

### Manufacturer



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Litz Hitech Corp.

### **LU Series**

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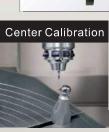
## **Description**

### **ATC Unit**





Maintenance



Structure















LU-620





LU-620

Anti-Collision

Control System

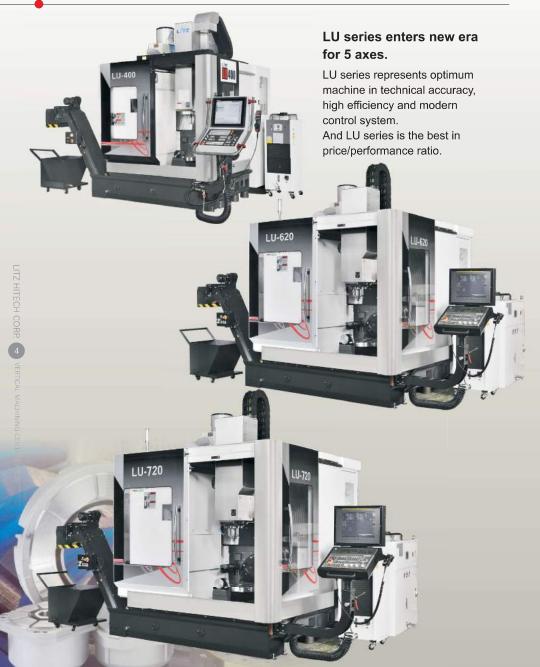




Chip Removal



# LU Series - Vertical Machining Center (5 Axes)



# Powerful 5-Axes Machining / Superior Machining Performance

The design concept for the LU series is to build a simple and standardized reliablestructure, to achieve high quality/powerful 5 axes machining. The high performance cutting capability of the LU series provides a economical 5 axes solution for users in the highly competitive market.



### **High Precision 5 Axes Machining**

LU series is designed for highly efficient production mindset. It is equipped with high performance control system, along with high speed contour control capabilities. Best surface precision can be achieved in the shortest machining time. Highly dynamic performance for 5 axes machining, can provide solution for complex workpiece, and fulfill demands for 5 axes requirement.



LU-620

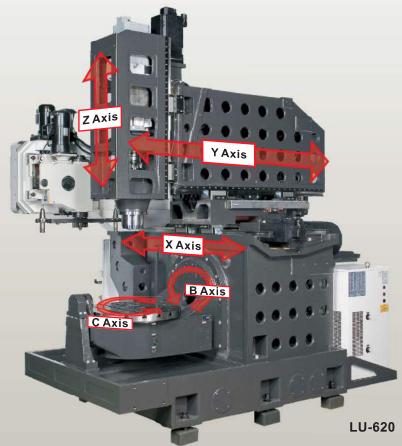
### **Innovative Performance**

- \* Easy entrance into working area.
- \* Great chip removal mechanism.
- \* Ergonomically design.

Servo transmission, linear scales compensation for all axes, and measurement system are either standard or optional equipment.

### **High-Rigidity Structural Design**

LU series 5 axes machining center employs high rigidity casting base to support the swiveling B/C axes. X/Y axes are with cross slider design. The design ensures high machining precision, best quality stability and the highest production efficiencies.



### **Technical Highlights:**

- 1. High efficiency: simple to complex 5 axes machining.
- 2. High precision: X/Y/Z axes + B/C axes with high precision linear scales.
- 3. Powerful cutting spindle: direct drive transmission with torque up to

**34** NM(LU-400), **80** NM(LU-620/720)

4. Magazine: **30**tools(LU400/620/720)

### **High Precision Transmission System**

At the highest level of machining production, linear technology can enhance machining efficiency and precision. The machine sets a new standard by compact structure. Using high technology components enables the high cutting speed, and processes the best repeatability and dynamic performance.



### Optional 3 Axes Linear Scales OP

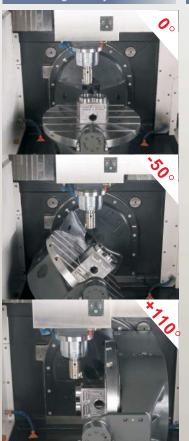


- X/Y/Z axes can be equipped with linear scales, and detects the thermal displacement caused by rapid machine movements. The value of the thermal displacement is being feedbacked to controller for accuracy compensation. The option is best for high precision parts production.
- Linear scales system is equipped with air protection device, to avoid dust and oil-mist pollution, and ensure linear scales accuracy. The device can prolong the lifespan of the linear scales.

### B/C Axes Rotary Table

The 5 axes technology is equipped with linear scales and rotary tables. The dynamic swiveling rotary table can move with high rapid. B axes is 25 RPM, and C axes is **25** RPM, when the table is in worm gear mechanism.

### Tilting/Rotary Table

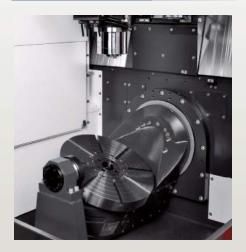


- B axes tilting angle: -50~+110 degrees
- C axes rotating angle: 360 degrees
- B axes and C axes are with each own designated servo motor
- B / C axes worktable max. loading: 200KG (LU400), 300KG (LU620), 500KG (LU720)

### B/C Axes Clamping Force



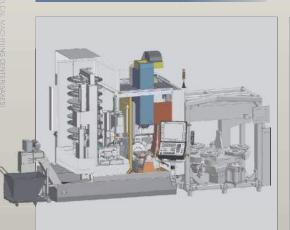
- LU series use high rigid swiveling B / C mechanism to ensure best positioning precision at any angle with 5 axes simultaneous operation. The expanded application range can fulfill the high demand for complex machining.
- B / C axes are with full circle hydraulic brake system, and ensures best reliability.





■ Large diameter table expands space for fixture/jig installation, and expands machining range.

### Six Auto Pallet Change



■ A supporting tailstock setup to ensurebest precision and rigidity when table is loaded.

### Worktable Hydraulic Brake Unit



■ High performance hydraulic module providesbraking system for the worktable, this ensures the worktable's high clamping force at high loading.

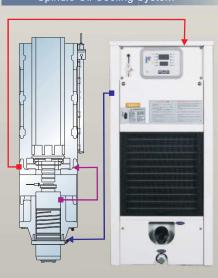
### **Spindle Unit**

Advanced spindle design can highly enhance the cutting efficiencies and surface quality. Especially suitable for mass production and high precision demands

### High Speed Spindle



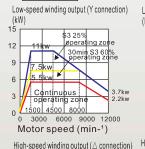
### Spindle Oil Cooling System



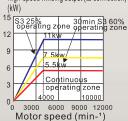
■ Spindle and spindle motor adjusting plate are equipped with oil-cooling system, which can efficiently control thermal changes.

### Spindle Motor



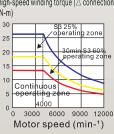


High-speed winding output (△ connection)



0 3000 6000 9000 12000

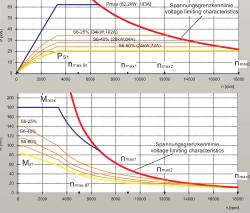
Motor speed (min-1) High-speed winding torque (△ connection)



#### LU-620/LU-720 Heidenhain TNC-640

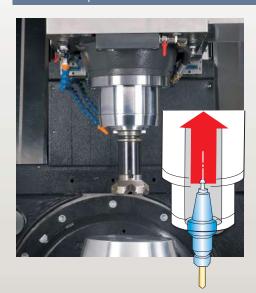
Tabelle 1-476 SINAMICS, 3 AC 400 V, Active Line Module, (ALM), 1PH8107-□□M2□

	n <sub>e</sub> [rpm]	P <sub>N</sub> [kW]	M <sub>N</sub> [Nm]	I <sub>N</sub> [A]	n <sub>mect</sub> [rpm]	n <sub>mex2</sub> [rpm]	n <sub>med</sub> [rpm]	n <sub>max, Br</sub> [rpm]	n <sub>2</sub> [rpm]	M <sub>mex</sub> [Nm]	I [A]	M <sub>o</sub> [Nm]	I <sub>0</sub> [A]
ı	3300	20,0	58	60,0	9000	12000	18000	5000	18050	180	183	82	73
ı	3000	18,0	57	60,0					18050				



### **Machine Oil-Coolant Separation Design**

### Spindle Pull Force

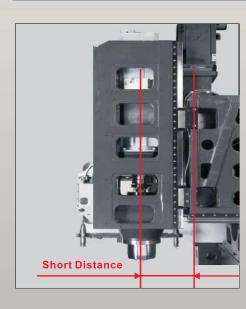


■ Spindle Tool Pulling Force

### 1100kgf (LU-720) 1100kgf (LU-620) 750kgf (LU-400)

- High pull force spindle provides high tool clamping force to enhance tool cutting rigidity.
- Two-sided-constraint-taper-tool is used to enhance the cutting rigidity.

### Spindle Direct Drive Transmission



### IDD is the best anti-heat separation design IDD (Isolated Direct Drive System)

- Direct drive spindle design can separate heat source, and minimize heat displacement to increase precision and tool lifespan.
- Heat separation coupling design in between spindle and motor. The spindle oil cooling control is optional for high precision cutting.
- No belt nor gear transmission, thus backlashes, noises, or vibration can be limited.
- Direct drive spindle can enhance motor efficiency, high quality rigid tapping can be performed.

### **ATC and Magazine Unit**

### Magazine Unit

Magazine capacity is 30T(LU-400/620/720) 48T(LU-400/620/720) op 60T(LU-620/720) op

Tools can be loaded or unloaded during cutting.

### **ATC Control**





### 30T(LU-400/620/720)



■ Arm-type tool changing mechanism and magazine on the left side of the machine. This can reduce the time for preparing the tools. Auto door for the ATC can also prevents the chips from getting into the ATC unit.

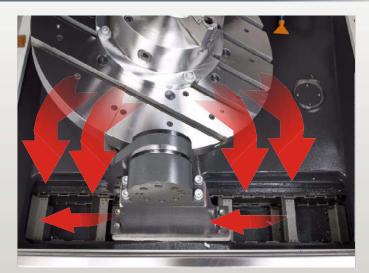
### Arm-type Tool Changing System



- Rapid tool changing arm, T to T: 5 sec
- CAM type indexing mechanism, for high precision and low maintenance.
- Light ATC arm, for low inertia and low loading.

### **Highly Efficient Chip Removal Mechanism**

### Chain-type Chip Removal System



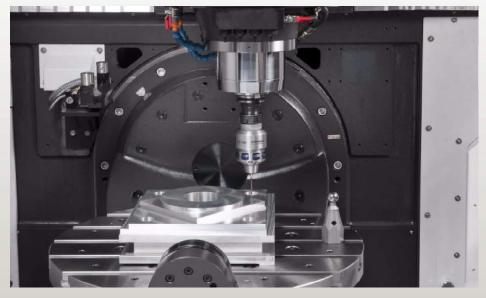
In the chip removal function, the highly efficient and simple designed mechanism can handle large amount of coolant to the chip conveyor. And from the chip conveyor, the chips are transported to the chip cart on the left side of the machine. This mechanism makes it easy and convenient to handle the chips.

### Chip Cart



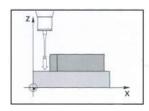


### Infrared Workpiece Measurement ©

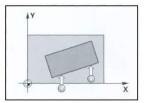


### Highlights:

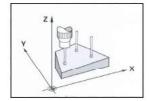
- Workpiece can be clamped at any position.
- Probe can detect uneven / unparallel surface for holes or surfaces.
- CNC coordinate compensation.



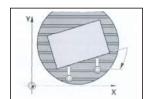
Measure any points on any axes



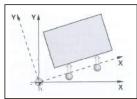
Linear tilting angle



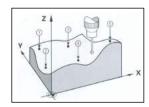
Surface tilting angle



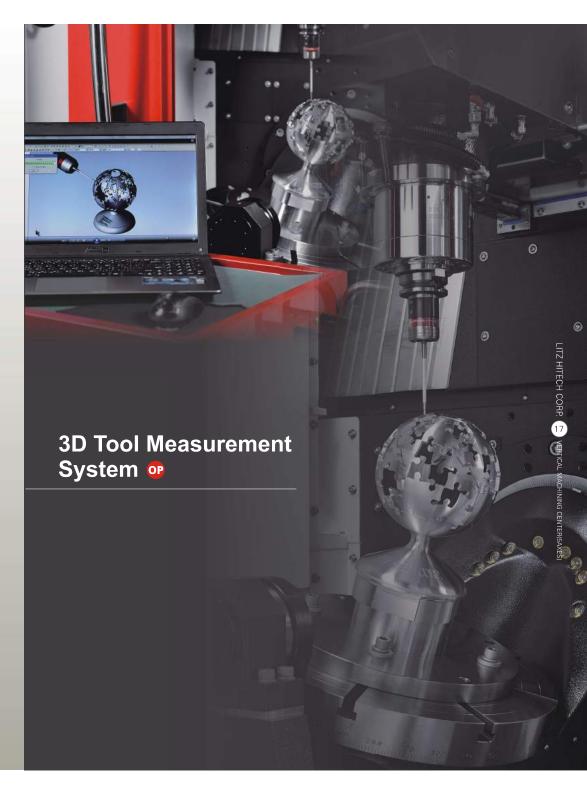
Compensate uneven value through rotating table



Compensate uneven value through coordinate's basic rotation



Measure curves



LU-620

### Tilting Axis Linear Scales



■ B Axis Tilting Axis with Rotating Linear Scale.

#### C Axis Encoder



C Axis with Heidenhain High Precision Rotating Encoder.

### Center Calibration Function OP



### Rotary Axis Laser Measurement





■ Worktable Center Calibration w/ Heidenhain TS740. High Precision Touch Probe & Standard Calibration Ball with Heidenhain Measurement Software can detect error value of the worktable and compensate to ensure Worktable Precision.

### Tool Unloading & Loading & Maintenance Doo



■ Magazine with maintenance door, easy for loading and unloading tools, for easy maintenance.

### Convenient Access for Maintenance

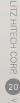


■ Hydraulic tubes are centralized at the rear of the machine for easy maintenance.

### Electric System For Easy Maintenance



- Electrical cabinet are in compliance with CE regulation, to ensure control system can be free of interference.
- High performance controller, with systemized development and internet connection to fulfill demand for high speed high precision.
- Electrical cabinet is equipped with heat exchanger unit FANUC for stable control operation, air cooler can be an option



### **High Performance Design Setup**

### Safety Door System



- When safety door is not closed, program cannot start to ensure operator's safety.
- When door is opened during machining, program will stop for safety pre-caution.

### Disc Type Oil Coolant Separator



- Disc type oil-coolant separator for easy installation and low space occupation.
- Disc type oil-coolant separator can separate the floating oil in the tank to ensure coolant quality and lifespan, andfurther ensure the machining quality.

### Lighting System



- High brightness work light is standard for easy loading and unloading work from the table.
- Worklight is anti-explosion, waterproof, anti-dust.
- Parts are easily accessible for the work light.

### Hydraulic & Lubrication System(LU-620)



■ High quality components are used for hydraulic & lubrication system is used to ensure reliability of the machine.

### **Extra Large Operating Room & Oil Mist Collecting**

### Shaft-type Chip Guard



### Oil Mist Collector Unit OP





- Fully enclosed enclosure and oil mist collector can efficiently collect the dustand oil-mist during machining to avoidhazardous particles are inhaled.
- High precision parts can be producedin a clean environment to comply withdemands for green technology.

### Ultra Large Machining Space



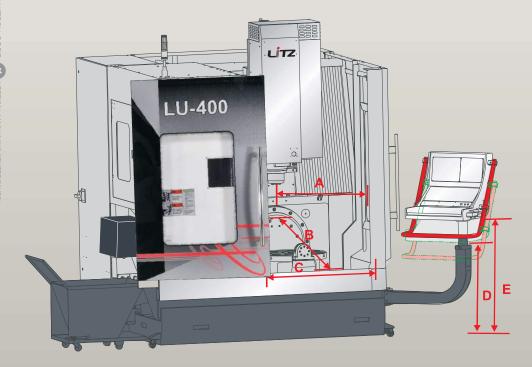
■ Large machining room with small interference area.



### **Ergonomic and Space Saving**

### Approachable Distance

Item	unit	Section	LU-400	LU-620	LU-720
Distance Between Operator & Spindle	mm	А	315-665	305-825	400-1100
Distance Between Operator & Worktable Center	mm	В	490	565	700
Door Opening Size	mm	С	900	1000	1050
Controller from the Floor	mm	D	870	900	870
Controller from the Floor (Highest)	mm	Е	970	1000	970



### **Operating Convenience & Accessibility**

### Operating Convenience (LU620)





Document and compartment OP

Movable control cabinet

### Operating Convenience (LU400)



• Adjustable opertation panel: it can be operated in front of the machine or at the right-side of the machine. The height of the operation panel can also be adjusted to best-suited the hight of human body.

### Ergonomically Design Control Panel

Providing best operating comfort for the operator. Height is 0.90m to 1.10m.

### High Performance Software System

Heidenhain TNC640 (5Axes Simultaneous) Heidenhain TNC620 (4+1Axes) 3D Software 15" TFT Technology User Self-Definition Software (SOFTKEY) **SMARTNC** FANUC 0iMF (4+1 Axes)

### Highlights

High performance control system is the best for high demand machining requirement. LU Series' superior advantage and high performance can fulfill the user requirement from mass production to high speed machining, and to mold making.

### Safety Control

Safety technology is in compliance with CE regulation and ECN electrical safety regulation.

### Alarm Message Software

Improved operability to reduce error. Remote capability ensures faster technical support in programming and operability.



### **Control System Unit**

Equipped with Fanuc / Heidenhain for the most modern 5Axes control system. The innovative software function improves the precision and production efficiencies. The equipped Ethernet port can also provide quick external connect.



Anti Collision Software System TNC640 ONLY)

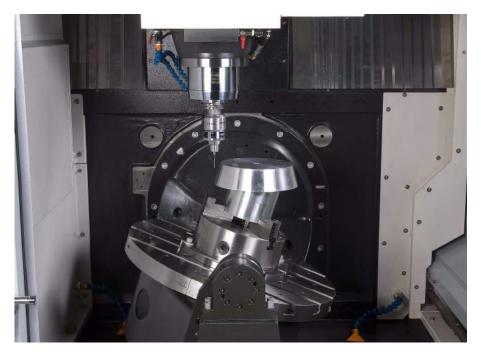


Anti Collision (TNC640 ONLY)



### **High Accuracy Machining Test**

The Dynamic Cutting Test should be executed for the LU-Series 5-Axis Machining Center according to NAS979 standard in order to inspect the high-accuracy performance of the machine.



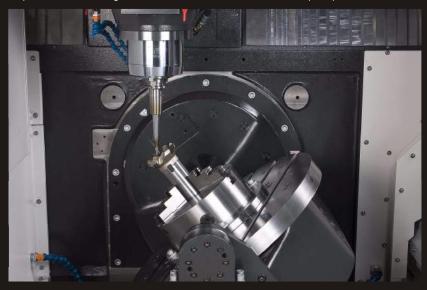
Roundness (when inhibiting 5 axes at the same time) (NAS 979 standard)	Cutting conditions:					
90°	Cutting Object (JIS)	A7075 (alu. Alloy)				
	Tool	Ultra-hard End-mill Tool - Ø 40mm (double- edge Tool)				
180	Spindle Speed	2000 rpm				
	Milling Speed	2000 mm/min				
270° 5 μm	Workpiece Dimensions	Ø216mm xØ250mm x 63.5mm (H)				



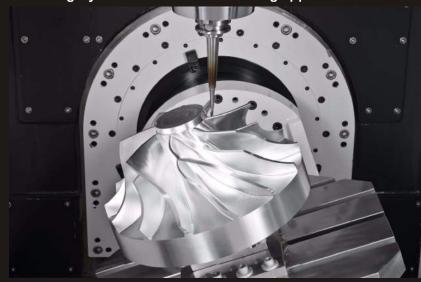
### **5 Axes Cutting Application**

### **One Clamping for Complex Parts**

Heidenhain and Fanuc controller can be equipped for LU Series. Both are most advanced and precise 5 Axes controller in the market. The most optimized machining solution can fulfill demand for all complex parts.



Highly efficient 5 axes machining application.



### **CAM Solution to High Efficient Manufacturing**



### STRATEGIC ALLIANCE BETWEEN LITZ HITECH AND OPEN MIND. THE CAM FORCE



# **PowerMILL**

A leading brand in 2-5 axis high-speed machining CAM System



Being a leader in 2~5 axis high-speed machining CAM System, the PowerMILL is affirmed by the market in its operability, efficiency and functionality.



Highlight

Control technology

Summary

Technical parameters

Complex processing technolog

 $(Ra < 0.1 \mu m)$ .







- 1. Flexibly integrated laser beams through the main axis of HSK-A63 connector
- 2. The beehive texture of injection mold for steering cover with laser processing
- 3. The injection mold for dashboard storage box cover with leather surface texture



### Ultrasonic processing technology

Significantly increase the productivity With the ultrasonic processing technology of Litz, special materials in the industry can be economically processed regardless of their special shapes, such as precision ceramics, glass quartz, aluminum oxide, tungsten steel, super-alloy or complex materials. The high-frequency microamplitude at the front end of cutlery is caused by the ultrasonic resonance effect and rotation super-position of the cutlery. On the basis of workpiece requirements, the ultrasonic processing technology will be able to achieve a higher feed rate, a I onger cutlery lifespan and significantly improve the workpiece surface roughness

Litz's ultrasonic processing technology has been continuously improving based on the demands of the market. The applied processing fields in Litz's ultrasonic processing modules cover the most advanced difficult-to-process materials and reinforced-fiber complex materials.

### The advanced and difficultto-process materials

### Precision ceramic

Liaht weiaht Excellent corrosion resistance and heat resistance Excellent wear resistance

### Quartz glass

Transparent color Heat and shock resistant Good chemical stability and electrical insulation

#### Nickel based alloy

Excellent corrosion resistance Excellent compressive intensity and antioxidant

#### Glass fiber

High intensity High elasticity and light weight











- 4. Flexibly integrated ultrasonic processing technology through the HSK-A63/HSK-A100 connector
- 5. The thin and lightweight structural optics parts, such as glass ceramic parts 6. Silicon nitride camera case with sky detection
- 7. Deep hole drilling for the drive shaft in MnCr

### Integrated ultrasound technology

The integrate ultrasonic and milling process technology for machine tool is able to provide a wider range of processing materials to users

Ultrasonic processing is an innovative technology for manufacturing complex geometries of high-tech materials that brings incredible rotation speed and can be applied to almost all various fields. The difficult-to-process and highperformance materials can be economically processed and high quality can be achieved, with the kinematics superposition of cutlery rotation and additional axial vibration. The processing of thin buttress in lower processing cutlery significantly reduces minor-cracking of the materials and extending the lifespan of the cutlery. Depending on the materials characteristics, an excellent surface glossiness of Ra < 0.1µm can be achieved.



### The principle of work

The cutlery rotates through the connector of HSK-E32/HSK-E40/HSK-E50/HSK-A63/HAS-A10, and rotates reciprocally in superposition with the ultrasonic additional vibration along axial direction (piezoelectric effect).

### Highlight

- +Economical grinding, milling and drilling for advanced materials which are hard, fragile and difficult-to-process
- +The whole new and more robust ULTRASONIC HSK, with a higher amplitude power for high productivity, high surface quality and precision, and longer lifespan of the cutlery
- +Automatic detection and track the ultrasonic frequency and amplitude



Magazine Capacity: 120T

Max. Tool Length1~24T: 250mm 25~120T: 160mm

Max. Tool Weight: 7Kg

X/Y/Z Axes Travel:400/350/350mm

Worktable Size: Ø450mm

Max. Worktable Loading: 150kg

Number of Pallets:6

APC Worktable Size: 350 x350mm

APC Worktable Loading: 100kg





Magazine Capacity: 220T

Max. Tool Length1~200T: 250mm

Max. Tool Weight: 7Kg

X/Y/Z Axes Travel: 620/520/460mm

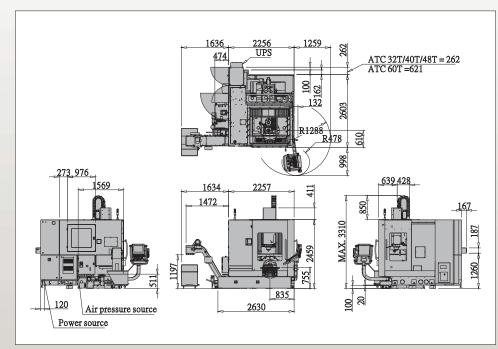
Worktable Size: Ø650mm

Max. Worktable Loading: 300kg

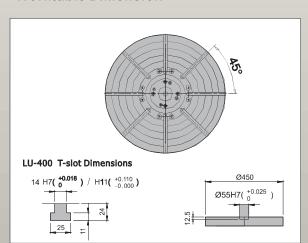
Number of Pallets:8

APC Worktable Size: 350 x350mm

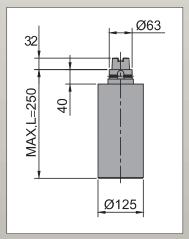
APC Worktable Loading: 100kg



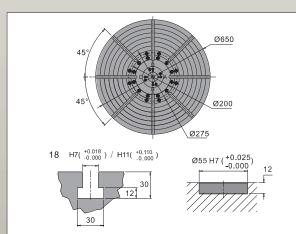
### **Worktable Dimension**



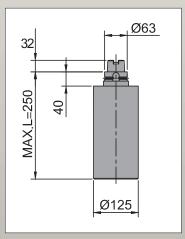
### Tool Spec (HSK 63A)

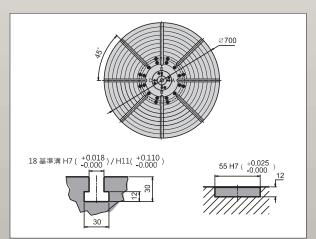


### **Worktable Dimension**

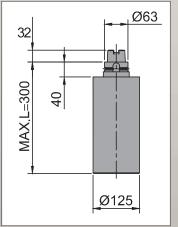


### Tool Spec (HSK 63A)

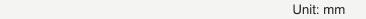


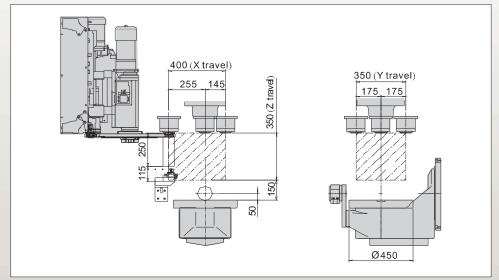


Tool Spec (HSK 63A)

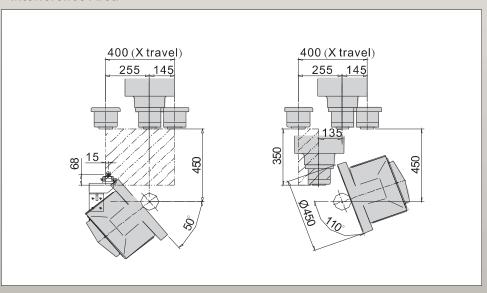


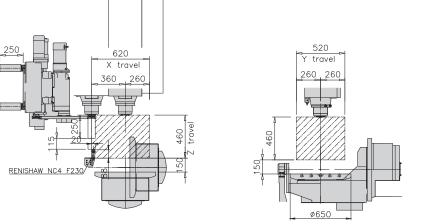
**Cutting Area** 





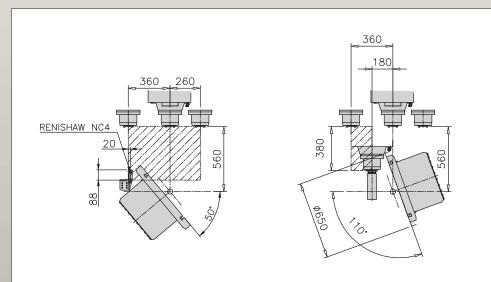
### **Interference Area**





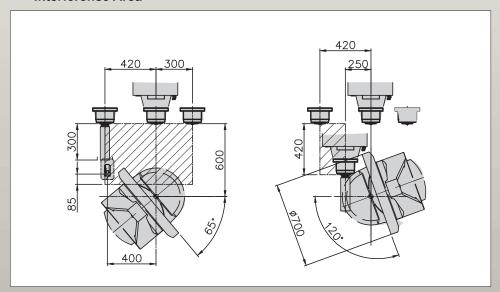
X travel 720 600 Y travel ø700

### Interference Area



### Interference Area

**Cutting Area** 



Unit: mm

### **Machine Specification**

Model		LU-400	LU-620	LU-720		
Travel						
X/Y/Z Axes Travel	mm	400/350/350	620/520/460	720/600/500		
B Axis Tilting Range		-50° ~ +110°	-50° ~ +110°	-65°~+120°		
C Axis Rotating Range		360°	360°	360°		
Spindle Nose to Table Surface	mm	150~500	150~610	150~650		
Spindle						
Spindle Transmission Type		Direct Drive	Direct Drive	Direct Drive		
Tool Shank		ISO 40	ISO 40	ISO 40		
Spindle Speed	rpm	12000	12000	12000		
ATC						
Magazine Capacity	Т	30	30	30		
Taper		HSK 63A	HSK 63A	HSK 63A		
Max. Tool Length	mm	250	250	300		
Max. Tool Diameter (No Adjacent Tool)	mm	Ф75 (Ф127)	Ф75 ( Ф127)	Ф75 ( Ф127)		
Motor						
Spindle Motor (Cont./30mins)	Kw	5.5/7.5(FANUC)	18 / 21(Siemens)	18 / 21(Siemens)		
X/Y/Z Axes Motor Power	Kw	4.5 / 2.7 / 4.5(FANUC)	6.5 / 4.5 / 6.5 (Heidenhain)	6.5 / 4.5 / 6.5 (Heidenhair		
B/C Axes Motor	Kw	7 / 2.7 (FANUC)	8.6 / 4.5 (Heidenhain)	8.6 / 4.5 (Heidenhain)		
B/C Axes						
Worktable Size	mm	Ф450	Ф 650	Ф700		
Center Hole Size mm		Φ55H7X12 in depth	Φ55H7X12 in depth	Φ55H7X12 in depth		
T slot type mr		T14Radial Type 8 Slots	T18 Radial Type 8 Slots	T18 Radial Type 8 Slots		
Max. Workpiece Size m		Φ430x(50+R389)	Φ580x(50+R438)	Ф700x(50+R438)		
Max. Worktable Loading	kg	200	500	500		
Rapid Travel						
X/Y/Z M/min		48/48/48	36/36/36	30/30/30		
B/C rpm		25	25	25		
Cutting Feedrate mm/min		1-20000	1-20000	1-20000		
Control						
Туре		FANUC 0iMF	HEIDENHAIN	I TNC 640		
Miscellaneous						
Machine Weight kg		6000	8800	9500		
Coolant Tank L		220	240	300		
Dimension (L*W*H) mm		4126x2723x3013	3863x2730x3310	4963×2915×3005		
Power Requirement	KVA	20	25	25		
Air Source kg/cm² (ɛ/min)		6(1600)	6(1600)	6(1600)		

<sup>■</sup> Pictures in this catalog are for reference only.

## **Optional List**

Lubrication System

Automatic Grease Lubrication (X/Y/Z)

				Standard ○Optional ☆Inquir	y Neede	edN	Not Availa	
Spindle	,400	1.6 <sub>20</sub>	U.720	Coolant Oil Separator	\$00	620 •	1.720	
Direct Drive Spindle 12000RPM			•	Disc Type Coolant Oil Separator	$\circ$		0	
Direct Drive Spindle 15000RPM	0	0						
Spindle Oil Cooler				ATC Unit				
Spindle Motor Plate Cooling System				ATC				
Coolant Through Spindle (CTS)	0	0		Taper BBT40				
Spindle Air Seal System				Tool Capacity 30T	•		•	
Cooling System				Tool Capacity 48T	0	0	0	
Spindle Programmable Air Blow		•	•	Tool Capacity 60T		0	0	
Spindle Splash Ring		•	•					
Coolant Cooling System	<u> </u>	$\overline{}$	0	3Axes Transmission				
				3Axes Roller Type Linear Guideways		•		
Chip Removal				3Axes Linear Scales	0	0	0	_
Chip Auger				B Axis Linear Scale	•	•	•	
Chain Type Chip Conveyor	0		•	C Axis Linear Scale				
Chip Cart			•	Z Axis Motor System w/ Brake			•	
Water Gun								
Air Gun			•	Electrical				
Flush Device	0	0		Worklight	•	•		
Top Enclosure	0	0		Alarm Light	•			
Full Enclosure		•	•	M30 Auto Shut Off		•	•	
Managerament Custom				Heat Exchanger	•	•	•	-
Measurement System	0	☆○	<del>~~</del>	Air Conditioner	0	0		-
Laser Tool Length Measurement				Control				
Touch Type Tool Length Measurement TT140				Fanuc 0iMF (4+1)				-
Wireless Workpiece Measurement TS640	0			HEIDENHAIN TNC-620 (4+1)				-
Worktable Unit				HEIDENHAIN TNC -640 (5 axes simutaneous)		$\overline{}$		-
Worktable Tailstock Support	•	•	•	SIEMENS 840Dsl (5 axes simutaneous)	$\overline{}$			-
Air Outlet for Fixture	☆0	☆○	☆○	Transformer	☆()	☆○	☆○	-
Large Table 700mm			•	Anti Collision Software	☆○	☆0	☆○	-
Large Table 650mm		•			☆○	☆○	☆○	-
Large Table 450mm				Center Calibration Function	W O	W O	- M O	-
Safety System				Miscellaneous				
Front Door/Side Door Safety Switch				Oil Mist Collector	0	0	0	
	0	<u> </u>		Rotary Window	0	0	0	
CE	<u> </u>			Thermal Compensation	☆○	☆0	☆○	

<sup>■</sup> Litz reserves all rights to change the appearance or to suspend the specifications or options of machines.

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# **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.



dual-support A/C axes rotary worktable's high rigidity mechanism. The machine is equipped with 12000APM 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.

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