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LU400/620

5-Axes Machining Centers

MITSEIKI

2015.A

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Description

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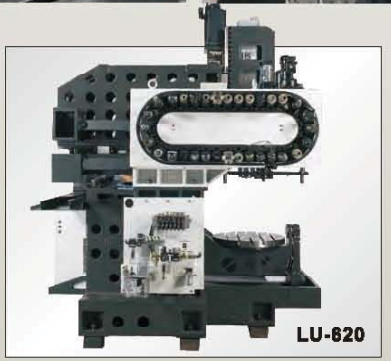


Application

Transmission

Heat Displacement Control

B/C Axes

Chip Removal

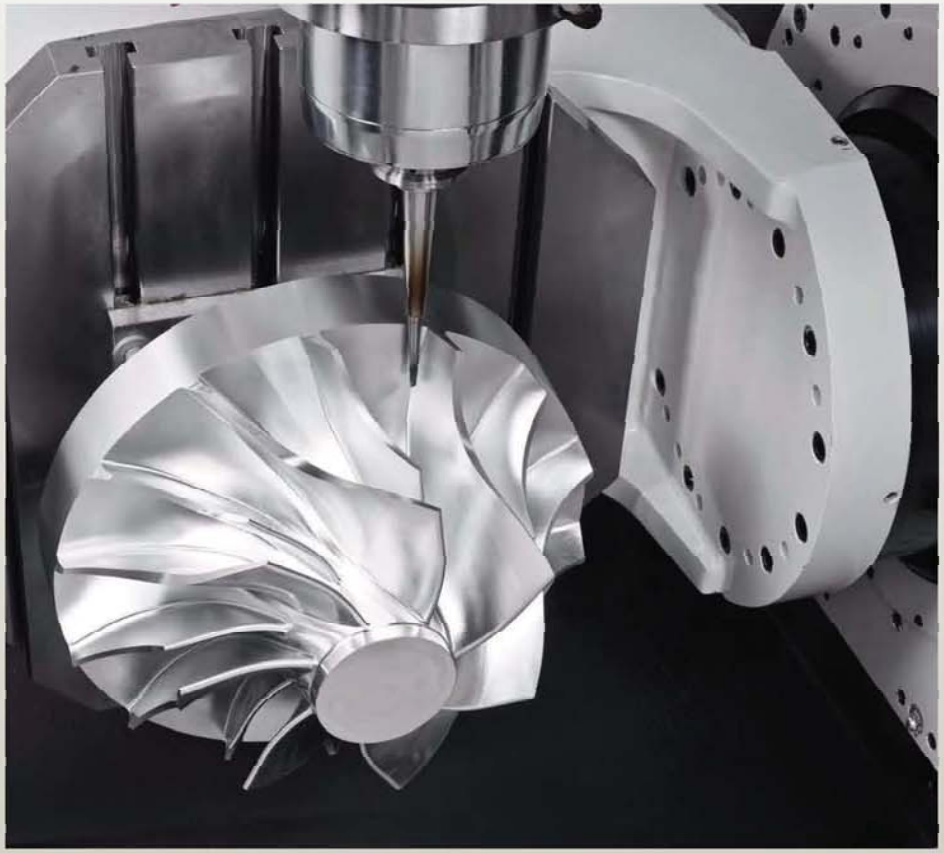
LU Series -
Vertical Machining Center (5 Axes)

LU series enters new era for 5 axes.

LU series represents optimum machine in technical accuracy, high efficiency and modern control system.
And LU series is the best in price/performance ratio.

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 performancecutting capability of the LU series provides a economical 5 axes solution forusers 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.

LU-620

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

80NM (LU620) , **46** NM (LU400).

4. Magazine: **32** tools (LU620), **30** tools (LU400) capabilities.

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.

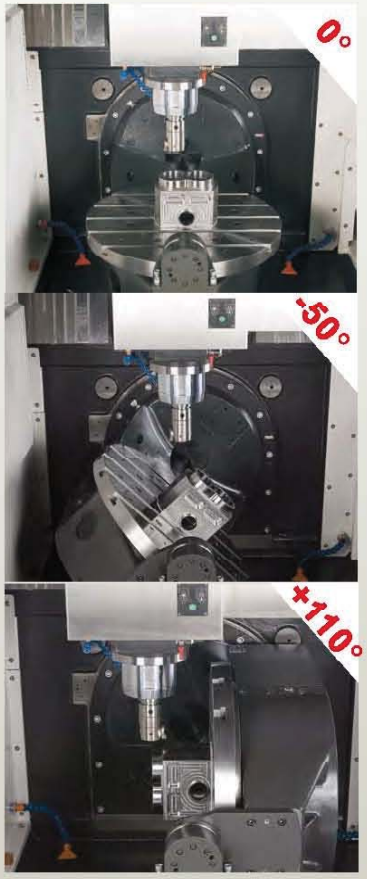
Optional 3 Axes Linear Scales OP

- 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)

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.

Worktable & Supporting Tailstock

LU400 Rotary Table

LU620 Rotary Table

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

Worktable Supporting Tailstock

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

Worktable Hydraulic Brake Unit

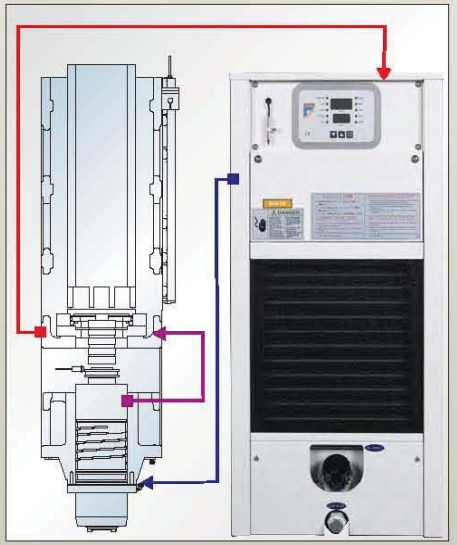
■ High performance hydraulic module providesbraking system for the worktable, this ensures the worktable's high clamping force at high loading.

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

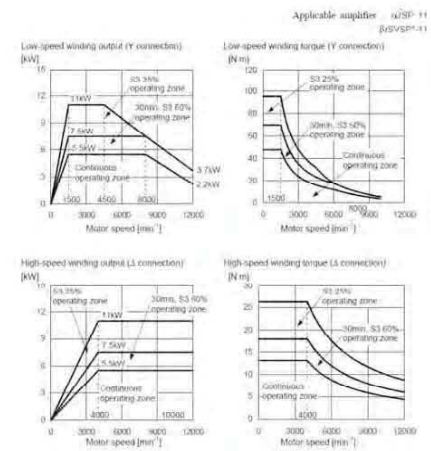
Spindle Oil Cooling System



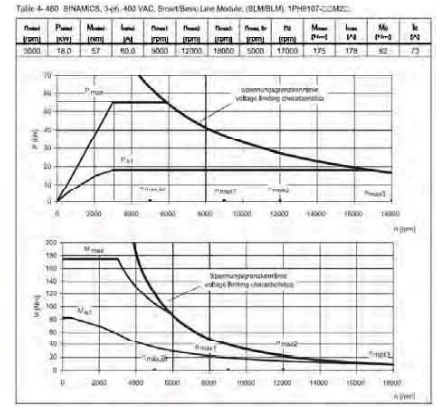
■ Spindle and spindle motor adjusting plate are equipped with oil-cooling system, which can efficiently control thermal changes.

Spindle Motor

LU-400 **FANUC 0iMF**



LU-600 **Heldenhain iTNC530**



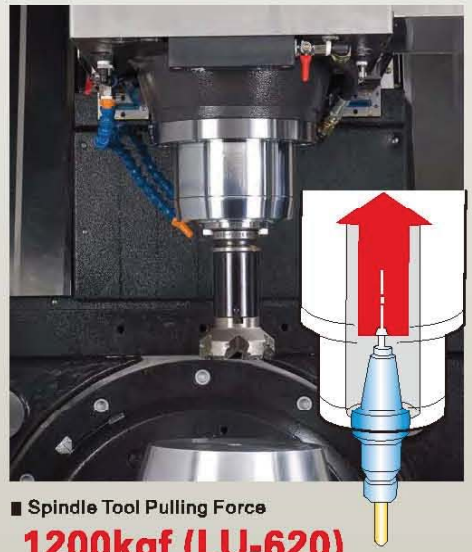
Machine Oil-Coolant Separation Design

Lubrication Guiding Groove

Oil-Coolant Separation Tank OP

■ The machine is designed with oil-coolant design. By separating the lubrication oil and cutting coolants, coolants can be recycled without deterioration, which will further affects the machining quality.

Spindle Pull Force



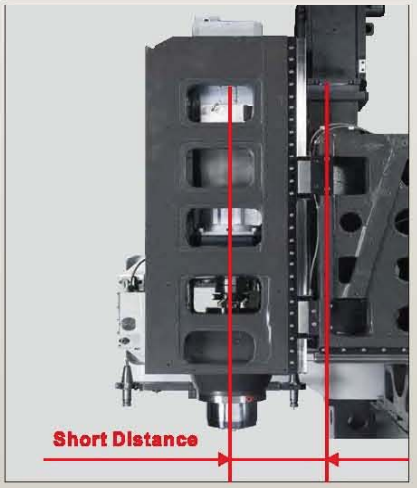
■ Spindle Tool Pulling Force

1200kgf (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

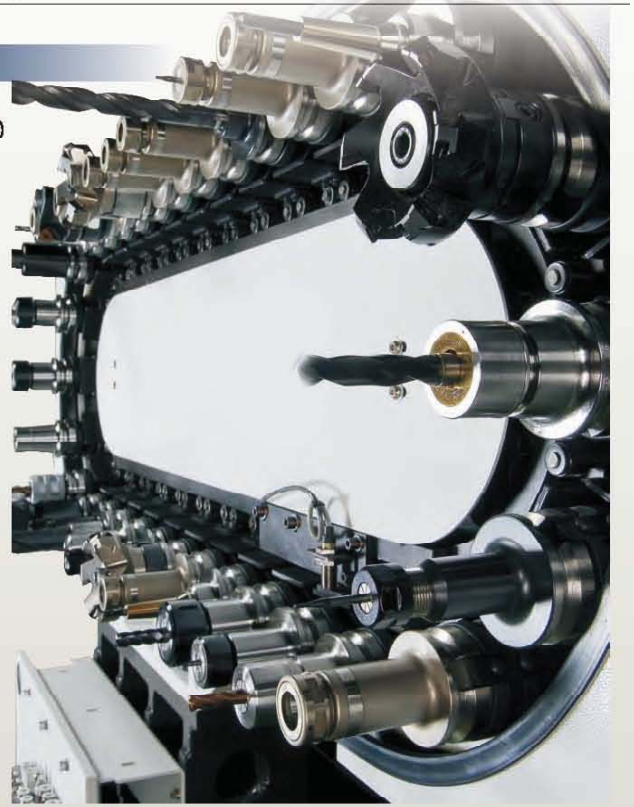
IDD (Isolated Direct Drive System)

■ 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 32T (LU620) and 30T (LU400).
Tools can be loaded or unloaded during cutting.



ATC Control

LU-400 (30T)

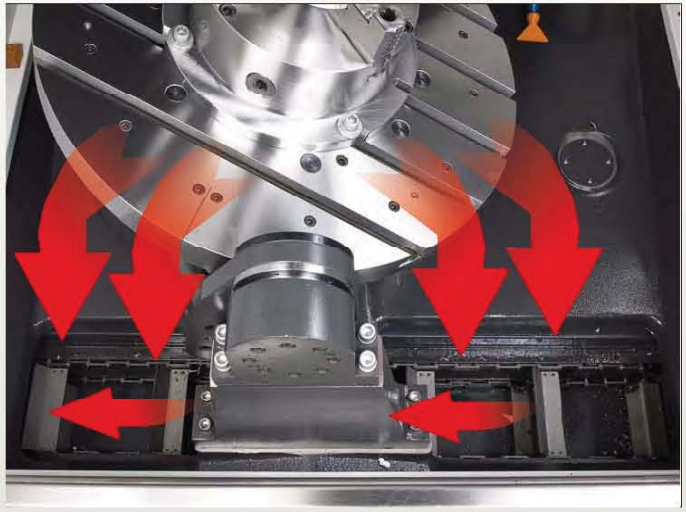
■ Arm-type tool changing mechanism and magazine on the left side of the machine. This can reduce the time for preparing the tools. Auto door for the ATC can also prevents the chips from getting into the ATC unit.

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

Laser Tool Measurement System OP

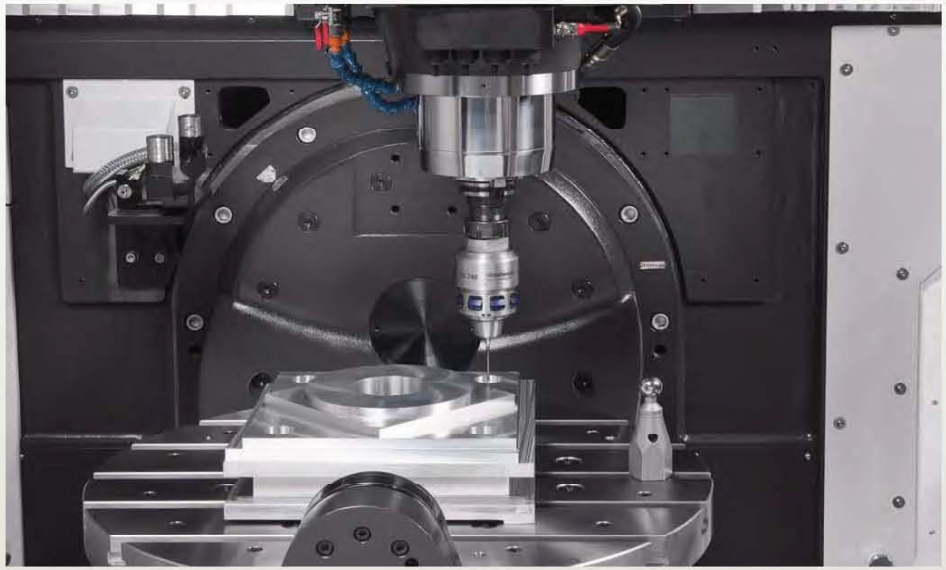
The continuous monitoring of the tool data can detect the breakage/damage/wear of the tool. This can ensure the consistent production quality, and avoid damages.

Laser measurement system can ensure high quality precision.

Advantages:

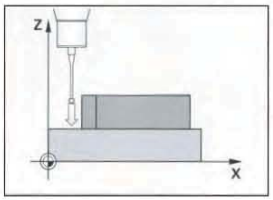
* **Reduce non-production time.**
* **Fully automation.**
* **Low defective rate.**
* **High production efficiency.**
* **High production quality.**

Infrared Workpiece Measurement OP

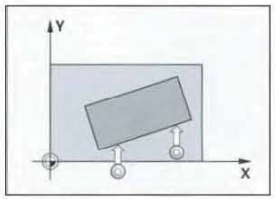


Highlights:

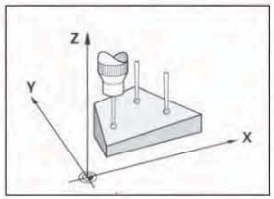
- Workpiece can be clamped at any position.
- Probe can detect uneven / unparallel surface for holes or surfaces.
- CNC coordinate compensation.



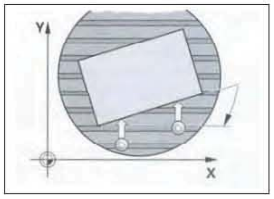
Measure any points on any axes



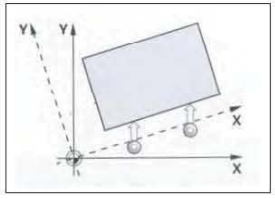
Linear tilting angle



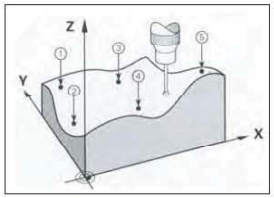
Surface tilting angle



Compensate uneven value through rotating table



Compensate uneven value through coordinate's basic rotation



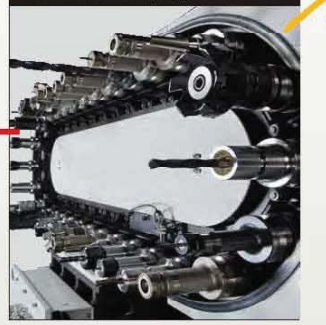
Measure curves

3D Tool Measurement System OP

5 Axes Simultaneous Movement Structure

LU-620

ATC Tool Changing Mechanism



Transmission System

B, C Axes Worktable

Worktable Tailstock Support

LU Series

Controller:
Heidenhain iTNC530
(5 Axes Simultaneous)
or Fanuc 0iMF
(4 Axes Simultaneous + 1)

Spindle Direct Drive 12000RPM

X/Y/Z Axis + B/C Axis

Worktable Tailstock Support

Cross Slide Design (X/Y Axes)

Magazine 30T (LU400)
32T (LU620)

Chain Chip Conveyor

Spindle Direct Drive Transmission

High Precision Measurement System

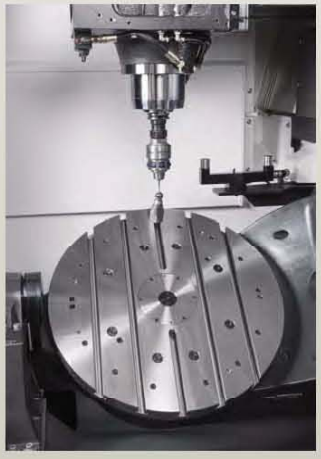
Tilting Axis Linear Scales OP

■ 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.

Easy and Simple Maintenance Design

Tool Unloading & Loading & Maintenance Door

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

Convenient Access for Maintenance

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

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.

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.

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.

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

Top Enclosure OP

- When oil mist coolant is used during machining, top enclosure can be used with oil mist collector for improved air quality in the facility.

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.

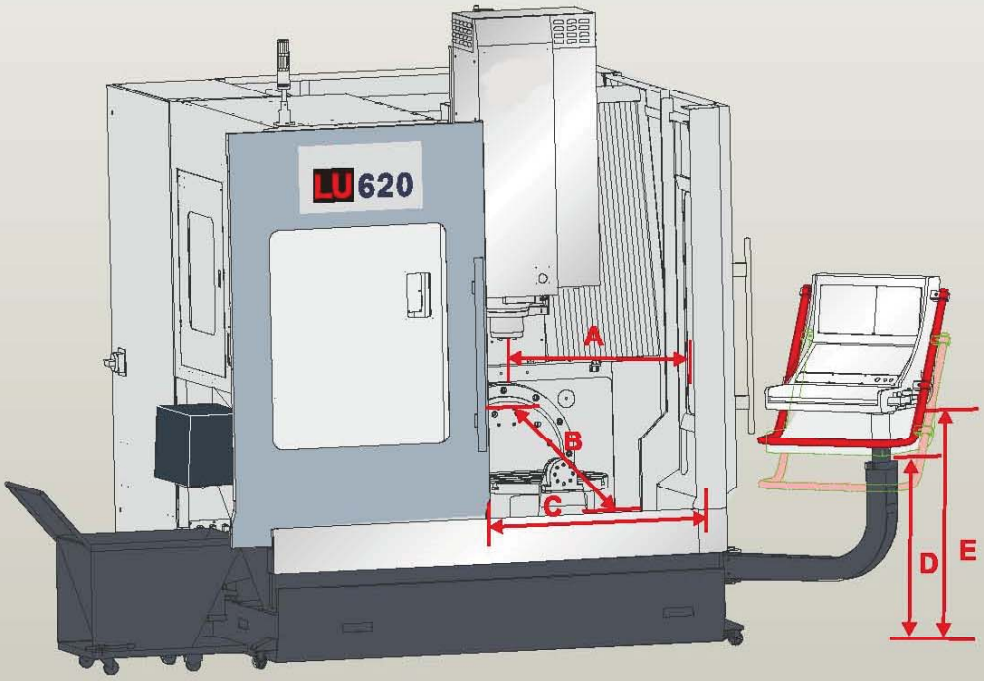
Ultra Large Machining Space

- Large machining room with small interference area.

Ergonomic and Space Saving

Approachable Distance

Item	unit	Section	LU-400	LU-620
Distance Between Operator & Spindle	mm	A	315-665	305-830
Distance Between Operator & Worktable Center	mm	B	490	565
Door Opening Size	mm	C	900	1000
Controller from the Floor	mm	D	870	900
Controller from the Floor (Highest)	mm	E	970	1000



Operating Convenience & Accessibility

Operating Convenience (LU620)

● Document and compartment

● 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.

User Friendly HMI

Ergonomically Design Control Panel

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

High Performance Software System

Heidenhain iTNC530
(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.

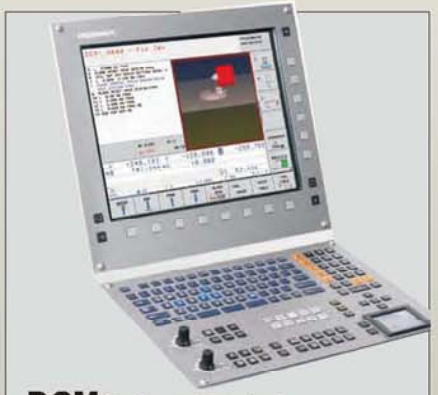
Alarm Message Software

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 (iTNC530 ONLY)



DCM(Software Function)
Dynamic Collision
Monitoring for iTNC 530

Anti Collision (iTNC530 ONLY)

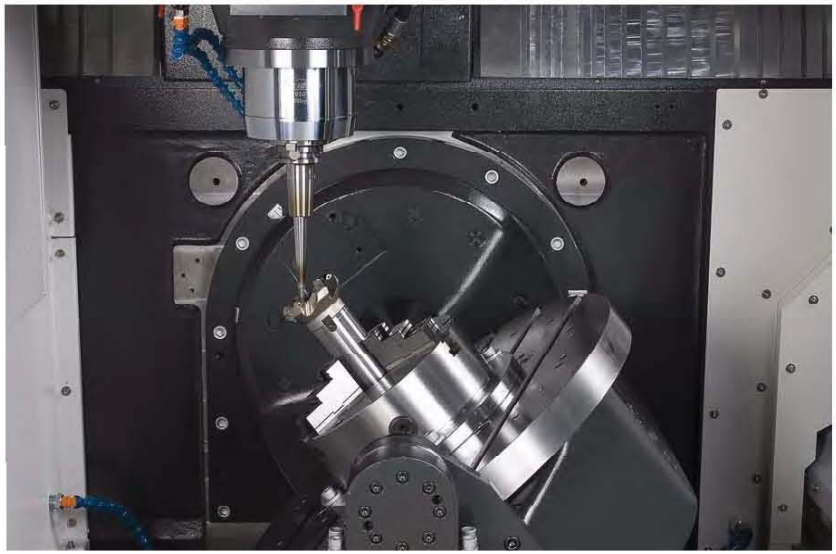
Application

Wheel Tire Mould

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.

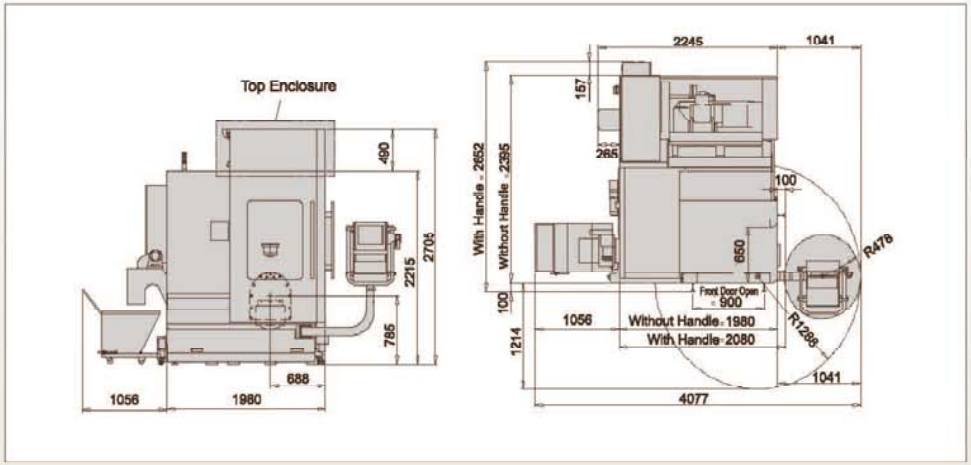


Highly efficient 5 axes machining application.

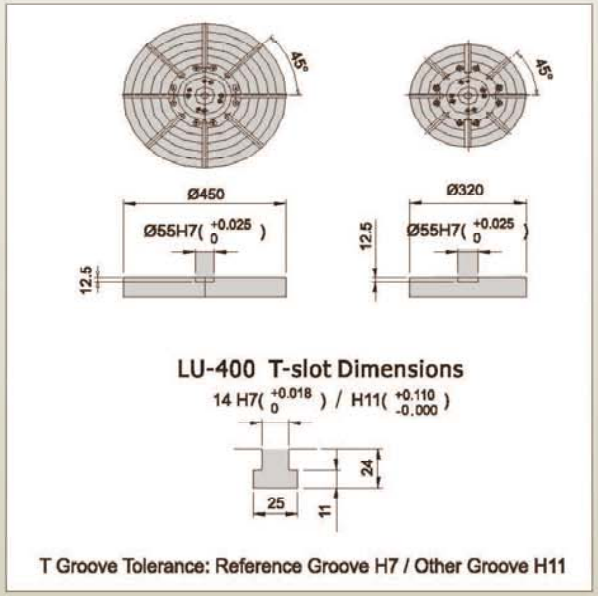
Dimension & Cutting Range LU400

Appearance & Dimension

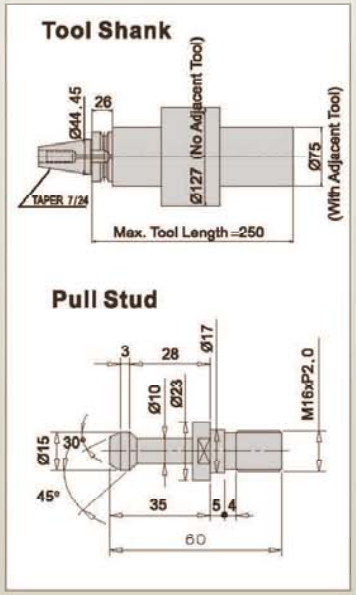
Unit: mm



Worktable Dimension



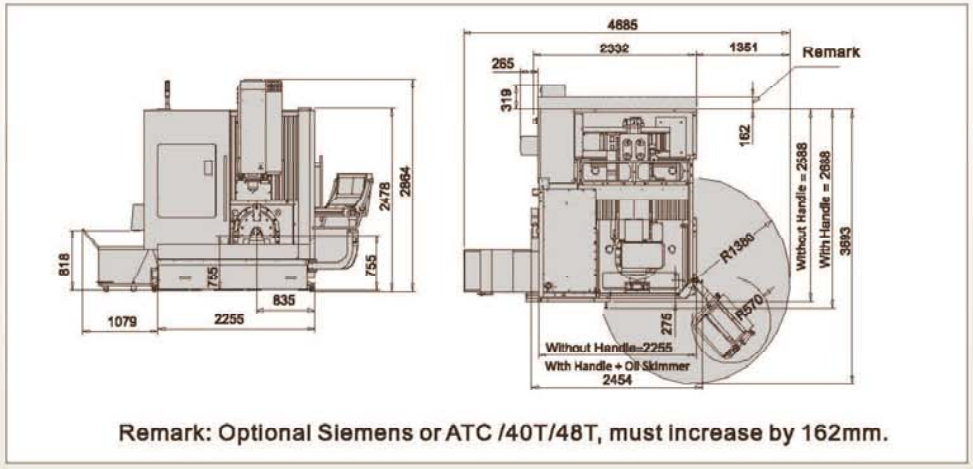
Tool Spec



Dimension & Cutting Range LU620

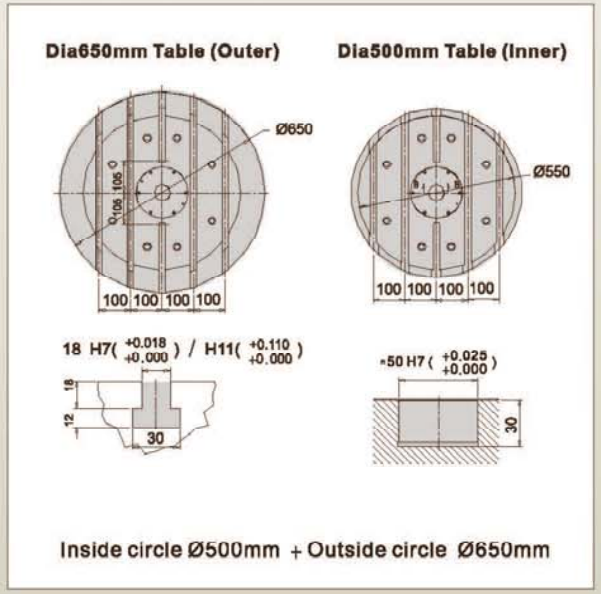
Appearance & Dimension

Unit: mm



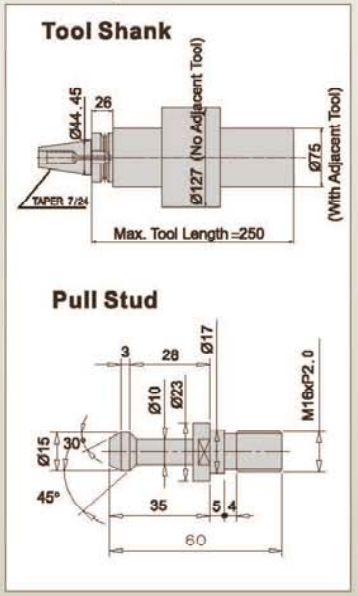
Remark: Optional Siemens or ATC /40T/48T, must increase by 162mm.

Worktable Dimension



Inside circle Ø500mm + Outside circle Ø650mm

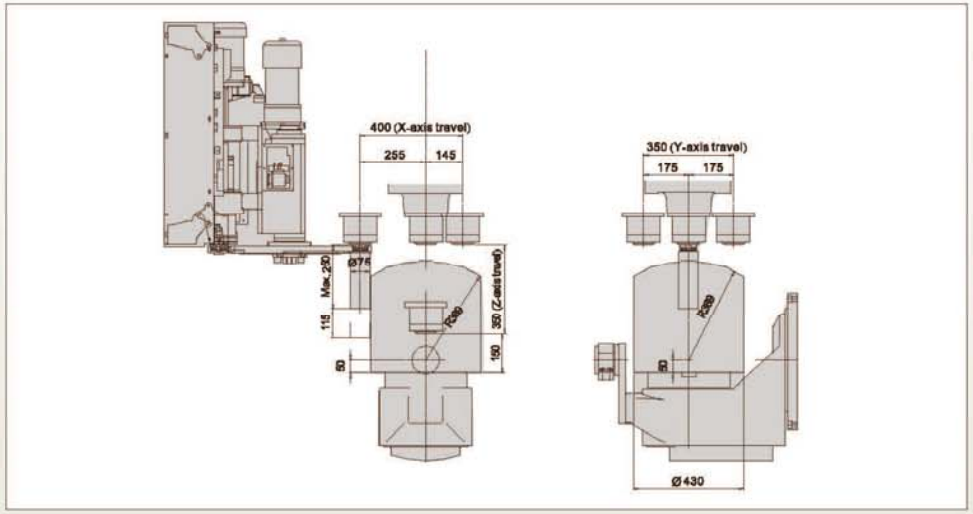
Tool Spec



Cutting Area & Interference Area (LU400)

Cutting Area

Unit: mm



Interference Area

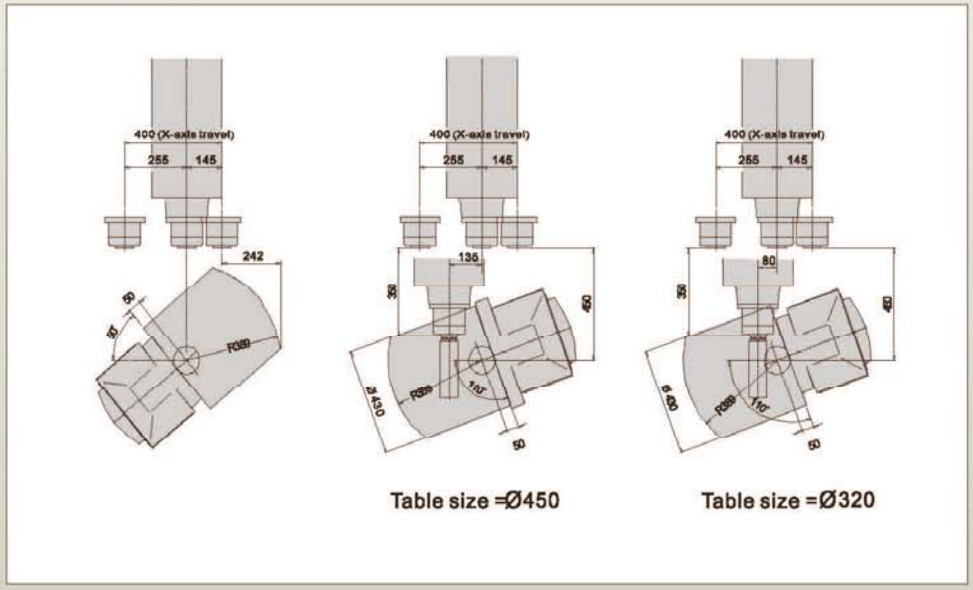


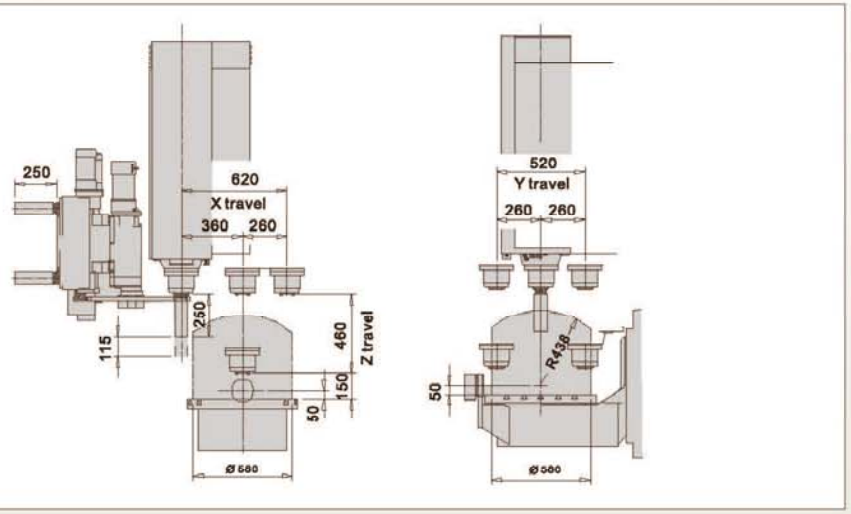
Table size =Ø450

Table size =Ø320

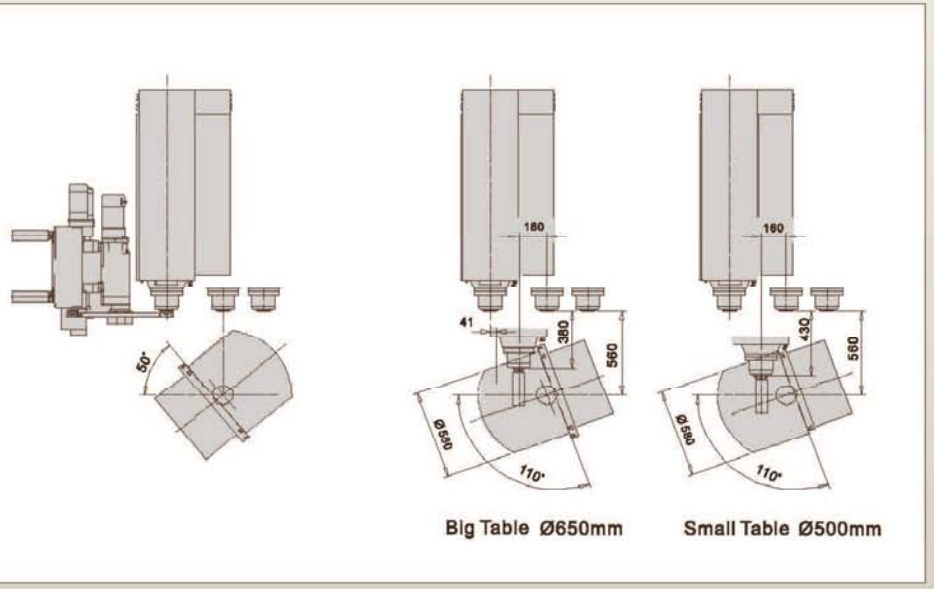
Cutting Area & Interference Area (LU620)

Cutting Area

Unit: mm



Interference Area



Big Table Ø650mm

Small Table Ø500mm

Machine Specification

Model		LU-400	LU-620
Travel			
X/Y/Z Axes Travel	mm	400/350/350	620/520/460
B Axis Tilting Range		-50° ~ +110°	-50° ~ +110°
C Axis Rotating Range		360°	360°
Spindle Nose to Table Surface	mm	150~500	150~610
Spindle			
Spindle Transmission Type		Direct Drive	Direct Drive
Tool Shank		ISO 40	ISO 40
Spindle Speed	rpm	12000	12000
ATC			
Magazine Capacity	T	30	32
Taper		BBT 40	BBT 40
Max. Tool Length	mm	250	250
Max. Tool Diameter (No Adjacent Tool)	mm	Φ75 (Φ127)	Φ75 (Φ127)
Motor			
Spindle Motor (Cont./30mins)	Kw	5.5/7.5(FANUC)	18 / 21(Siemens)
X/Y/Z Axes Motor Power	Kw	4 / 2.7 / 4(FANUC)	7.2 / 5.0 / 7.2(Heidenhain)
B/C Axes Motor	Kw	4 / 1.6(FANUC)	9.6 / 5.0(Heidenhain)
B/C Axes			
Worktable Size (Outer/Inner)	mm	Φ450(OP Φ320)	Φ580(50+R438)L/Φ500
Center Hole Size	mm	Φ55H7X12.5 in depth	Φ50H7X30 in depth
T Slot/Pitch/Size	mm	T14Radial Type 8 Slots	5x100x18
Max. Workpiece Size	mm	Φ430x(50+R389)L	Φ580x(50+R438)L
Max. Worktable Loading	kg	150/200(90°/Horizontal)	200/300(90°/Horizontal)
Rapid Travel			
X/Y/Z	M/min	48/48/48	36/36/36
B/C	rpm	25	25
Cutting Feedrate	mm/min	1-20000	1-20000
Control			
Type		FANUC 0iMF	HEIDENHAIN ITNC 530(5)
Miscellaneous			
Machine Weight	kg	6000	8800
Coolant Tank	L	220	240
Dimension (L*W*H)	mm	1980x2400x2720	2260x2590x2880
Power Requirement	KVA	20	25
Air Source	kg/cm² (ℓ/min)	6(1600)	6(1600)

■ Pictures in this catalog are for reference only.
■ Litz reserves all rights to change the appearance or to suspend the specifications or options of machines.

Optional List

●Standard ○Optional ☆Inquiry Needed —Not Available

	LU-400	LU-620
Spindle		
Direct Drive Spindle 12000RPM	●	●
Direct Drive Spindle 15000RPM	○	○
Spindle Oil Cooler	●	●
Spindle Motor Plate Cooling System	●	●
Coolant Through Spindle (CTS)	○	○
Spindle Air Seal System	●	●
Cooling System		
Spindle Programmable Air Blow	●	●
Spindle Splash Ring	●	●
Coolant Cooling System	○	○
Chip Removal		
Chip Auger	●	—
Chain Type Chip Conveyor	○	●
Chip Cart	●	●
Water Gun	●	●
Air Gun	●	●
Flush Device	○	○
Top Enclosure	○	○
Full Enclosure	●	●
Measurement System		
Laser Tool Length Measurement	○	☆○
Touch Type Tool Length Measurement TT140	○	○
Wireless Workpiece Measurement TS640	○	○
Worktable Unit		
Worktable Tailstock Support	●	●
Air Outlet for Fixture	☆○	☆○
Large Table 650mm	—	●
Large Table 450mm	○	—
Large Table 320mm	●	—
Safety System		
Front Door/Side Door Safety Switch (LU400 is Anti Chip Door)	●	●
CE	○	○

	LU-400	LU-620
Coolant Oil Separator		
Disc Type Coolant Oil Separator	○	●
Machine Coolant Oil Separator	—	●
ATC Unit		
ATC	●	●
Taper BBT40	●	●
Tool Capacity 32T	—	●
Tool Capacity 48T	—	○
Tool Capacity 30T	●	—
3Axes Transmission		
3Axes Roller Type Linear Guideways	●	●
3Axes Linear Scales	○	○
B Axis Linear Scale	●	●
C Axis Linear Scale	●	●
Z Axis Motor System w/ Brake	●	●
Electrical		
Worklight	●	●
Alarm Light	●	●
M30 Auto Shut Off	●	●
Heat Exchanger	●	●
Air Conditioner	○	○
Control		
Fanuc 0iMF (4+1)	●	—
TNC620 (4+1)	○	○
i TNC530 (5 axes simutaneous)	○	●
Transformer	☆○	☆○
Anti Collision Software	—	●
Center Calibration Function	☆○	☆○
Miscellaneous		
Oil Mist Collector	○	○
Rotary Window	○	○