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Welcome to Litz website for more information

Dealer

2018.B

CV

VERTICAL MACHINING CENTER

CV1200/1400/1600/2000

VERTICAL MACHINING CENTER

Litz Hitech Corp. | Litz Machine Tools (JiaXing) Corp.

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Production Site


Taiwan LITZ Production Site


JiaXing LITZ Production Site


Taiwan LITZ Production Site

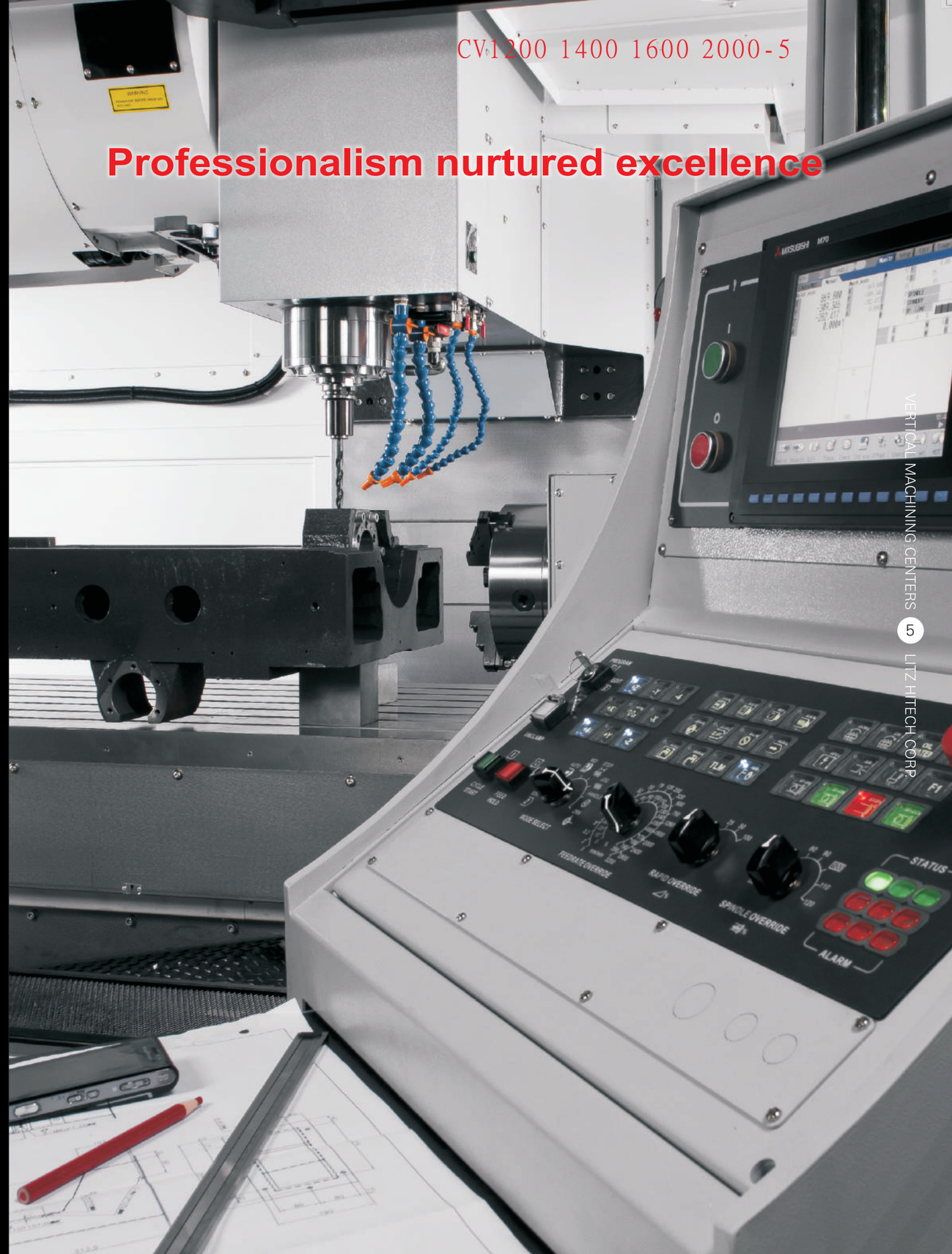

JiaXing LITZ Production Site

Contents

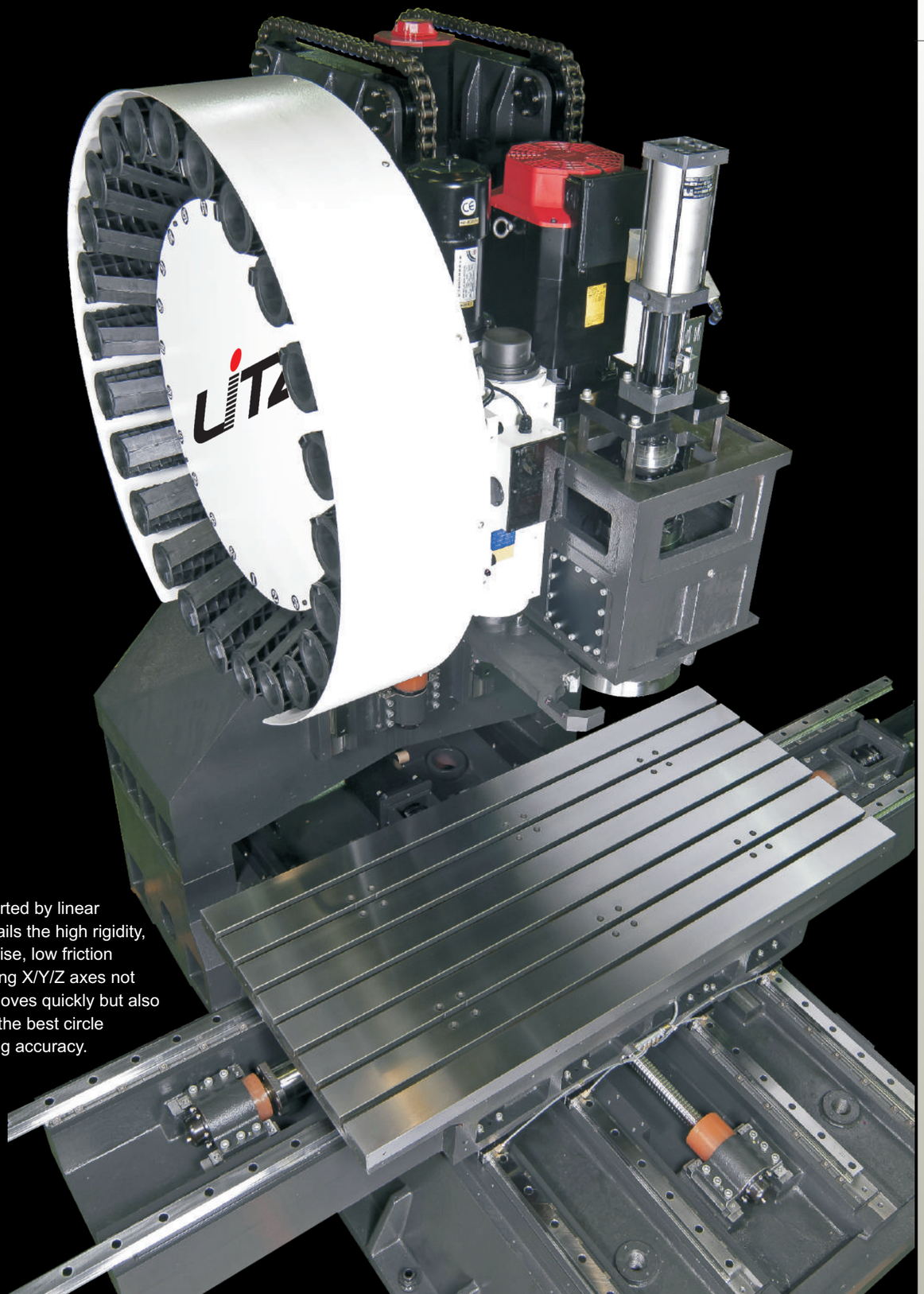
Vertical machining center (VMC)

- **High rigidity**
  Highly rigid body structure design, with Y axis featuring four glidepaths
- **High speed**
  Direct drive by high-speed ball screw with pretension assembly design
- **High precision**
  Spindle with precision graded angular ball bearings for high speed and high precision
- **High efficiency**
  Tool arm type cam based cutter exchange mechanism to cut non-cutting time with speed and agility
- **User friendly**
  User friendly human-machine interface with touch control buttons for easy operation

Professionalism nurtured excellence



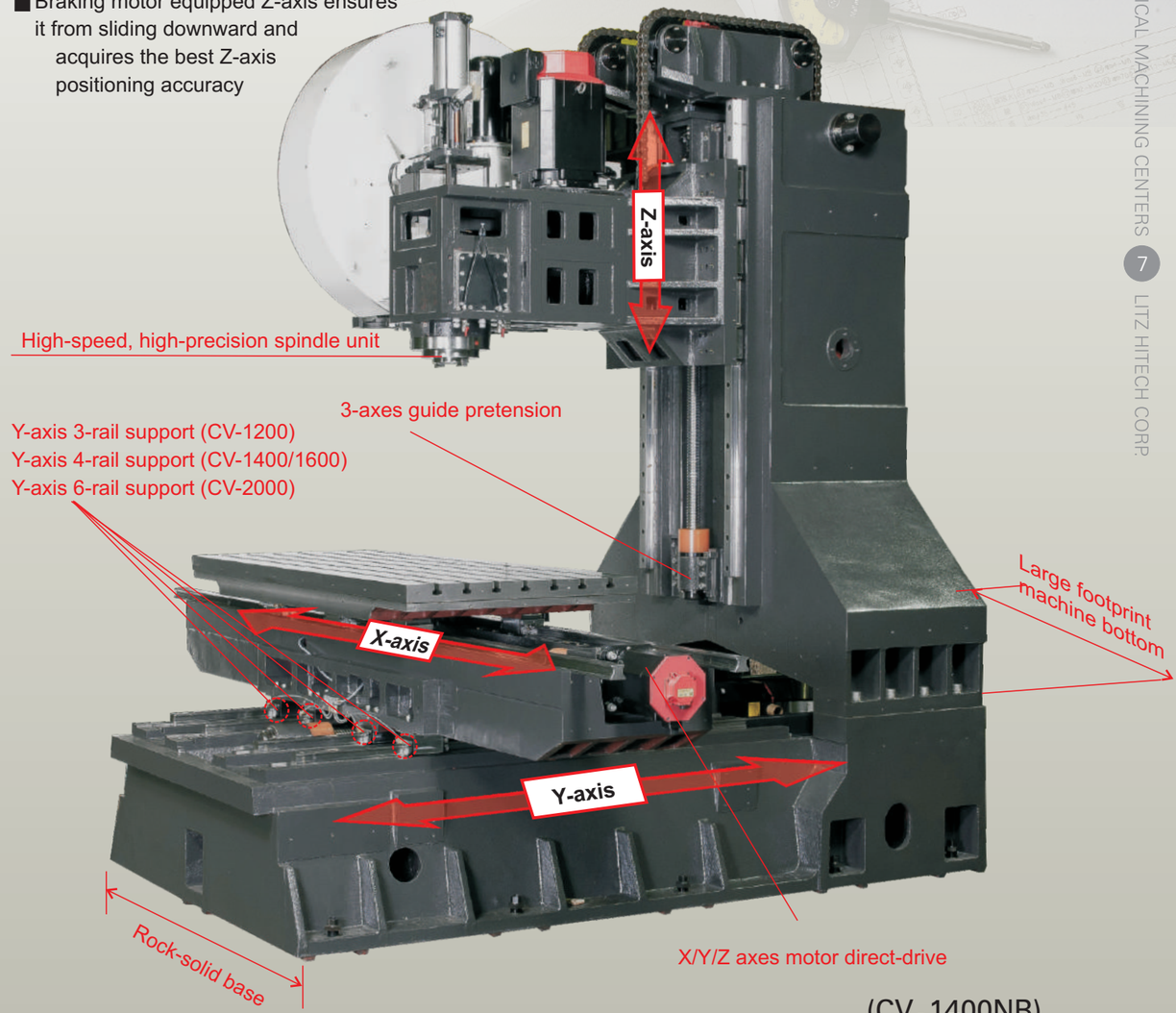
High-performance transmission system



■ Supported by linear slide rails the high rigidity, low noise, low friction featuring X/Y/Z axes not only moves quickly but also offers the best circle profiling accuracy.

High rigidity, high-precision structure design

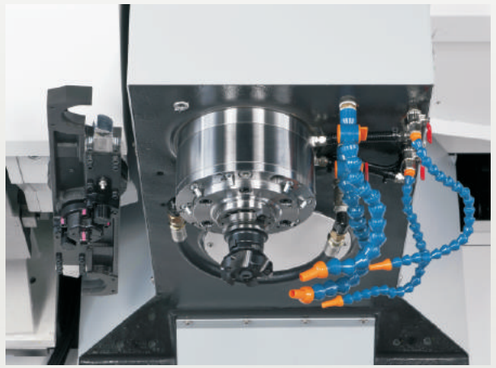
- Casted main structure employs quality Meehanite cast iron with stable structure to ensure long-lasting quality.
- Casting pieces enhanced with reasonable structure strength and reinforced rib support based on finite element analysis computing gives high rigid body mechanics.
- 4-glidepath supported Y-axis ensures precision positioning to support heavy load and quick movement.
- Hard track based Z-axis with the best force flow strength compliant design.
- Wide and solid base, box structure mast, widened and lengthened saddle, heavy load full support design, and robust structure combined to ensure heavy load support for machining.
- Solid main shaft support, thanks to rib reinforced main shaft head and reasonable head-mast contact length ratio.
- 3-axis motor and precision high-speed ball screw direct-drive and pretension assembly for improved rigidity and precision.
- Guide rail supported counterweights to keep the latter from shaking and ensure quick motion of the Z-axis as well as high precision.
- Supported by linear slide rails the high rigidity, low noise, low friction featuring X/Y axes not only moves quickly but also offers the best circle profiling accuracy.
- Acquire the best accuracy with ball bar circle profiling and parameter pre-adjustment.
- Braking motor equipped Z-axis ensures it from sliding downward and acquires the best Z-axis positioning accuracy



(CV - 1400NB)

High-speed, high-precision spindle unit

Spindle Unit

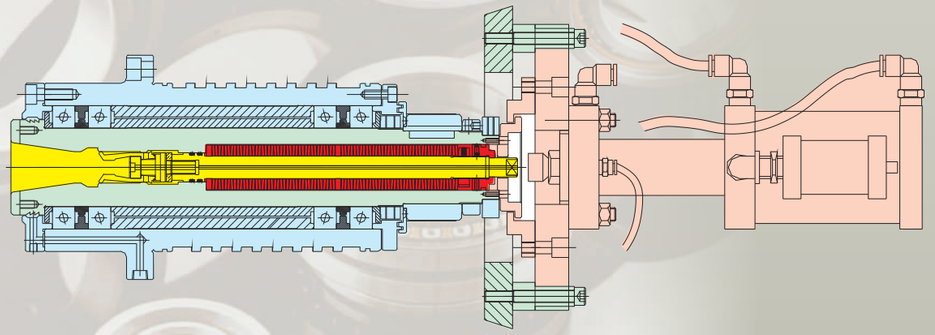


- The spindle uses an angular contact ball bearing with high speed and high precision.
- The four jaw collet provides strong tool holding force, large contact area, low wear on the tool shank, and long service time.
- A high horsepower spindle motor is used for standard machines, suitable for high speed and heavy cutting.
- The spindle is driven by a high torque timing belt, there is no slipping, and the noise and heat generated during transmission are significantly reduced.
- Online spindle dynamic balancing is achieved through an IRD dynamic balancing system, eliminating the resonance caused by a high speed rotating spindle and assuring optimized machining precision.

Spindle oil cooler system OP

- Coolant driving spindle oil cooler is secured to the machine to minimize its footprint.
- The high speed rotating spindle with a spindle oil temperature control system can maintain the spindle at constant temperature and control the thermal displacement of the spindle effectively, to assure the high speed and precision of the spindle.

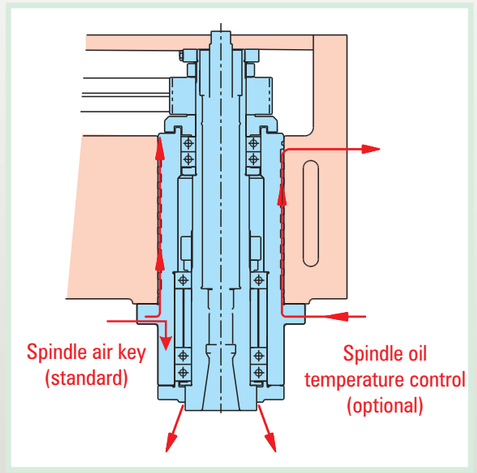
Floating Unclamping Tool Mechanism (CV-1400NA)



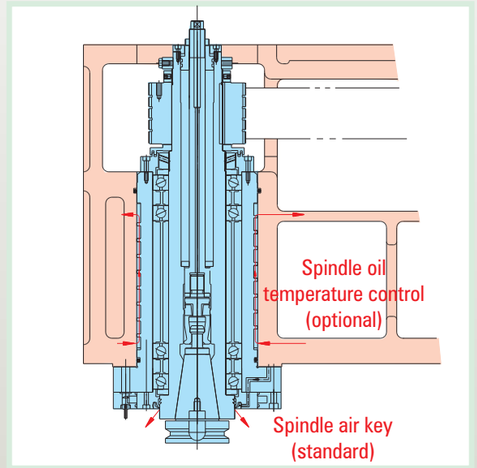
- A floating tool unclamping mechanism is applied and the force generated by tool releasing will not be transmitted to the spindle bearing. Thus the life of the spindle bearing is extended.

Spindle specification and feature

Spindle air curtain dust protection system



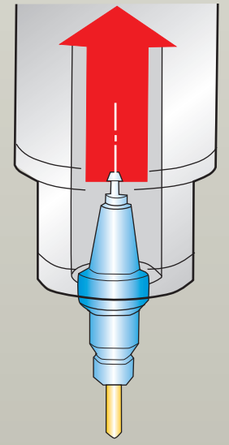
BT-40 spindle

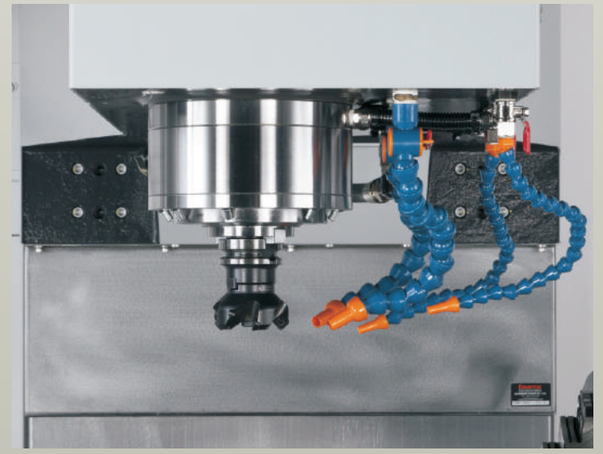


BT-50 spindle

- The spindle air curtain protection system effectively controls vacuuming dust due to high-speed operation of spindle to ensure spindle accuracy and maximize its service life.

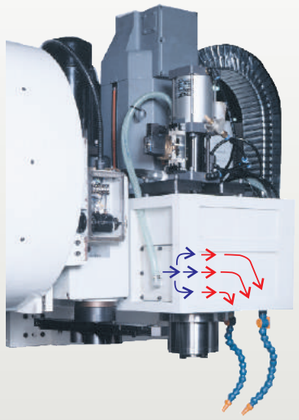
Spindle tensile





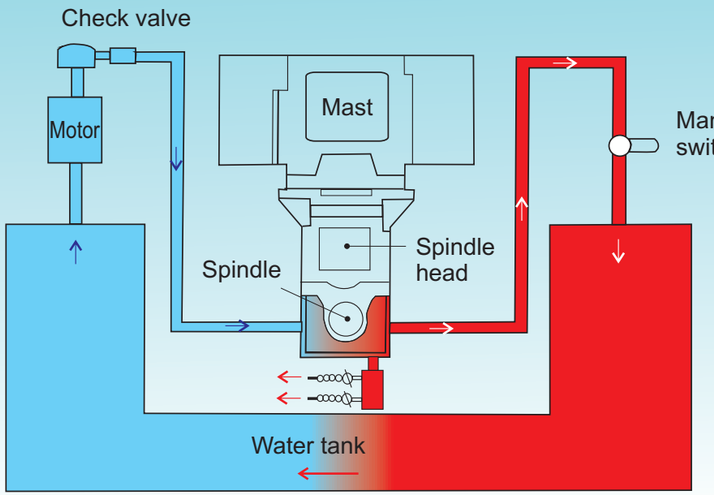
- High-tensile spindle for improved tool clamping, high rigidity, and enhanced cutting rigidity.

Spindle head and spindle water-cooling system – gets rid of heat displacement of Z-axis completely.

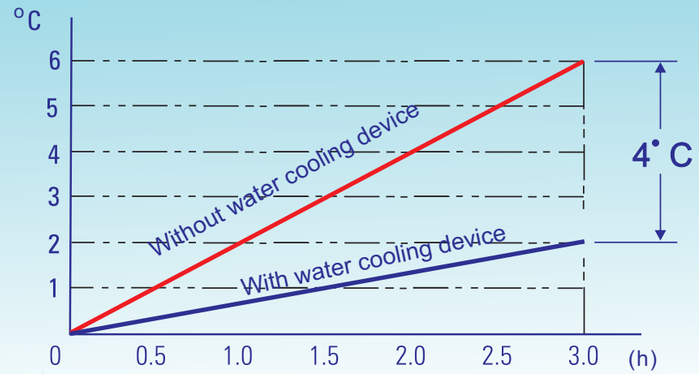


- The unique and affordable spindle head cooling system design removes heat brought by high-speed spindle operation and keeps it free from heat displacement.
- Optimum cooling effects without adding pump, filter, or hydraulic oil in the system.
- Reduce heat generated by spindle during high-speed operation, ensure its accuracy, and maximize its service life.
- Circuit different featured by the system maintains cooling effect even in case of dry cutting.

Spindle head water cooling diagram



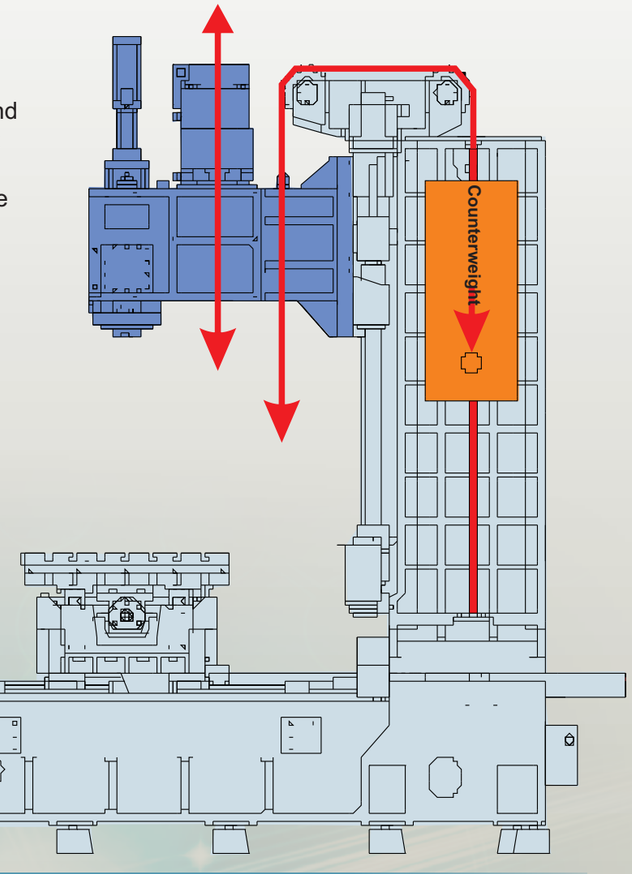
Spindle head water cooling benefits diagram



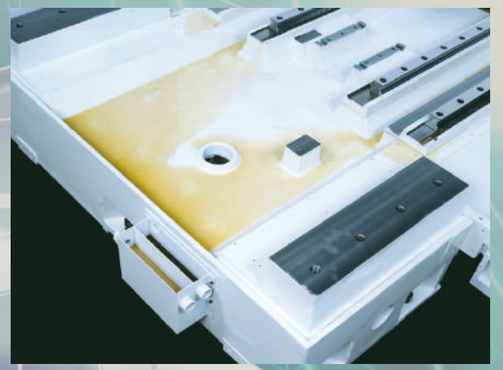
Unique design

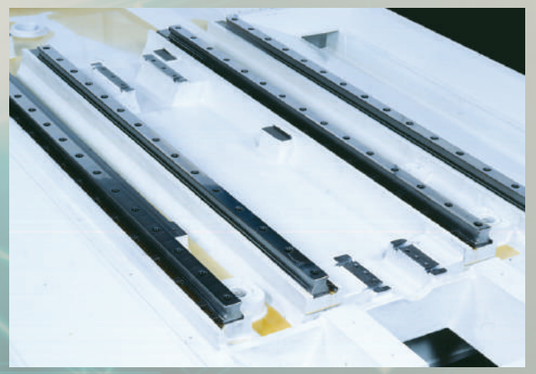
Counterweight central guide device CV-1400 NB

- Central guide featuring counterweight design to keep the latter from shaking and ensure quick precise motion of the quick spindle motion.
- Well-balanced counterweight and spindle heads weight for the best machining performance.



Oil-coolant separation design

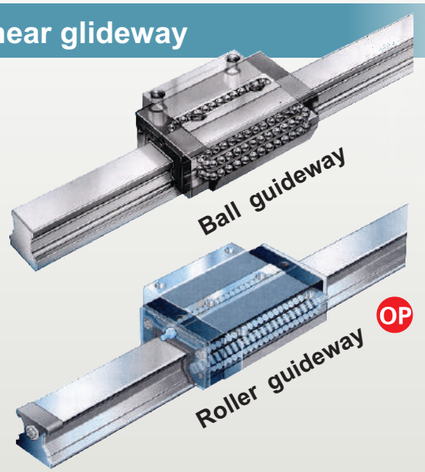




- Featuring water-oil separation design to prevent cutting solution deteriorating from mixing with oil and hamper machining quality.

High-speed, high-precision linear glide rail

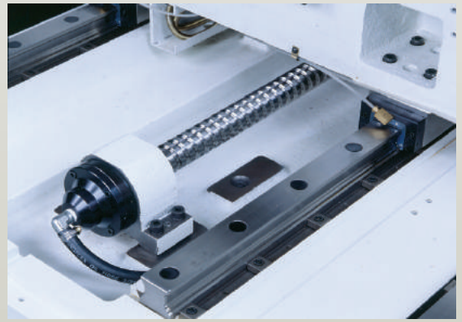
Linear glideway



Linear glide rail feature

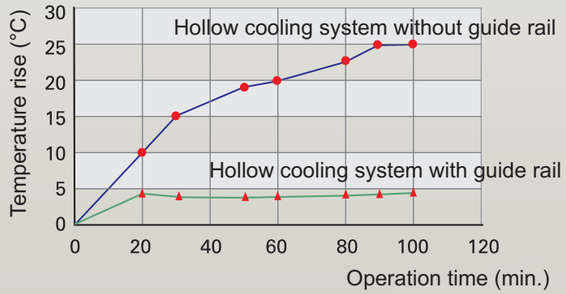
- Linear guide rail with zero gaps to enable uniform arc and bevel cutting with uniform surface strips.
- High-speed operation with drastically reduced driving horsepower.
- Employ linear guide rails to replace sliding with rolling for smaller friction loss, more sensitive response and higher positioning accuracy.
- Withstand load from all directions at the same time while maintaining multi-point contacts to keep cutting rigidity from degrading.
- Easy assembling and exchangeable plus simple lubrication structure.
- Linear guide rails wear very slightly which, in turn, lead to long service life.

3-axis coolant through ballscrew OP



- The 3-axis transmission guide rod system employs hollow cooling design to minimize heat and thermal expansion of ball screw in high-speed operations with cooling oils to balance high speed and high precision at the same time.

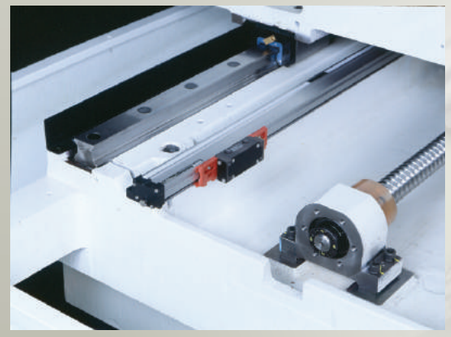
C.T.B Effectiveness Graph



Test conditions

Ball screw Diameter (mm)	Revolutions per minute (RPM)	Oil control temperature (°C)	Coolant flow rate L/min
∅50xP30	1000	20	2.5

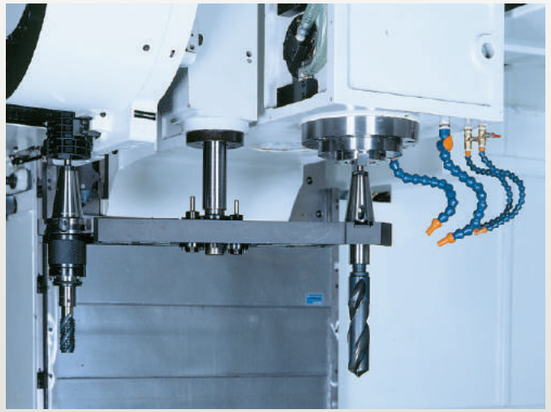
High precision linear scale OP

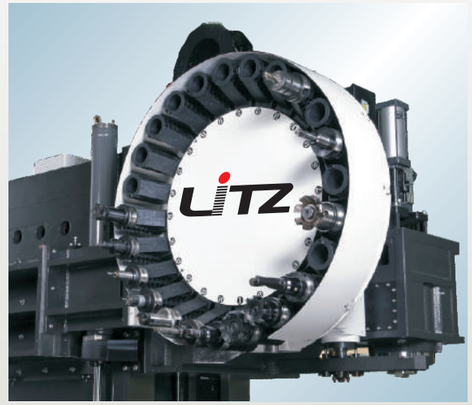


- The X/Y/Z axis may equip with optical ruler system to detect heat displacement due to fast machine motion and feed the data to traffic control for compensation. This is ideal for high-precision components machining.
- The optical rule system is equipped with gas protection device to prevent it from being contaminated by dust and oil mist, ensuring its accuracy, and maximize its service life.

Stable and reliable ATC

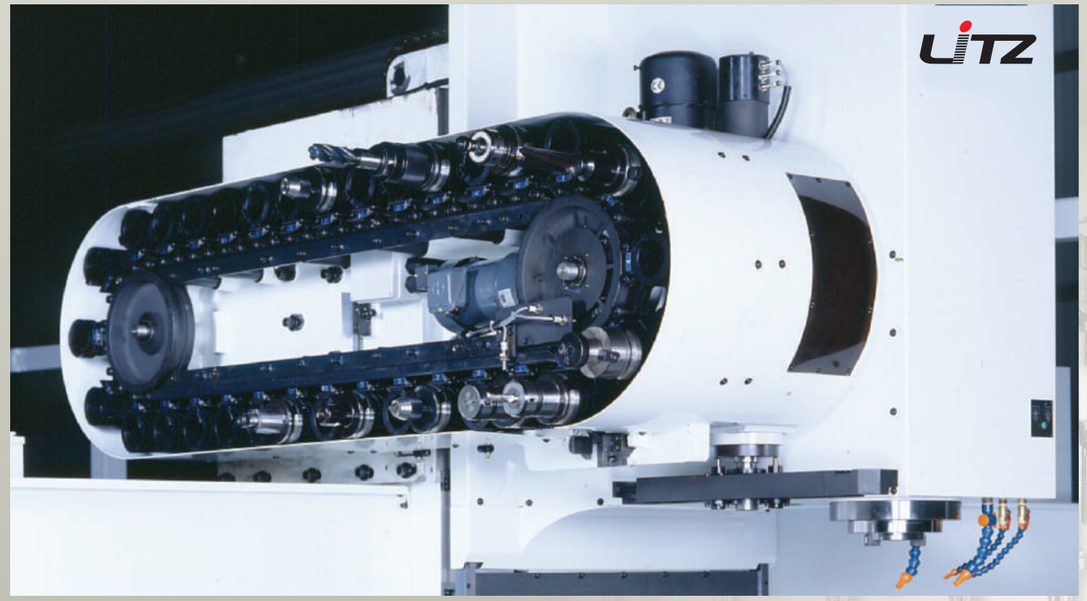
Arm type tool exchanger (C-1400 NB)





- Fast, simple, reliable and long-life tool exchange mechanism provides smooth and reliable tool exchange.
- The unique tool exchange device design, advanced cam drive, and any-position tool selection capacity, all under fast PLC software control.
- Thanks to million operation tests the tool exchange mechanism meets reliability requirements.
- Fast tool exchange mechanism saves non-cutting time and improves production efficiency.
- The cam-driven tool magazine ensures high-precision rotation to enable smooth operation with heavy-duty tools.

Chain tool exchanger OP

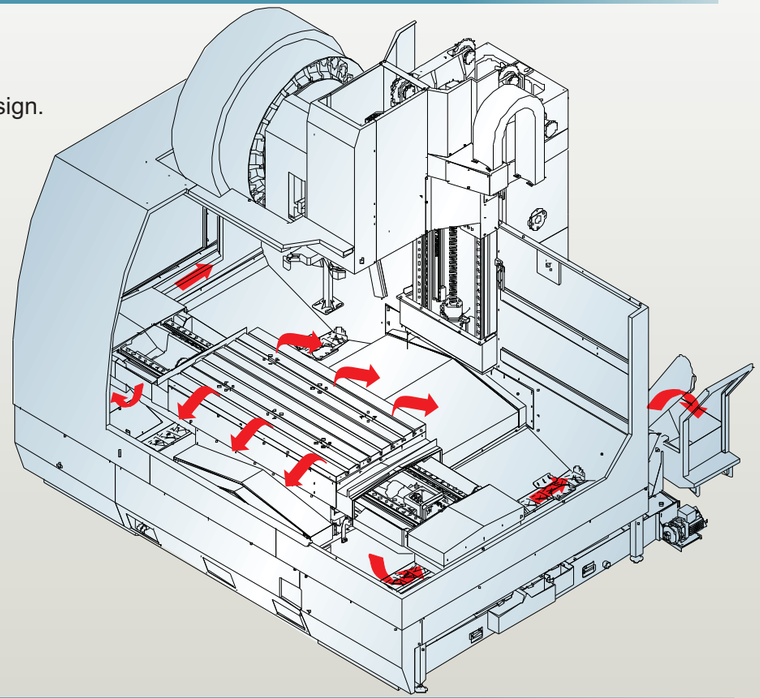


- Chain tool exchanger with 32-tool storage for machining works requiring multiple tools.

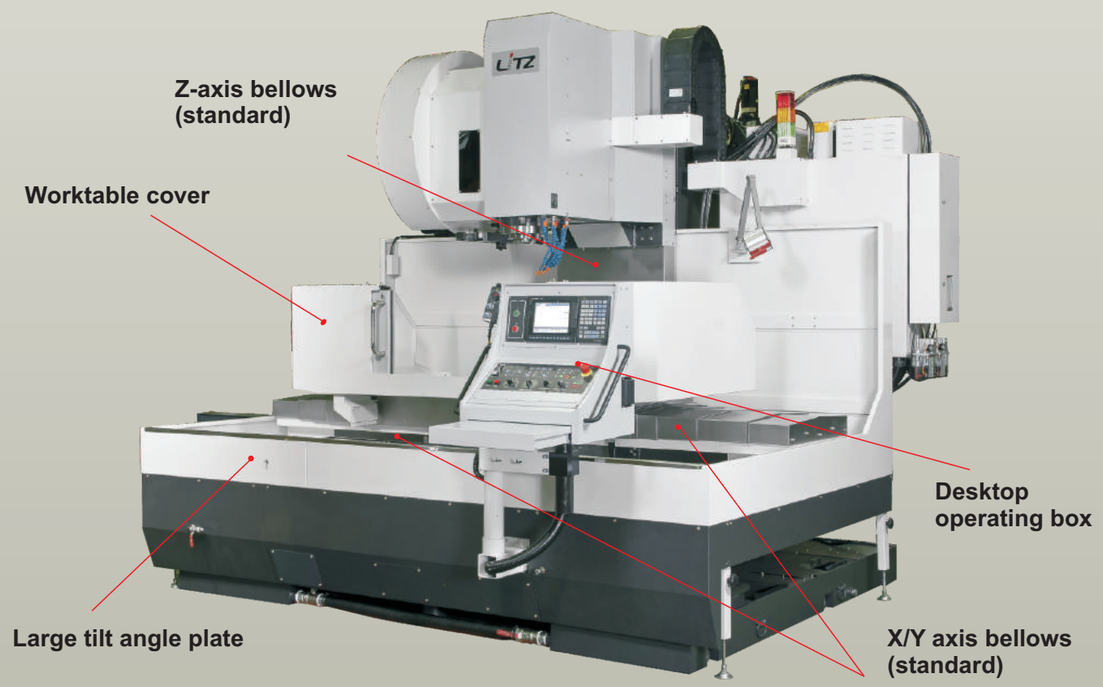
High-efficiency chip removal mechanism – eliminate chip removal problems suffered by VMC

Protection cover and chip prevention plate (full cover)

- Machine body fully covered design.
- Transmission system equipped with high-speed, low-noise bellows protection.
- Chip removal spiral at both sides of machine body to discharge collected chips in the trolley behind the machine.
- Optimized chip removal process to reduce non-cutting time and improve machine availability.

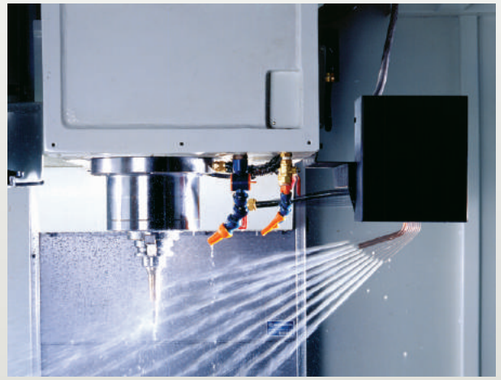


Protection cover and chip prevention plate (half cover) OP



Cutting solution cooling mechanism

Programmable nozzle adjustment device OP



- Programmable nozzle adjusting device: you may add M code in machining scripts to change nozzle angle according to tool length during machining.
- Control cutting solution easily and precisely to cool contacts in between tools and workpieces, remove heat during production, and improve machining quality.

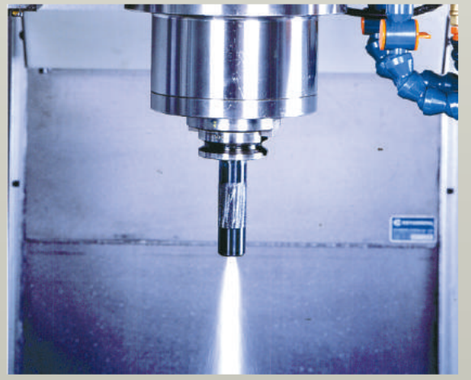
Deep hole drilling block and oil cutter handle OP

- Deep holing block and oil cutter handle for components requiring deep holing.
- Work with various oil passage cutter handles with water feeding to meet various cooling needs.

Spindle splash ring OP

- Spindle ring sprinkler featuring 8 nozzles around it to optimize cooling effects on tools and workpieces for improved machining quality.

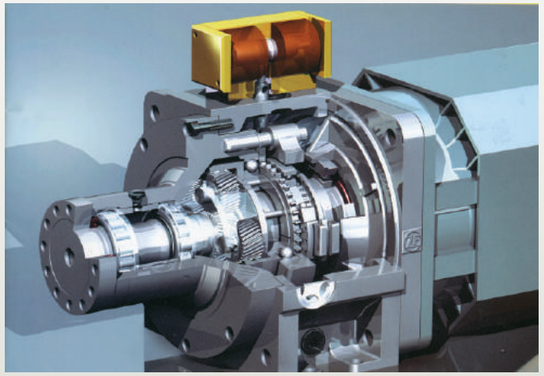
C.T.S Coolant through spindle OP



- Add central water feeding system to spindle to inject cutting solution through spindle center and out of tool tip; this directly cools workpieces and tool blades for deep hole machining with guaranteed machining quality by removing cutting heat.

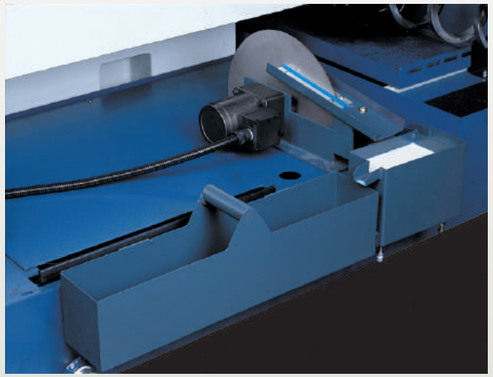
High-performance configuration

ZF gearbox and cooler from Germany OP



- Large horsepower motor aligned with ZF gearbox from Germany to give big torque at low RPM that is ideal for heavy duty cutting.
- ZF gearbox remains steady, smooth and quiet even at high speed operation.
- ZF gearbox comes with oil cooler to remove heat generated by its high-speed operation which, in turn, ensures transmission quality and long service life.

Disc type oil-coolant separator OP



- Disc type oil-water separator is easy to install and occupy no extra space.
- Disc type oil-water separator isolate oils in water tank to maintain quality of cutting solution, maximize its life cycle, and maintain machining quality.

Automatic voltage stabilizer OP

- Input voltage: 110V/220V/380V; frequency: 60HZ/50HZ.
- Input voltage stability:±1%. Frequency stability: same as input voltage.
- Featuring overload protection, additional voltage and bypass protection function available.
- Featuring high/low voltage and surge protection function.
- Featuring phase failure protection function.
- Featuring instantaneous power outage delay protection function.
- Correct phase imbalance within 2% from up to 30%.

Air Conditioner for Electrical Cabinet OP

- The controller, motor driver, and other electronic components in electric box can remain operating at room temperature and in a clean environment. Prevent failure or shutdown due to high temperature from long-time operation.

Safety door system

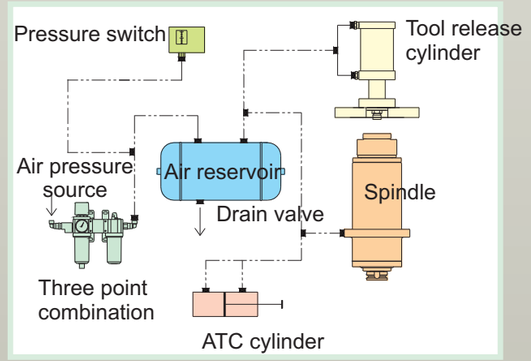
Safety door system

CE specifications OP

Safety switch (standard)

- The machining program starts only when the safety door is closed to ensure operator safety.
- The machining program stops immediately once the safety door opened during machining to ensure operator safety.

Air reservoir system



- Prevent machine operation error due to instant pressure drop or low pressure in the compressed air system when multi-systems relying on one source of air.
- Air reservoir features manual drain function.

Lubrication system filer detection

- Oil and air pressure units both come with error detection system

Convenience

Convenient document clip and stationery drawer

- Document folder and notepads are attached on the side of the operation cabinet. Operators can put the work order or important data on the folder.
- The stationery drawer is located on the back of the document folder. Operators can put the stationery, discs, or IC card inside for easy management.

User friendly desktop operation box

Convenient service access

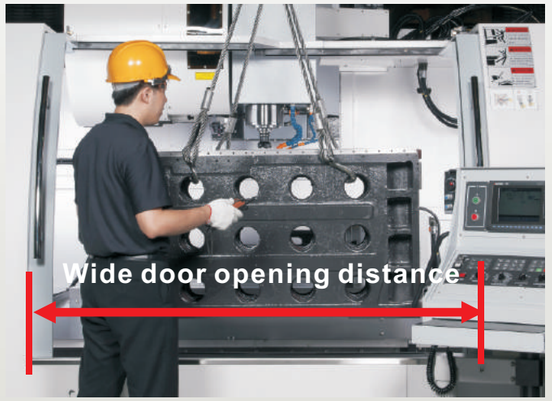
- Centralized air compressing system and lubricating system is easy for repair and maintenance.

Tool shelf and tool cabinet OP

- Operators can use the tool shelf attached on the side or back of the machine to store the tools temporarily.
- A tool box is placed under the tool shelf to store the material for machine maintenance.

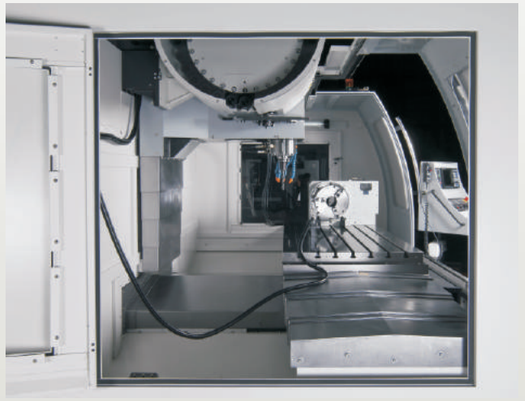
Accessibility

Extra-wide front door



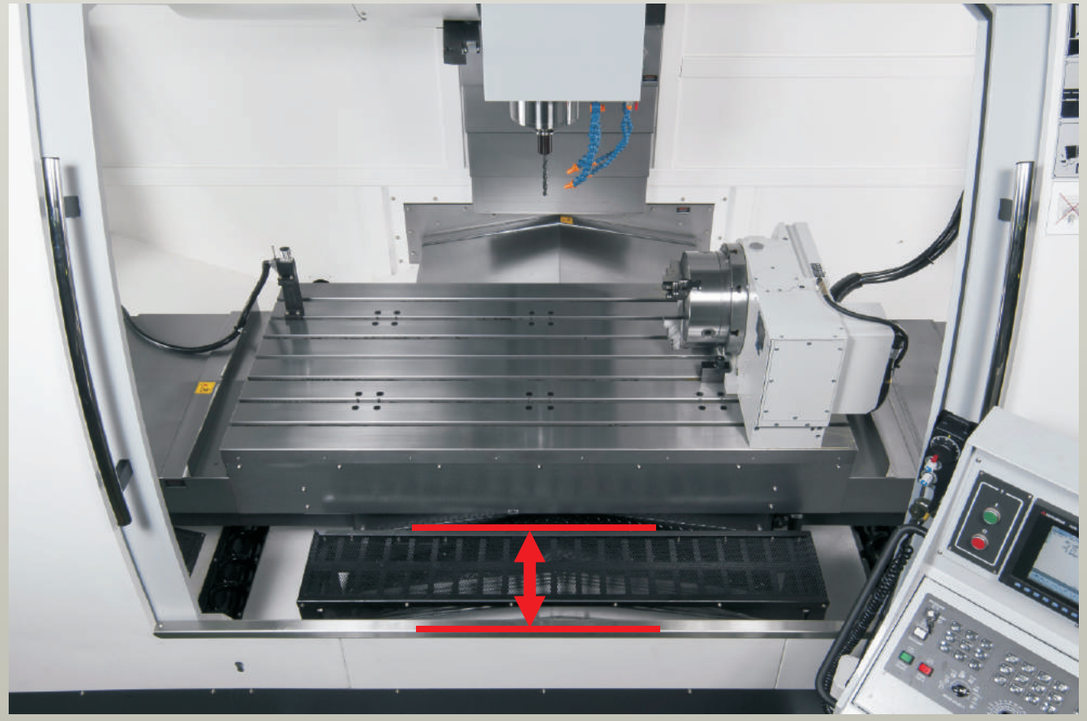
- Extra-wide door, easy for loading/unloading the parts or jigs to/from the machine.

Extra-large side window



- Wide windows on both sides of the machine, easy for installation and cleaning.

Worktable Accessibility



Easy access to the worktable

- Short distance between the operator and worktable, easy for operation inside the machine.
- Shortens the distance between the front of the machine and the worktable.

User friendly human-machine interface

Desktop operation box

- Safety specification compliant and rotatable operation panel for easy operation.
- Separate hand wheel design for easy machine setup.
- Desktop and rotatable connecting rod design for easy operation.

User friendly operation panel

- Touch button design for easy and quick input.
- Graphic and Chinese display panel, easy to read and user friendly.
- Critical keys on panel are protected with caps, which mandates execution only after validation to prevent invalid acts.
- Red light indicators turn on in case of machine failure for easy troubleshooting.

Advanced Control System

FANUC (Japan) Controller Series

CNC FANUC Series 0i-MF with Outstanding Reliability and Cost Performance

○:Basic ☆:Option -:Not available

	Model			
	1	2	3	5
Max. number of axes controlled	11	9	6	6
Max. number of paths controlled	2	1	1	1
Display	15/10.4/8.4	10.4/8.4	10.4/8.4	10.4/8.4
Max. cutting feed speed for 1mm-long path program: 60m/min, Max. number of preview blocks: 400	☆	-	-	-
Separated Control Unit	☆	-	-	-
Working network	☆	☆	-	-
High quality machining software packages	☆	☆	☆	-
Large capacity program operation (copy to CF card from USB/ethernet)	○	○	○	○
Preparation and supports before machining	○	○	○	○
Multi-language (Vietnamese, Indonesian, Tamil)	○	○	○	○

Mitsubishi Controller Series

High end controller from Mitsubishi achieves higher productivity and comfort

CNC M800/M80 Series

CNC dedicated CPU

Fine segment processing capacity
High capability in program processing enables a shorter cycle time .

PLC process capability (PCMIX value)
High processing capability of the PLC enables large-scale ladder logic to be processed at high speed.

NC-to-drive communication capability
Optical communication speed between NC and drive has been increased. This improves the system responsiveness, leading to more accurate machining.

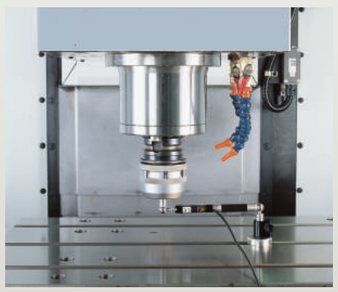
Advanced inspection equipment and technology

Finished goods inspection

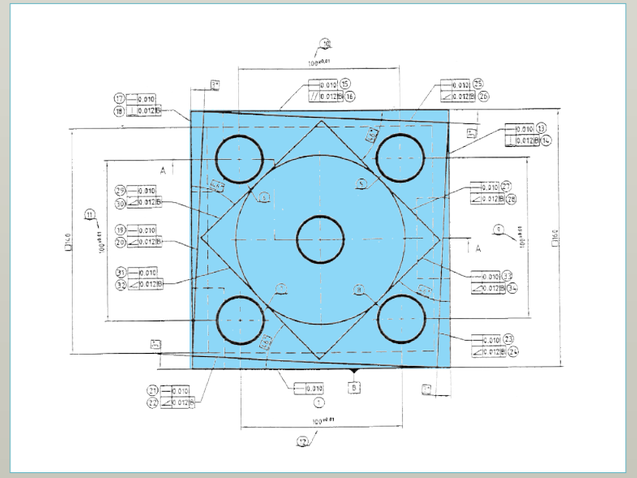
Laser inspection
Full travel movement accuracy is compensated by laser calibration compensation to ensure accuracy and calibration results of machine.

Spindle dynamic balance calibration
Calibrate spindle speed, displacement and acceleration characteristics of spindle at the highest RPM with IRD dynamic balance device.

Circle profiling test
Using circle profiling measurement instrument to calibrate true circle precision and geometrical accuracy of machine to test and ensure 3D motion accuracy.



Standard block test (dynamic cutting)



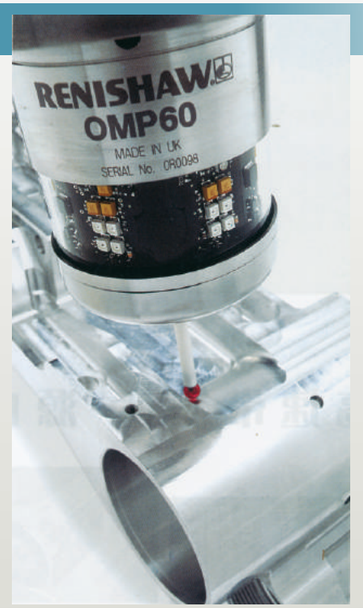
- In addition to measurement by precision instruments each machine shall subject to international standards compliant dynamic cutting tests.

- The standard test blocks after machining shall subject to measurement by 3D CMM (Coordinate Measuring Machine) to ensure compliance of accuracy with standard.

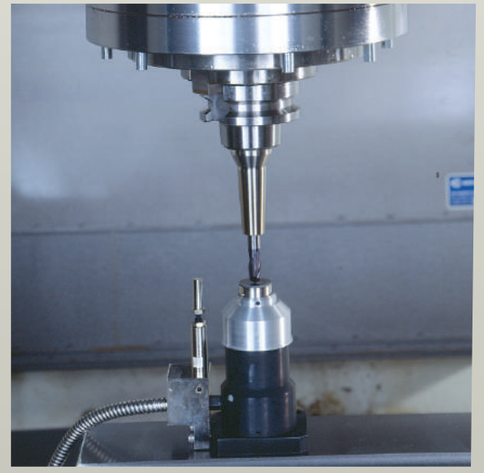
Machine Equipped Measuring Devices

Workpiece Measurement System OP

- The Renishaw workpiece measuring system is installed.
- New generation OMP 60 optical probing system.
- The OMP 60 provides simple measurement, which can reduce the time for setting up the machine by up to 90%, reduce the reject rate, and fixture costs and improve the process control.
- The OMP 60 uses microelectronics and components, thus providing a compact structure.
- Optionally, the probe can be equipped with an OMI-2 interface receiver. The system uses state-of-the-art modulated optical transmission with excellent light interference resistance capability.
- The probe is equipped with a 360° infrared optical transmission system. The transmission distance is up to 6m and the probe can perform measurement from any direction.



Tool Length Measurement OP



- The automatic tool measuring system will measure the tool length and input the result into the controller automatically for compensation.
- Automatic tool measuring is controlled by macros, which can perform the measurement automatically and are easy to operate.

IR tool damage detector OP

- The IR tool damage detector is aimed to identify any damages to mini tools before machining and signal the NC controller to hold the next machining process.
- The IR tool damage detector beeps or flashes light indicators to in case of any tool damages found to enable operator's knowing about machining structure all the time.

High-efficiency and high-performance cutting capacity

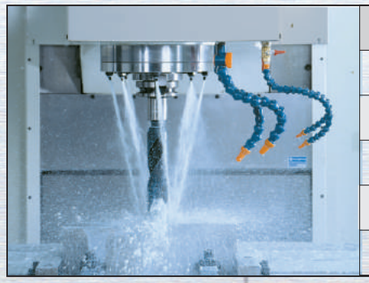
■ Plane milling ability

Tool	Ø80 plane milling tool (6 blades)
Model	CV-1400N
Material for machining	S50C
Spindle RPM	1000
Feeding speed mm/min	1800
Cutting depth mm	5
Cutting removal volume cm³/min	720

■ Grooving capacity

Tool	Ø40 end milling tool
Model	CV-1400N
Material for machining	S50C
Spindle RPM	500
Feeding speed mm/min	175
Cutting depth mm	25
Cutting removal volume cm³/min	150

■ Holing capacity



Tool	Ø50 drill
Model	CV-1400N
Material for machining	S50C
Spindle RPM	160
Feeding speed mm/min	40
Cutting removal volume cm³/min	79

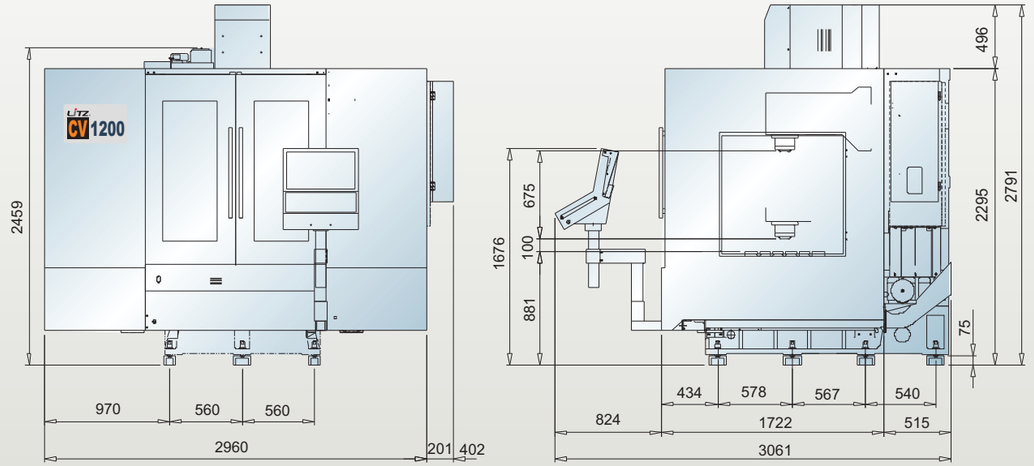
■ Tapping capacity

Tool	M36XP4.0 tapper
Model	CV-1400N
Material for machining	S50C
Spindle RPM	88
Feeding speed mm/min	352

Looks and dimension diagram

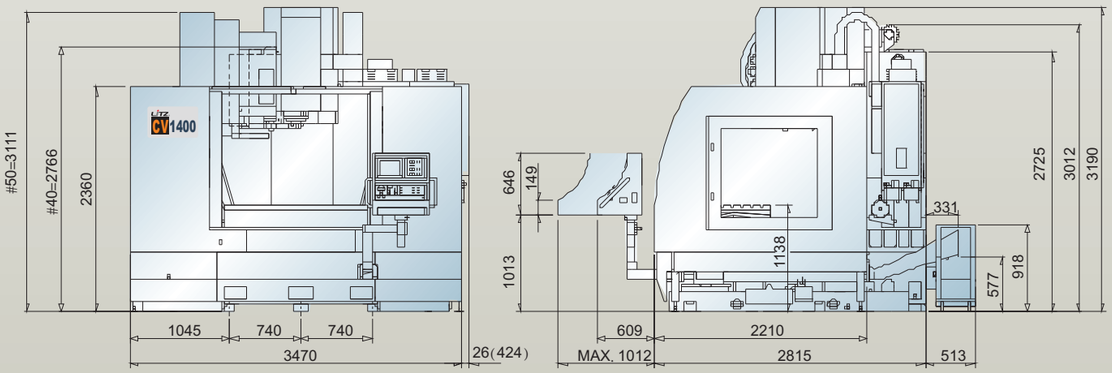
Unit mm

CV-1200

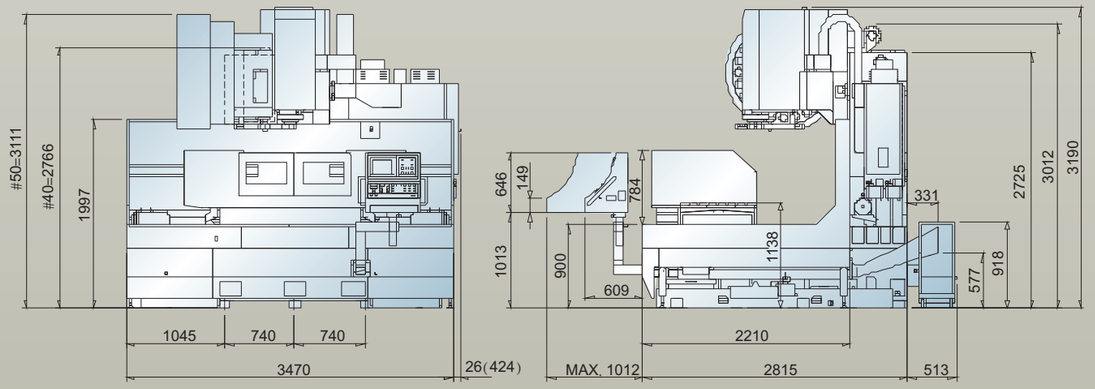


CV-1400N

Full mask



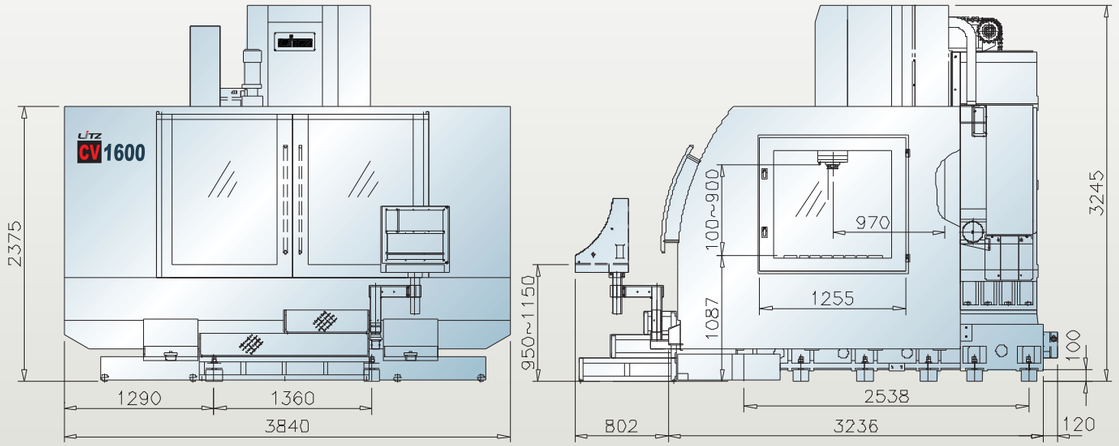
Half mask



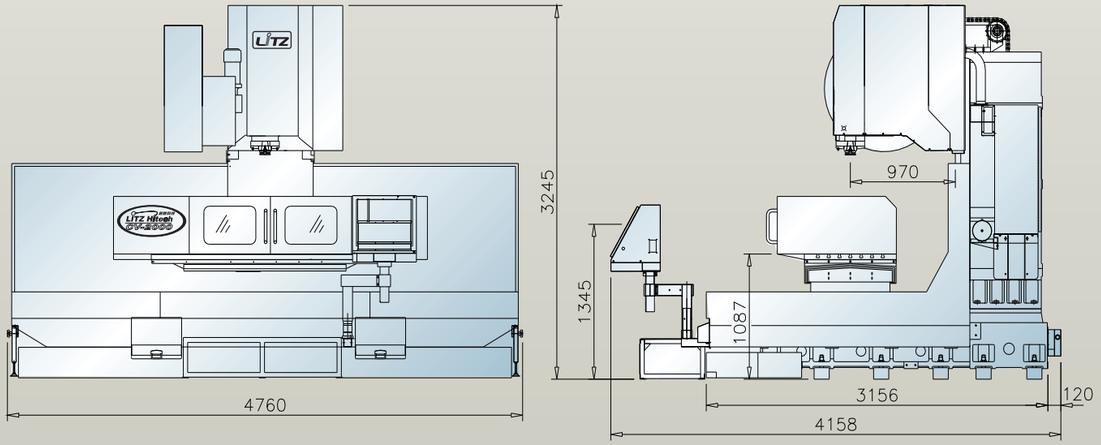
Outline Dimensions

Unit: mm

CV-1600

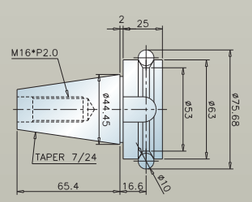


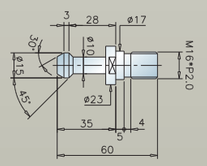
CV-2000



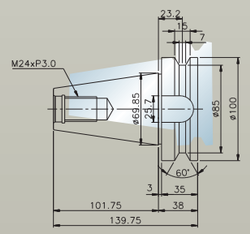
Tool Shank and Pull Stud

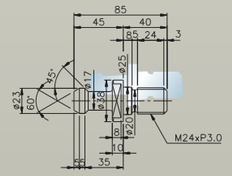
BT-40





BT-50

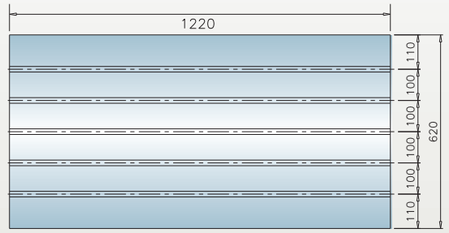




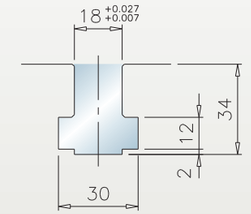
Worktable Dimensions

Unit: mm

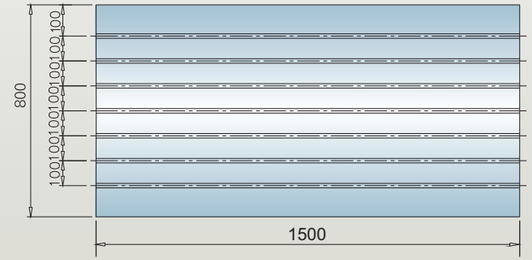
CV-1200



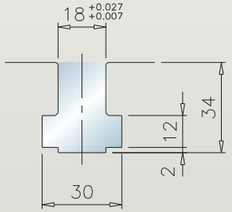
CV-1200 T-Slot dimensions



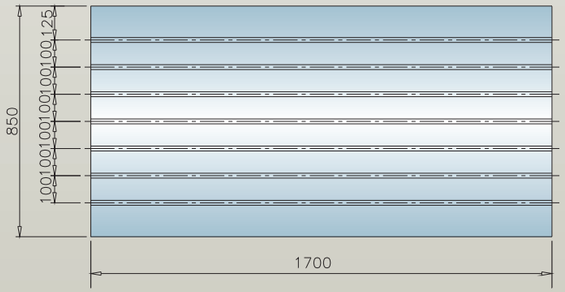
CV-1400N



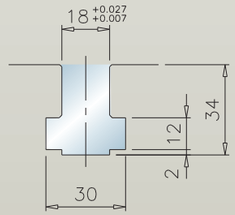
CV-1400N T-Slot dimensions



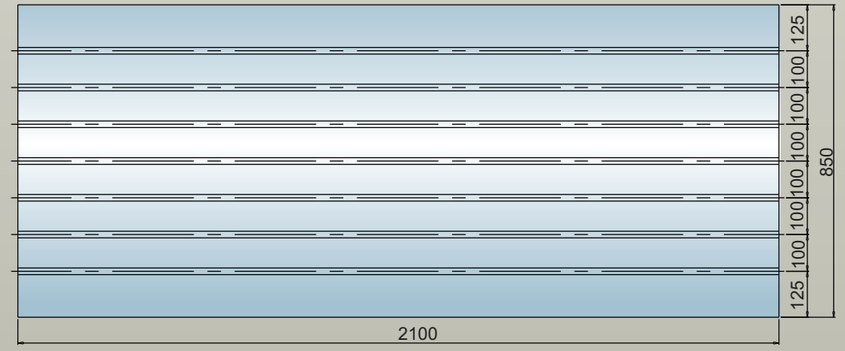
CV-1600



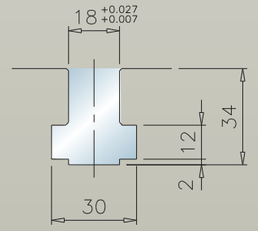
CV-1600 T-Slot dimensions



CV-2000



CV-2000 T-Slot dimensions



Machine Specifications

Model		CV-1200A(B)	CV-1400NA(B)	CV-1600	CV-2000
Travels for 3-axes					
X-axis Travel	mm	1200	1400	1600	2000
Y-axis Travel	mm	600	800	900	900
Z-axis Travel	mm	675	740	800	800
Spindle nose to worktable surface	mm	100-775	100-840	100-900	100-900
Spindle					
Spindle Speed	rpm	8000(6000)	8000(6000)	6000	6000
Automatic Tool Changing System					
Number of Tools	pcs	24	30(24)	24	24
Max. tool diameter	mm	80/125	85/150【125/225】	125/225	125/225
Max. tool length	mm	300	300(350)	350	350
Max. tool weight	kg	7(15)	7(15)	15	15
Tool changing method		ARM	ARM	ARM	ARM
Tool specification		BT-40(BT-50)	BT-40(BT-50)	BT-50	BT-50
Motor					
Spindle motor (continuous/30min. rated)	kw(HP)	11/15【15/20】(15/18.5【20/25】)	15/18.5【20/25】	15/18.5【20/25】	15/18.5【20/25】
Motors on X/Y/Z-axis	kw	2.0/2.0/3.5(3.5/3.5/3.5)	3.5/3.5/3.5	3.5/3.5/3.5	4.5/4.5/4.5
Worktable					
Worktable area	mm	1220 x 620	1500 x 800	1700 x 850	2100 x 850
Worktable max. load capacity	kg	1000 (1200)	1600	2000	3000
T-slot (No. x Width x Distance from the center)	mm	5x18x100	7x18x100	7x18x100	7x18x100
Rapid Speed					
X-axis rapid speed	M/min	24	20	20	20
Y-axis rapid speed	M/min	24	20	20	20
Z-axis rapid speed	M/min	18	18	Box way:15	Box way:15
Cutting feed rate	mm/min	1-20000	1-20000	1-8000	1-20000
Controller					
Mitsubishi		M80	M80	M80	M80
Miscellaneous					
Machine Weight	kg	8500 (9000)	14500 (15000)	19000	21000
Power Consumption	KVA	35	40	40	40
Coolant Tank Capacity	L	360	500	500	550
Compressed air source	kg/cm²	6	6	6	6

■ All the photos contained herein are for reference only. In case of any discrepancy with the actual machine parts, the actual machine shall prevail.

■ LITZ reserves the right to modify the product specifications, appearance, equipment or discontinue the products.

Equipment List

● Standard ○ Options ☆ Upon request

	CV-1200A	CV-1200B	CV-1400NA	CV-1400NB	CV-1600	CV-2000
Spindle						
Spindle speed: 6000 RPM	—	●	—	●	●	●
Spindle speed: 8000 RPM	●	○	●	○	○	○
Spindle speed: 10,000 RPM	○	○	○	○	○	○
Spindle speed: 12,000 RPM	○	—	○	—	—	—
Spindle oil cooling system	○	○	○	○	○	○
Coolant through the spindle system (CTS)	○	○	○	○	○	○
Spindle dust-proof air-sealing system	●	●	●	●	●	●
Spindle head coolant cooling system	●	●	●	●	●	●
Cooling System						
Spindle external programmable air blow system	●	●	●	●	●	●
Stop block for oil feed tool holder	○	○	○	○	○	○
Programmable coolant nozzle	☆	☆	○	○	○	○
Splash ring (arm type only)	☆	☆	○	○	○	○
Coolant cooling system	○	○	○	○	○	○
Chip Removal System						
Chip auger inside the machine	●	●	●	●	●	●
Chip conveyor	○	○	○	○	○	○
Chip cart	●	●	●	●	●	●
Coolant gun for machine cleaning	●	●	●	●	●	●
Air gun for machine cleaning	●	●	●	●	●	●
Wash down device	○	○	○	○	○	○
Worktable cover (Half mask)	○	○	○	○	○	○
Fully-covered sheet metal	●	●	●	●	●	●
Hood for the top of the machine	○	○	—	—	—	—
Measurement System						
Infrared tool breakage detection	○	○	○	○	○	○
Tool length measurement system	○	○	○	○	○	○
Workpiece measurement system	○	○	○	○	○	○
CCD measurement system	—	—	○	○	○	○
Oil/coolant separator						
Disc type oil/coolant separator	○	○	○	○	○	○
Machine oil/coolant separation system	●	●	●	●	●	●

	CV-1200A	CV-1200B	CV-1400NA	CV-1400NB	CV-1600	CV-2000
ATC System						
Automatic Tool Changer Mechanism (ATC)	●	●	●	●	●	●
BT-40 tool specification	●	—	●	—	○	○
BT-50 tool specification	—	●	—	●	●	●
Arm type tool magazine 24T	●	●	○	●	●	●
Arm type tool magazine 30T	○	○	●	—	○	○
Arm type tool magazine 32T	○	○	○	○	○	○
Arm type tool magazine 40T	○	○	○	—	○	○
(BBT , CAT....)	○	○	○	○	○	○
3-Axes Transmission System						
3-axes coolant thru ballscrew (CTB)	○	○	○	○	○	○
3-axes linear roller guideway	○	○	○	○	○	○
3-axes linear scale	○	○	○	○	○	○
Z-axis brake motor system	●	●	●	●	●	●
Counter weight central guide device	●	●	●	●	●	●
Electrical Parts						
Work light	●	●	●	●	●	●
Alarm indicator	●	●	●	●	●	●
M30 automatic power off system	●	●	●	●	●	●
Heater exchanger for electrical cabinet	●	●	●	●	●	●
Air-conditioner for electrical cabinet	○	○	○	○	○	○
Front Door Safety System	●	●	●	●	●	●
Controller						
Mitsubishi M80	●	●	●	●	●	●
FANUC	○	○	○	○	○	○
Siemens 828D	○	○	○	○	○	○
Miscellaneous						
ZF gear box	○	○	○	○	○	○
4th Axis (rotating table)	○	○	○	○	○	○
DDR embedded motor (Mitsubishi system only)	☆	☆	○	○	○	○

Total Production Solution

Highly efficient manufacturing fashion, equipped with high performance control system. The high speed contouring capability can achieve best possible surface quality under most demanding machining cycle time. Highly dynamic five axes machining provides solution for complex tasks.

Heidenhain & Siemens Control System

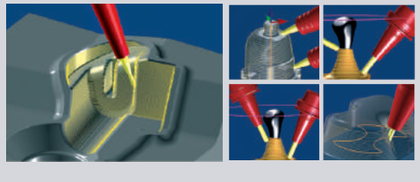
iTNC530 / 840D

Ideal for high-end application CNC system.
Modular, open, flexible operating interfaces are the highlight of the controler.
Programming and visual structure can be integrated with network systems.

Litz Hitech & Open Mind, the CAM compnay The strategic alliances

MST Tools (Japan)

The monitoring & collision test within work range



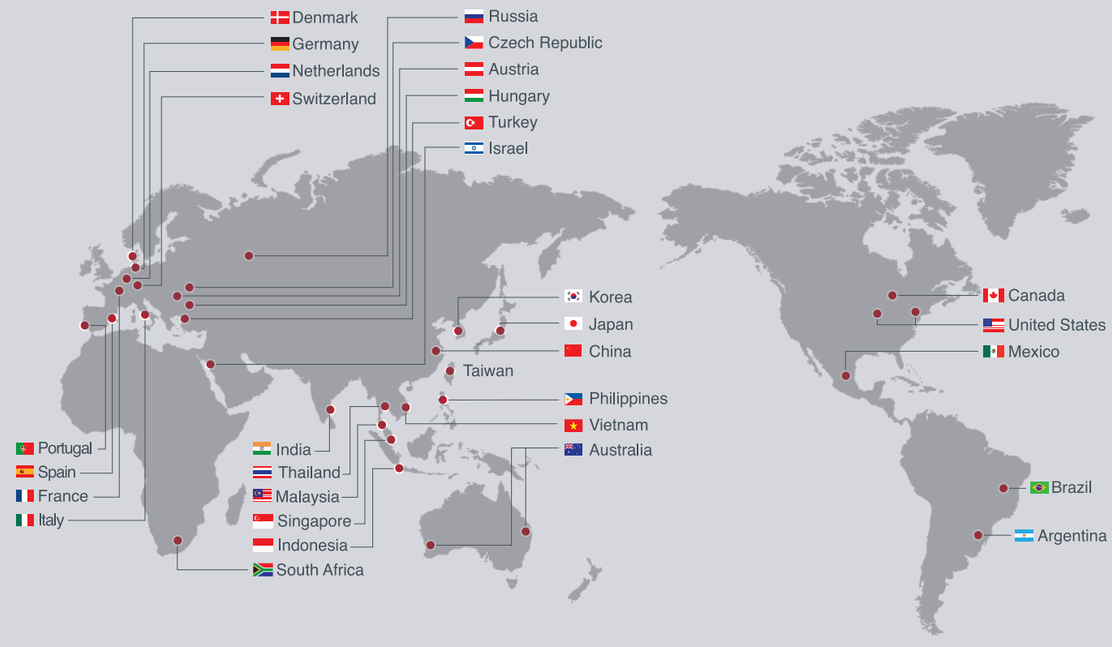
LITZ

Litz Hitech LU Series

5 Axes Series employs U shape base with dual-support A/C axes rotary worktable's high rigidity mechanism. The machine is equipped with 12000RPM direct-drive high speed spindle. High durable roller type linear guideways, 3 axes high precision linear scales along with other high quality components brings out the excellences of the 5 axes simultaneous control. Mill, drill, tap, spiral, irregular and other complex machining can be easily achieved.

Technical Support Global Presence

SALES & DISTRIBUTION NETWORK



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