



L.K Machinery Corp.



A **Global**
MACHINING CENTER MANUFACTURER



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CE ISO 9001



All new

TAPPING CENTER

*The Combination of Efficiency and Reliability
LK High Speed Tapping Center Series*

- Ultra compact High Speed CNC Tapping Center
- Over 6000 sets field tested by world's largest mobile phone brands
- A Tapping Center known for Best Value
- Taiwan's largest exporter for Tapping Centers

Built with Passion for Quality and Efficiency

LK Tapping Center Series is engineered for quality mass production with extraordinary yield rate. Led by a Seasoned Machining Center Design Expert, all LK Tapping Centers are designed for accuracy and reliability.

TC-510



TC-710

Unmatched Productivity

From structural analysis to actual metal cutting, each Tapping Center produced by LK, displays the optimum performance that meets your most rigorous demands.

Speed is Everything



The 3 axes' motors are direct coupled with servo motors. The backlash-free design powers the axial motion to its optimum level, featuring no noise, low temperature rise and the high accuracy.



For every high productivity workshop, every second counts. To reach the maximum cutting performance, LK TC series machine employs a low inertia spindle motor* featuring high torque output during low speed range, as well as high acceleration/deceleration output, to reduce tapping time a minimum.

Spindle Acc/Dec from 0 - 15000 rpm: 1.4 Sec.

*Optional



TC-1200



Two Machines in One

The design of traveling column TC-1200 allows two separate working areas that function the same as a pallet changer, or alternatively a large long work piece can be machined in one setup.

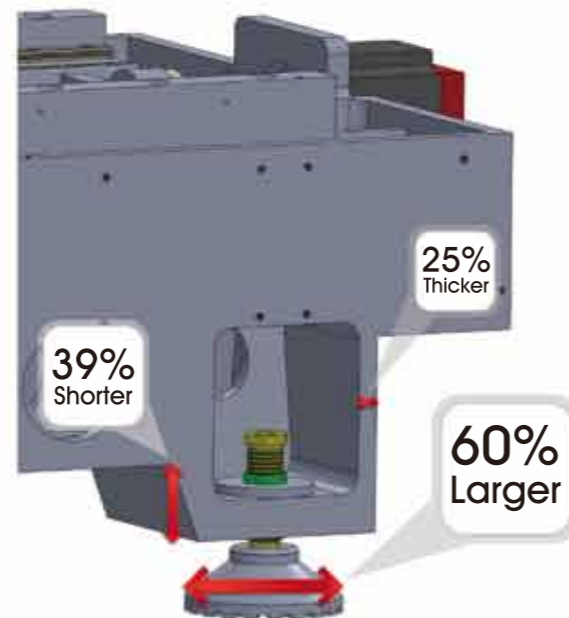
Wide Application Range

The powerful performance of LK Tapping Centers is widely applied in automobile, computer, communication electronics, watch, jewelry, aerospace and medical equipment industries.

Enlarged Foundation Block and Strengthened Machine Base



LK engineering team focuses on every small detail to optimize machine's rigidity and reliability.

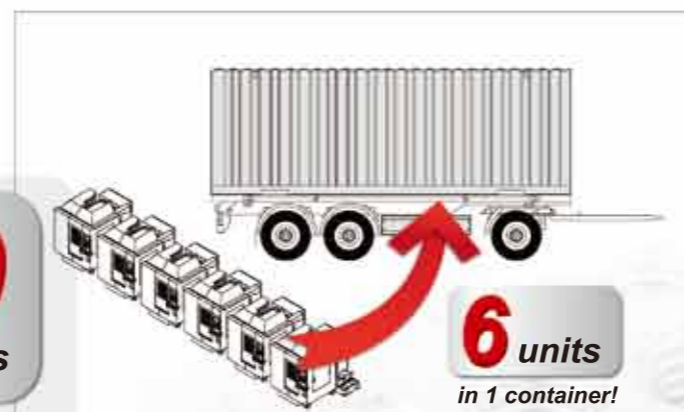


Maximum Cutting Area with Minimum Floor Space Required



50
machines

5000 ft²!

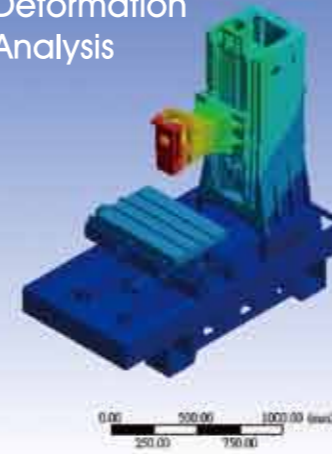


6 units
in 1 container!

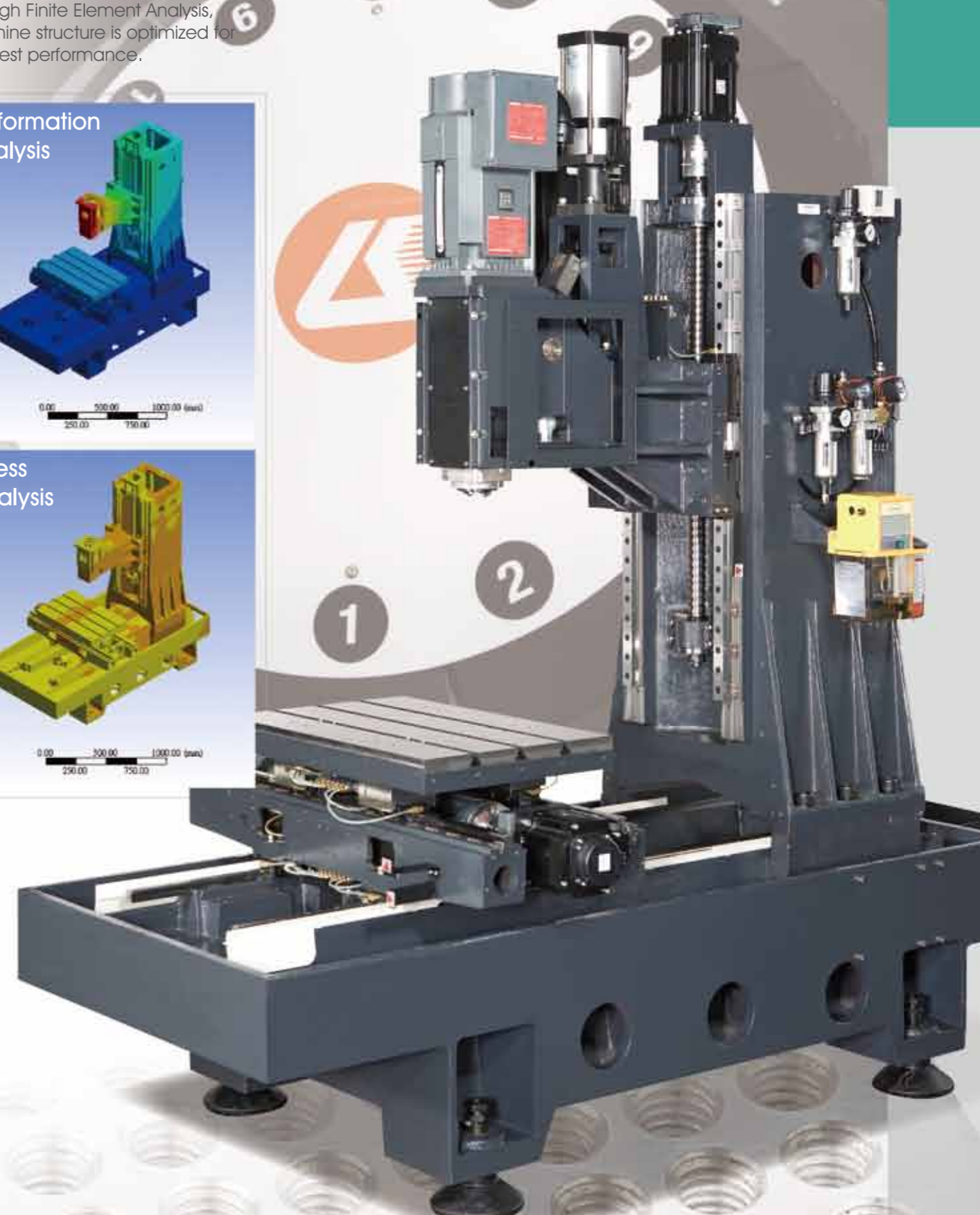
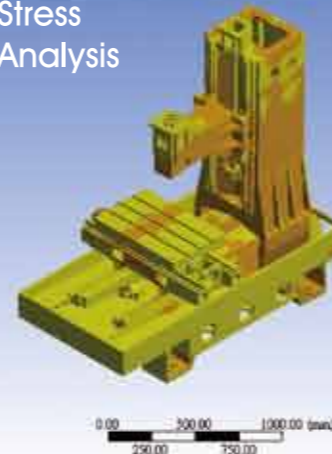
FEA Design

Through Finite Element Analysis, machine structure is optimized for the best performance.

Deformation Analysis



Stress Analysis





Spindle Vibration Test in Y Direction



No-Counter Balance Design

An oversized Z Axis motor, direct coupled with ball screw, eliminates the need to have a mechanical counter balance. This design produces better surface finishes so best cutting surface finish can be achieved.



Smooth Motion

Linear motion guideways and pre-tensioned ball screws on X/Y/Z axes are installed to deliver more torque and thrust, featuring low thermo deformation and high dynamic positioning accuracy.

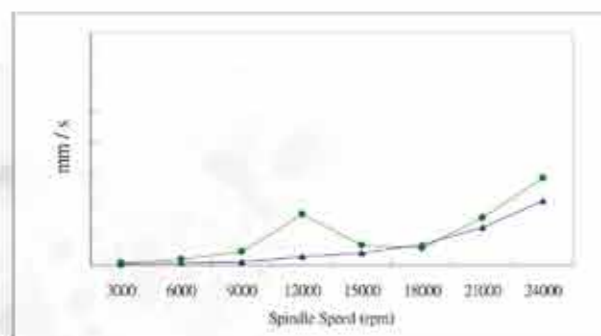


Z Axis Flexible Cover

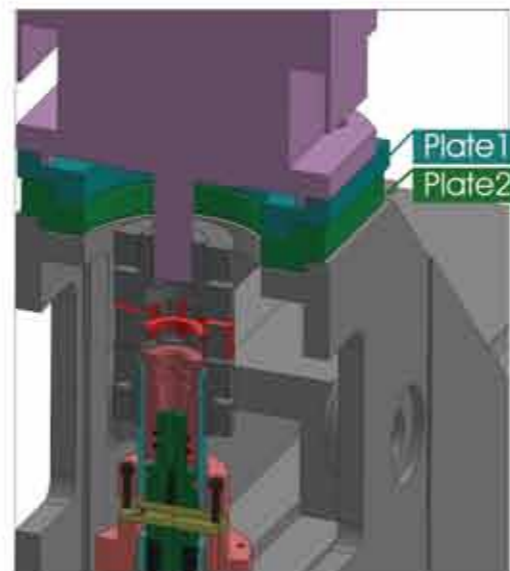
The telescopic covers on 3 axes are specially designed to protect ball screws and linear guideways under the high rapid traverse of max. 48 (to 60 M/min)(opt.) per minute.

Better Concentricity Between Motor Shaft and Spindle

LK's two-plate spindle motor seat design adds more adjustment with lower tolerances. This produces better concentricity between the motor shaft and spindle, Reducing vibration and improving over all performance.



▲ Vibration of two plate ● Vibration of Single plate



Reliable ATC Unit

TC-510/710 is standard equipped with Turret type ATC; while TC-1200 is fitted with Arm Type.

The Turret Type ATC provides rapid tool change time of 1.7 and Arm Type (Servo) 1.2 second (opt.) with impeccable reliability, suitable for high productivity 7/24 operation.



Design and mechanism tested over

400,000 times.

Rear Chip Disposal

Cutting chips are efficiently conveyed to the rear side of machine with large flow coolant, and with the lift-up type chip conveyor (optional), chip removal is reliable and efficient.

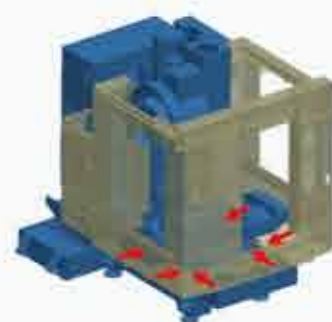
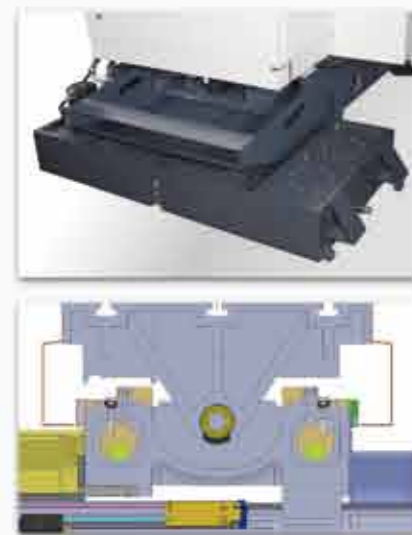


Chips

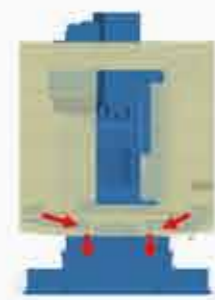
Removing cutting chips efficiently from the cutting area is part of a critical know-how concerning stable long time operation. LK understands the importance of this issue, and designs the machine with various chip flushing / conveying mechanism to meet the demands.

Complete Chip Protection

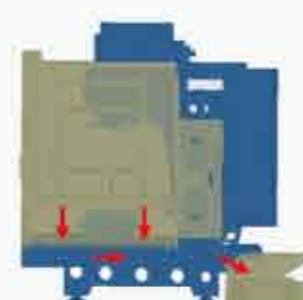
Our new generation telescopic cover effectively prevents the ingress of chips from entering the 3 axes transmission structure.



Isometric view



Front view



Right view

Automation



Right Angle / Universal Milling Head

For additional machining versatility, the Right Angle Milling Head / Universal Milling Head is capable of boosting high efficiency and accuracy especially for complicated workpieces. The Multi-purposes purposes milling head does not require any changes to the machine structure, it is suitable for auto parts, mold making and aerospace industry.



Auto Vise

Suitable for mass production processes, the Auto Vise features rapid workpiece clamping and unclamping. The adjustable clamping force prevents thin workpieces from collapsing due to improperly applied clamping force. The PLC-controlled vise is suitable for mass production jobs such as forged components, various hardware and automobile parts.



4th / 5th Rotary Table

Featuring high accuracy and high efficiency, the complicated or multiple-face workpieces can be finished in one setup by using a 4+1 axis Rotary Table. The market demand for diverse high accuracy and complicated parts is growing rapidly, the accumulation of machining tolerance must be reduced to the minimum, thus the 4+1 axis Rotary Table is the answer to the high value-added machining demands.



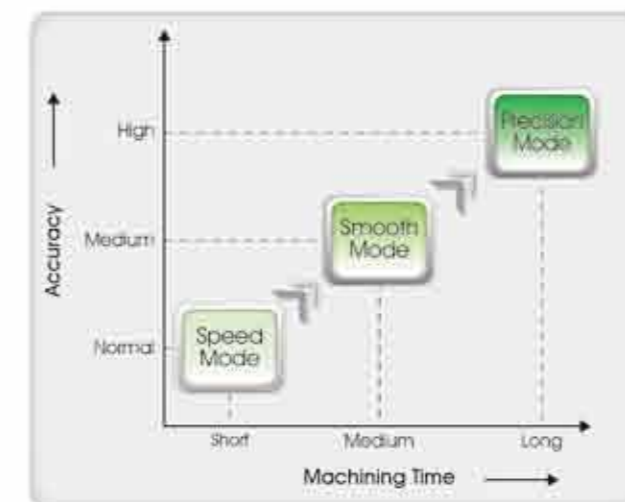
Robot:

The industrial Robot is the best solution for handling high frequency loading / unloading jobs. In combination with automatic vacuum fixtures, the performance of robots reach their maximum cost-performance ratio, which is suitable for high volume production applications



Custom Parameter Package Setting for Multiple Machining Modes

The CNC system offers 3 customer defined cutting modes. With these modes, proven motion control cutting parameters can be recalled from a standard library.

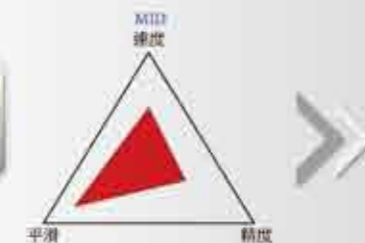


These user friendly controller functions allow customers to switch jobs without the need to change numerous motion control's system parameters.



Speed Mode: More Speed, Less Time

Suitable for:
Automobile / Motorcycle parts
Machinery components
Aluminum Parts
Smart phone cases
Work pieces of mass production



Smooth Mode: Balance of Speed and Time

Suitable for:
Optical electronics
Forging molds
Glass molds
Shoe molds
Work pieces that require good surface finishes



Accuracy Mode: Extremely High Precision

Suitable for:
Medical equipments
Aerospace parts
Semi-conductor related parts
5-axis machining
All hard milling parts

| | Surface Finish | Time | Curve Accuracy (Radius Tolerance) |
|---------------|----------------|--------|-----------------------------------|
| First | Rough | Fast | 0.101 mm |
| Mid | Medium | Medium | 0.059 mm |
| Finish | Excellent | Slow | 0.005 mm |

Cutting Performance

LK Tapping Centers feature extraordinary cutting capability. Via multiple parameter settings from the CNC, the work piece can be made according to the most demanding jobs.



DRILLING CAPACITY - 1

| | |
|------------------------------|-----------------------|
| Average Tact Time / Per Hole | 1.52 Sec. |
| Tool | Ø 0.5 mm Drill |
| Material | AL 6061 S45C |
| Spindle Speed | 16000 rpm 9600 rpm |
| Feedrate | 380 mm/min. 170mm/min |
| Depth | 4 mm 4mm |



DRILLING CAPACITY - 2

| | |
|------------------------------|-------------------------|
| Average Tact Time / Per Hole | |
| Tool | Ø 20 mm Drill |
| Material | AL 6061 S45C |
| Spindle Speed | 810 rpm 500 rpm |
| Feedrate | 410 mm/min. 200 mm/min. |
| Depth | 30 mm 30 mm |



TAPPING CAPACITY - 1

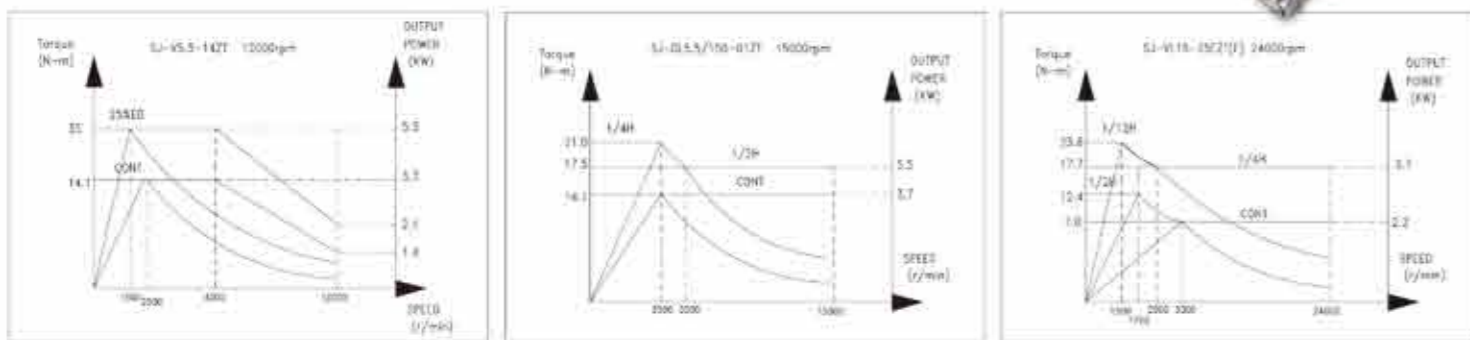
| | |
|------------------------------|--------------------------|
| Average Tact Time / Per Hole | 2.2 Sec. |
| Tool | M1 X P0.25 Tap |
| Material | AL 6061 S45C |
| Spindle Speed | 6000 rpm 2000 rpm |
| Feedrate | 1500 mm/min. 500 mm/min. |
| Depth | 6 mm 6 mm |



TAPPING CAPACITY - 2

| | |
|------------------------------|--------------------------|
| Average Tact Time / Per Hole | |
| Tool | M18 X P2.5 Tap |
| Material | AL 6061 S45C |
| Spindle Speed | 400 rpm 300 rpm |
| Feedrate | 1000 mm/min. 750 mm/min. |
| Depth | 30 mm 30 mm |

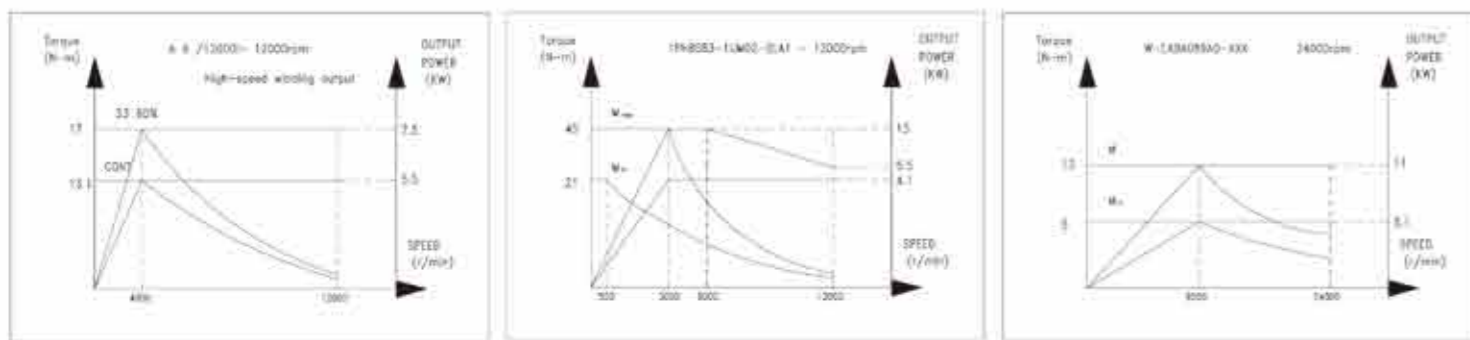
Power Chart



Mitsubishi

Mitsubishi

Mitsubishi



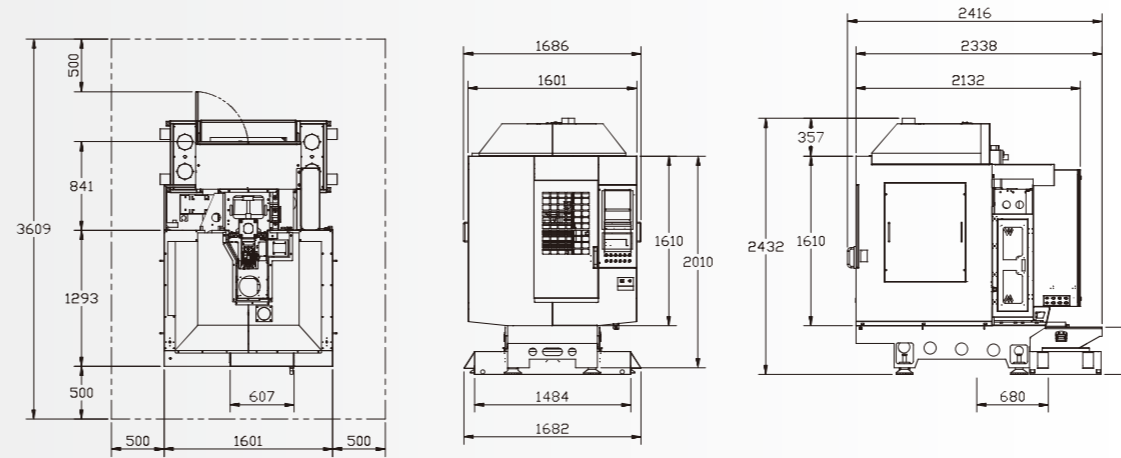
Fanuc

Siemens

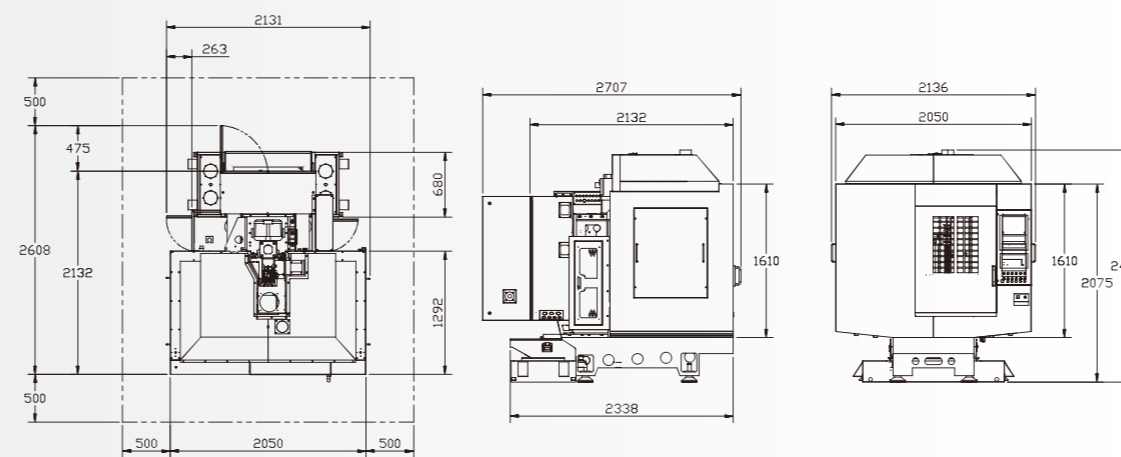
Siemens

Floor space

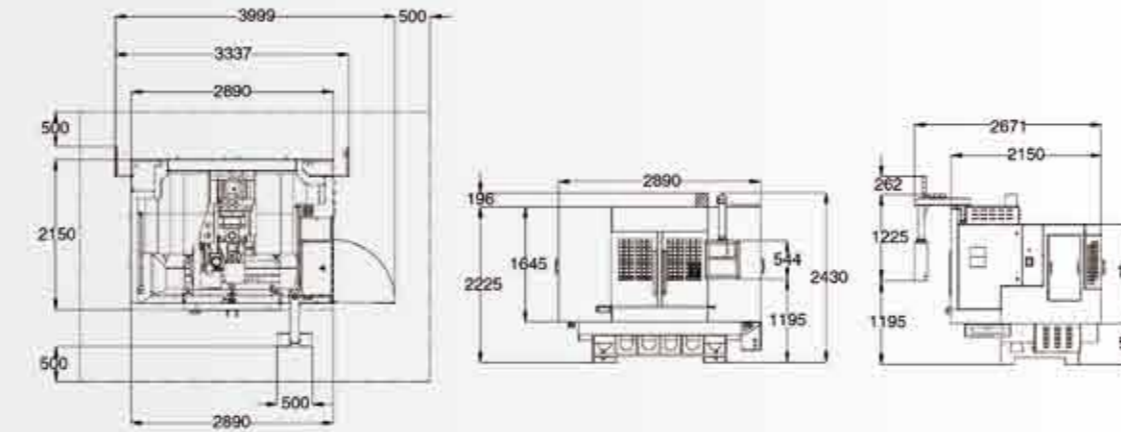
TC-510



TC-710



TC-1200



LASER INSPECTION
All 3 ball screws are Laser inspected. The backlash thoroughly checked and automatically compensated by the CNC, enhancing the maximum positioning as well as repeatability accuracy of the machine.



BALL BAR TEST
For machine's overall geometric accuracy, the Ball Bar Test is conducted on every machines to ensure the optimum cutting performance in roundness, squareness, concentricity, parallelism, and perpendicularity.



Roundness: 4.5 μm

SPECIFICATIONS

| Item/Model | Unit | TC-510 | | TC-710 | | TC-1200 | |
|---|---------------------------|--|-----------------------|--|-----------|-----------------------------------|-----------|
| 3 Axes Travel | | | | | | | |
| X-axis Travel | mm(inch) | 510 (20.1) | 710 (28) | 410/1200 (16.1x47.2) | | | |
| Y-axis Travel | mm(inch) | 420 (16.5) | 420 (16.5) | 410 (16.1) | | | |
| Z-axis Travel | mm(inch) | 350 (13.8) | 350 (13.8) | 420 (16.5) | | | |
| Distance From Spindle Center To Table Surface | mm(inch) | 180-530 (7.1-20.9) | 180-530 (7.1-20.9) | 200-620 (7.9x24) | | | |
| Spindle | | | | | | | |
| Spindle Speed | rpm | Direct Driven 12,000 (M.S) | | Direct Driven 12,000 (M.S) | | Direct Driven 10,000 | |
| Spindle Nose | BT | BT-30 | | BT-30 | | BT-30 | |
| Spindle Motor (Continual / 30 min) | kw(hp) | 3.7/5.5 (5/7.3) | 3.7/5.5 (5/7.3) | 5.5/7.5 (7.3/10) | | | |
| Table | | | | | | | |
| Table Size | mm(inch) | 650x420 (25.6x16.5) | 850x420 (33.5x16.5) | 410x1350 (16.1x53.1) | | | |
| T-slot Size | mm(inch) | 14x3x100 (0.55x3x3.9) | 14x3x100 (0.55x3x3.9) | 14x3x100 (0.55x3x3.9) | | | |
| Max Table Capacity | kgs(lbs) | 250 (550) | 250 (550) | 300/600 (660/1320) | | | |
| Rapid Travel | | | | | | | |
| Rapid Travel (X/Y/Z) | m/min(ipm) | 48/48/48 (1889/1889/1889) | | 48/48/48 (1889/1889/1889) | | 48/48/48 (1889/1889/1889) | |
| Cutting Speed Rate | mm/min(ipm) | 1-10000 (40-393) | | 1-10000 (40-393) | | 1-10000 (40-393) | |
| Feed Motor (X/Y/Z) | kw | 1.5/1.5/2.2 (M) 1.2/1.2/1.8 (F) 2.29/2.29/3.04 (S) | | 1.5/1.5/2.2 (M) 1.2/1.2/1.8 (F) 2.29/2.29/3.04 (S) | | 3.5/3.5/3.5(M) | |
| Tool Magazine | | | | | | | |
| Tool Change Type | | Turret Type | | Turret Type | | Arm (Cam) | |
| Tool Capacity | set | 14 | | 14 | | 20 | |
| Max. Tool Weight | kgs(lbs) | 3 (6.6) | 3 (6.6) | 3 (6.6) | 3 (6.6) | 3 (6.6) | 3 (6.6) |
| Max. Tool Length | mm(inch) | 200 (7.8) | 200 (7.8) | 200 (7.8) | 200 (7.8) | 200 (7.8) | 200 (7.8) |
| Max. Tool Diameter | mm(inch) | 90 (3.5) | 90 (3.5) | 90 (3.5) | 90 (3.5) | 75 (2.9) | 75 (2.9) |
| Tool Change Time (T-T) | sec | 1.7 (std.) / 1.08 (opt.) | | 1.7 (std.) / 1.08 (opt.) | | 1.8 (std.) / 1.2 (opt.) | |
| Tool Change Time (C-C) | sec | 3 | | 3 | | 2.5 | |
| Others | | | | | | | |
| Compress Air Supply | kgs/cm ² (psi) | 6 (100) | 6 (100) | 6 (100) | 6 (100) | 6 (100) | 6 (100) |
| Machine Dimension (LxWxH) | mm(inch) | 2416x1686x2432 (95.1x66.4x95.8) | | 2416x2136x2432 (95.1x84.1x95.8) | | 2890x2671x2430 (113.8x105.2x95.7) | |
| Net Weight | kgs(lbs) | 2750 (6057) | 2800 (6167) | 5680 (12510) | | | |
| Gross Weight | kgs(lbs) | 2850 (6277) | 2900 (6388) | 6230 (13706) | | | |

* All specifications design and characteristics shown in this catalogue are subject to change without prior notice.
* L.K. Machinery Corp will not be legally responsible for any unauthorized modification on the machine or other equipment.

Standard & Optional Equipment

- Direct Driven 10,000 (F) rpm (M.S)
- Turret Type 14 Tools
- BT-30
- MAS P30-1
- Spindle Tool Change Sir Blow
- Side Flush System
- MPG Hand Wheel
- Full Body Enclosure
- Work Light
- Tri color indicator Lamp
- Leveling Bolts & Pads
- Tool Box
- Heat Exchanger
- One Year Mechanical Parts Warranty
- Automatic Lubrication System
- Safty Door
- Direct Driven 15,000rpm (M)
- Direct Driven 20,000rpm (M · F · S)
- Direct Driven 24,000rpm (M)
- Built In 24,000rpm (S)
- Turret Type 14 Tools (Servo)
- Arm Type 20 Tools (Z-axis Travel 530mm/20.8inch)
- CTS (Coolant Through Spindle)
- Spindle Oil Coolant
- Link Type Chip Conveyor
- Rapid Traverses 60x60x60 m/min
- Tool Length Measurement System
- 4th Axis (CNC Rotary Table)
- 5th Axis (CNC Tilling Table)
- Column Add 150mm
- Column Add 250mm
- Auto Door