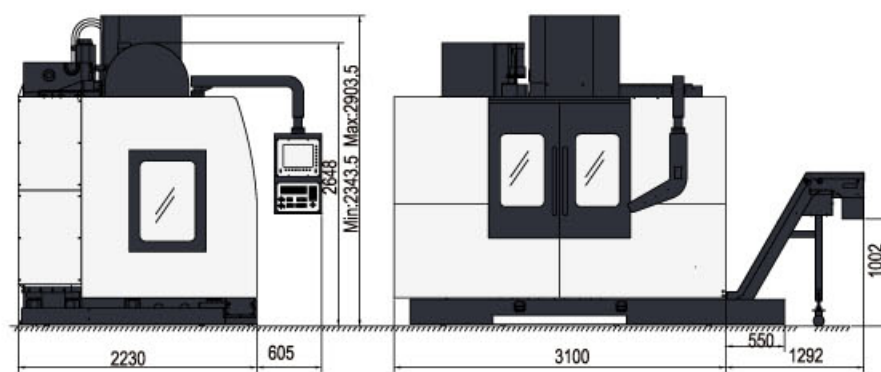
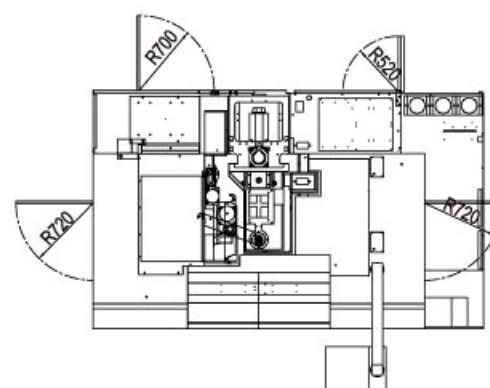


TABLE SIZE: AX450



■ SPECIFICATIONS:

MODEL	AX320	AX450
TABLE		
Table Size (mm)	Ø320	Ø450
Travel Ranges (X / Y / Z mm)	660 x 610 x 610	760 x 610 x 560
T Slot Size (Size x deg)	12 x 90	14 x 45
Max. Table Load (0° / 90°g)	150 / 150	300 / 250
Max. Workpiece Size (W x H mm)	Ø420 x 300	Ø600 x 300
Diameter of Table Hole (mm)	Ø50	Ø171
Spindle Nose to Table Surface (mm)	50~605	50~565
A Axis, Tilt (deg) / (0.001°)	150° (-120° / +30°)	220° (±110°)
C Axis, Rotary (deg) / (0.001°)	360°	360°
SPINDLE		
Tool Shank & Pull Stud	ISO40	ISO40
Spindle Inner Diameter (mm)	Ø70	Ø70
Spindle Speed (rpm) Direct drive	10000 (12000)	10000 (12000)
Spindle Speed (rpm) Built-in	15000	15000
Main Motor (con./30min kW)	9 / 12	9 / 12
AXIS SERVO MOTOR		
Rapid Feed Rate (X / Y / Z m/min)	30 / 30 / 24	30 / 30 / 24
Feed Rate (X / Y / Z m/min)	10	10
Feed Rate (A / C rev/min)	5.5 / 11.5	5.5 / 11.5
X Axis Rated Torque (Nm)	10	10
Y Axis Rated Torque (Nm)	10	10
Z Axis Rated Torque (Nm)	10	10
A Axis Rated Torque (Nm)	5	10
C Axis Rated Torque (Nm)	3.8	10
AUTO TOOL CHANGER		
ATC Type	Disk - 24, 30 (Chain - 40)	Disk - 24, 30 (Chain - 40)
Cam Type	Arm	Arm
Tool selection (Bi-Direction)	Random	Random
Tool Storage Capacity (Pcs)	24 (30,40)	24 (30,40)
Max. Tool Diameter (mm)	90 (76)	90 (76)
Max. Tool Length	300	300
Max. Tool Weight	8	8
MISCELLANEOUS		
Air Requirement (Kg/cm ²)	6	6
Hydraulic Requirement (Kg/cm ² , L)	40, 30 L	40, 30 L
Voltage	380	380
Power Requirement (KVA)	40	40
Coolant Tank Capacity (L)	300	300
Machine Weight (KGs)	6500	7000
Machine Height (mm)	2900	2900
Floor Space (L x W mm)	2660 x 2230	3100 x 2230
Packing Size (L x W x H mm)	2660 x 2230 x 2560	3100 x 2230 x 2560

● ALL SPECIFICATIONS AND DESIGNS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

■ Standard Accessories:

- Air Blast Through Spindle
- Air Blast for Workpiece (nose)
- Coolant Flushing System
- 3 Axes Telescopic Covers
- Full Splash Guard
- Automatic Lubrication System
- Working Lamp
- Operation Status Light
- Arm Type 24-tool ATC
- Z Axis Pneumatic Balance System
- Cooling System
- Air Gun/Water Gun
- MPG Handwheel
- Heat Exchanger
- RS-232 Interface
- Rigid Tapping
- Spindle Oil Cooler
- Hollow Ball Screws with Cooling System
- A-axis Rotary Encoder
- C-axis Rotary Encoder
- Adjusting Tools and Box
- Leveling Bolts and Pads
- Operation and Programming Manual

■ Options:

- Transformer
- Chain Type Chip Conveyor
- Coolant Through Spindle
- 3 Axes Linear Scales
- Auto Tool Length Measurement
- Auto Workpiece Measurement
- FANUC Controller
- MITSUBISHI Controller
- SIEMENS Controller