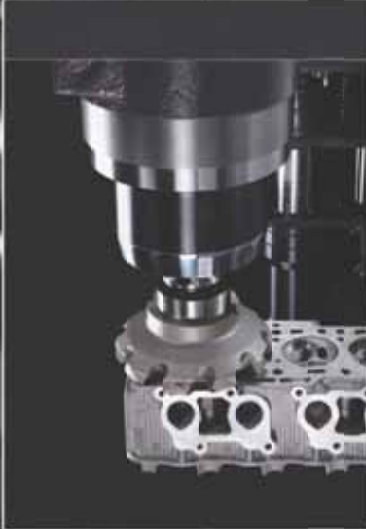




# LH



**LH300/350A**

**HORIZONTAL MACHINING CENTERS**

**RON MACK**  
MACHINERY



**Tim Walker**  
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tim@ronmack.com.au  
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Distributing Agent



# **MITSEIKI**

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## LH300/350A

- Advanced Technology & Design*
- High Rigidity w/ Square T Structural Design*
- High Performance Setup & Maintainability*
- Spindle & 3 Axes Heat Displacement Control*
- High Performance Control System & HMI*
- High Efficiency Chip Removal System*



## **RIGID & COMPACT MACHINE CASTING**

Meehanite casting is used on all major casting components, for its stable material composition & casting quality.

All casting is analyzed by Finite Element Analysis, to ensure structural rigidity.

## **SPECIAL RIB CONSTRUCTION**

Wide base, and robust structure, ensure steady machining against heavy loads.



# SIGNIFICANT REDUCTION OF THE NON-MACHINING TIME

Spindle's acceleration/deceleration time, all axes' rapid movement, and ATC changing time, are all the key elements in reducing the non-machining time and ultimately increase high production efficiency.



Efficiency

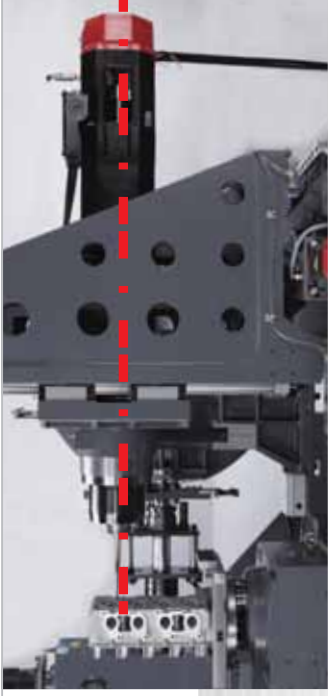


High Speed

15inch Screen (Optional)  
10.4inch Screen (Standard)

## SPINDLE TRANSMISSION SYSTEM

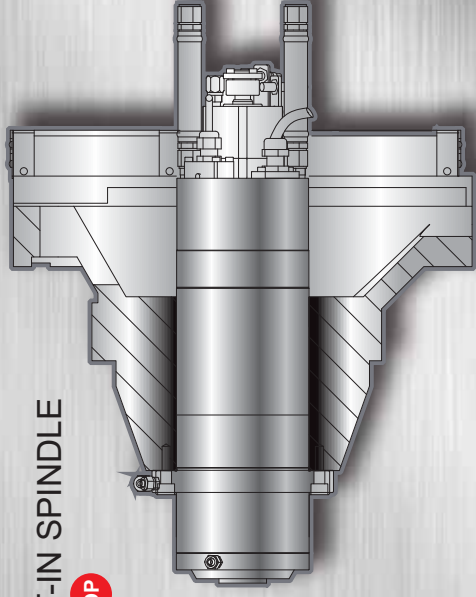
### UNIQUE IDD SPINDLE TRANSMISSION



#### The optimal heat isolation design IDD (Isolated Direct Drive System)

- Lower heat displacement, and higher spindle precision & lifetime.
- Low noise, backlashes, vibration.
- High machining performance.

### HIGH SPEED BUILT-IN SPINDLE MOTOR SYSTEM **OP**



## INCREASE HIGH YIELD RATE

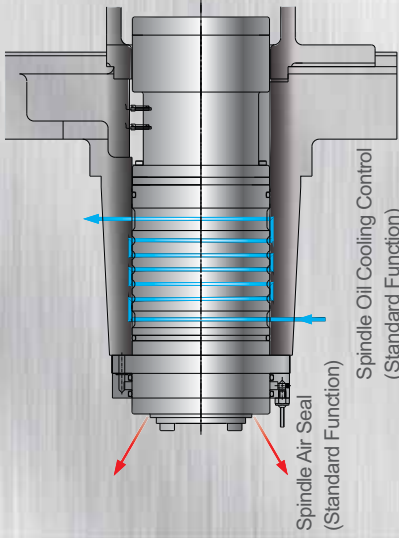
Highly efficient chip removal system increases the production capability.

## Chip Removal

## SPINDLE MOTOR SYSTEM



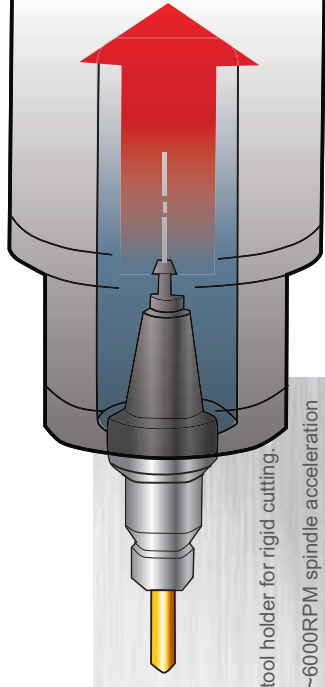
High performance spindle motor w/ high torque output during low RPM characteristics.



## SPINDLE AIR CURTAIN SYSTEM

High speed spindle with spindle oil cooling system keeps a stable temperature range in the spindle, which ensures a high speed/precision spindle. The spindle air curtain system prevents dusts getting into the spindle.

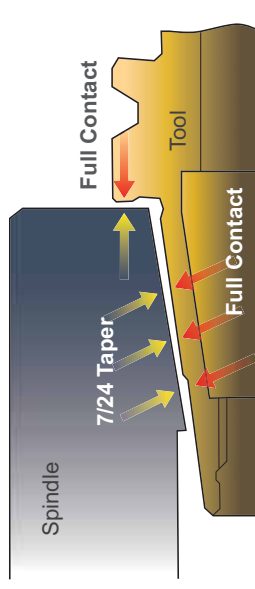
## RAPID REACTION & HIGH PULL FORCE SPINDLE



- ▶ Spindle Tool Pull Force  
**250kgf** (LH-300)  
**1000kgf** (LH-350A)
- ▶ High pull force spindle on the tool holder for rigid cutting.
- ▶ **0.6** second is needed for 0~6000RPM spindle acceleration
- ▶ **1.2** second is needed for 6000~0RPM spindle deceleration

## TWO-FACE CONSTRAINT BBT TOOL HOLDER

7/24 taper is used



- ▶ Full contact at the taper and spindle face makes the spindle vibration-less during machining.



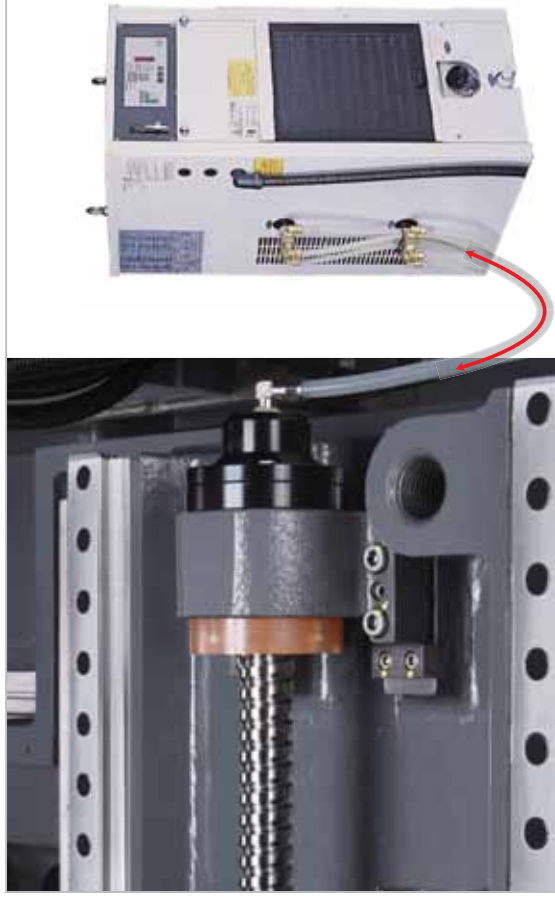
## 3 Axes Transmission System



### 3 Axes Ball-Type Ballscrews System

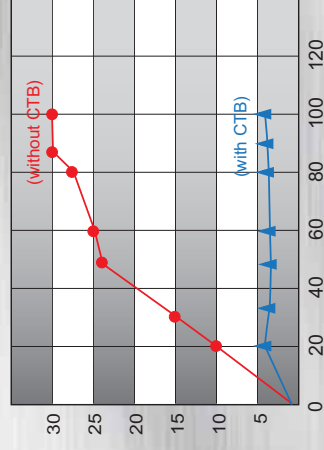
- Large diameter ball-type ballscrews are used for transmission rigidity, to ensure positioning and repeatability.
- XY/Z rapid speed **48m/min** (LH-300/LH-350A)
- Telescopic cover: XY axes are fin-type, and Z axis is 2 pieces for reduced vibration and noise.

## 3 Axes Coolant Through Ballscrew (CTB)



### Hollow Ballscrew Efficiency Chart

Hollow coolant design is used for the 3 axes ballscrews. Coolant oil are constantly recycling through the ballscrews to reduce the heat.



### Testing Conditions

Ballscrew Diameter (mm)	Revolution (RPM)	Oil Temperature (°C)	Ball Diameter (mm)
Ø32xP12	1000	20	6.35

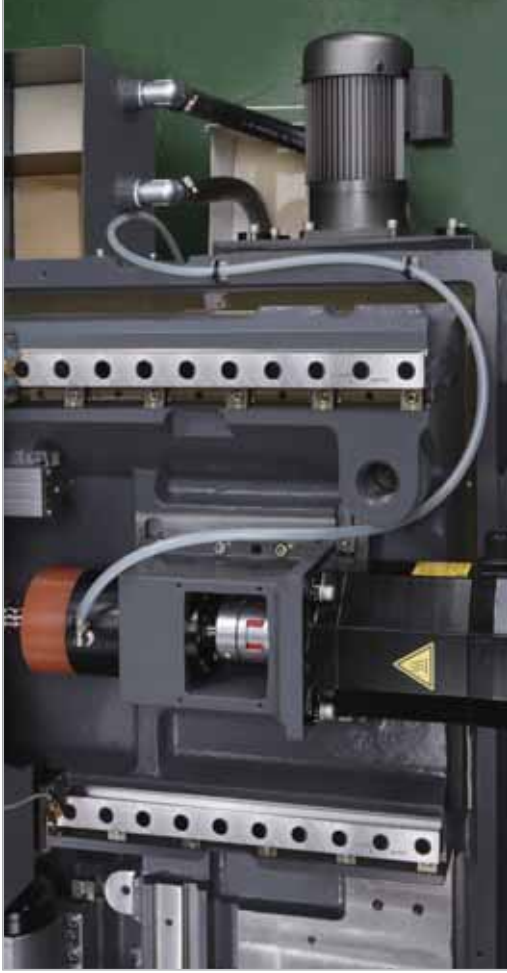
### High Speed, High Precision Linear Guideways

- Zero backlashes for the linear guideways. Great cutting surface for the contour cutting and etc.
- Suitable for high speed operation, to reduce the power required.

**Cylinder Type Linear Guideway** Linear guideway has low friction during movement, which increases the lifespan of the guideway.



## Disc Oil Separation Unit



- Disc oil-coolant separator is used, to avoid deteriorating cutting coolant, which may affect the machining quality.

- After separation, the coolant is recycled to the coolant tank for re-use. Lubricant are recycled for further treatment.



### 3 Axes Direct Drive Transmission

- 3 Axes motor and high precision/speed ballscrew direct transmission.
- Pre-tensioned ballscrews for high ballscrew rigidity and lower heat displacement
- axes hollow coolant system, to significantly lower the heat displacement during machining.
- C3 grade ballscrews are used.



### Collision proof

- Collision proof equipment are employed to reduce the impact.

## APC Pallet System

### Rotary 2 Sided Type APC

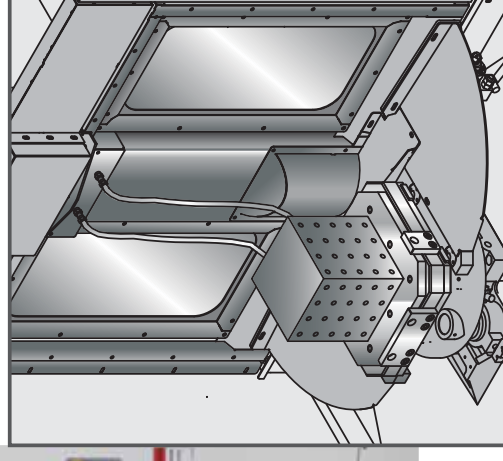
APC is high speed, with high repeatability

- ▶ Minimum pallet indexing **0.001°** degree (standard)
- ▶ The pre-loading pallet can be rotated randomly **0° 90°** degrees.



Pallet (Work Table)

### Hydraulic Source for APC **OP**

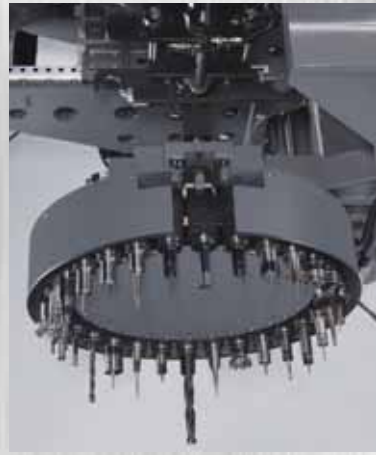




## Automatic Tool Changing (ATC) & Magazine



- ▶ Rapid, simple, reliable, and long lifespan tool changing unit, for most reliable tool changing operation.
- ▶ Unique tool changing design w/ cam type transmission mechanism is used. Tools are selected by random tool selection method with PLC control software.
- ▶ ATC is tested up to million operating test.



## Chip Removal System


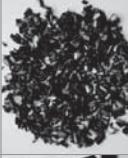


### Chain Type Chip Conveyor and Chip Cart

Chip auger is equipped on both sides of the worktable. Chip conveyor and chip cart are also equipped at the rear of the machine for chip removal solutions.



### Chip Conveyor Selection

: Excellent    x : Average    x : Poor

Material	Steel	Cast Iron	Alum.	Mixed Chips
Chip Shape				
Conveyor		(Dry Cutting)		
Track Type Conveyor	Screw Type			
	Scrape Type	x		
Chain Type Conveyor	Alum. (Light)	x		
	Chain Type		x	

## Wash Down System

### Disc Type Oil-Coolant Separator & Coolant Device

Oil-coolant separator can be easily installed with small floor occupancy. Higher cutting quality can be achieved from stable coolant quality provided by constant separation of oil and coolant.



### Wash Down System

Wash down system can be equipped to avoid accumulation of the chips inside the machine.



### Coolant Gun

Coolant gun is equipped for cleaning the chips in the working area.



## Compact Floor Space



### Front Door Visibility



### Operating Door Visibility



Large safety poly carbonate glass is used for the front door and operating door windows.

## Maintainability

All important component, wires, tubes are centralized for easy daily maintenance.

### Hydraulic Tubes Centralization

- ▶ Hydraulic unit and oil-coolant unit are both installed on the machine, for easy daily check.



### Centralization of the Tubes at Rear of Main Motor

- ▶ All main motor's related tubes/wires are centralized.
- ▶ Ease of maintenance after maintenance door is opened.
- ▶ All tubes are labeled.



### ATC Door

- ▶ Ease of inspection, loading/unloading through ATC door.
- ▶ Safety device is equipped for the ATC door. ATC operation is halted once door is opened.
- ▶ Wide ATC window for inspection of the ATC operation.



## Safety System

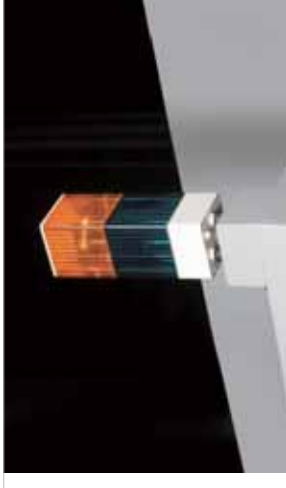
### Safety Door

- ▶ When safety door is not closed, cutting program will not be allowed to initialize.
- ▶ When door is opened during operation, all movement will be stopped for safety.



### Alarm Light

- ▶ Yellow flashing light signals the completion of the cutting program.
- ▶ Red flashing light signals that trouble shooting is required.



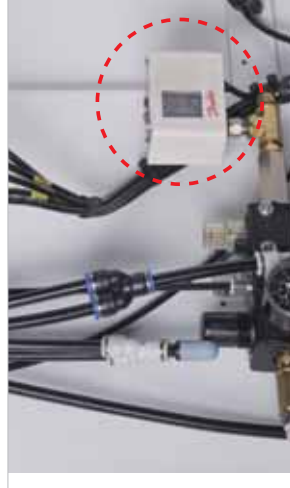
### Buzzer OP

- ▶ When machine is abnormal, alarm message will be generated, and buzzer will beep to alert the operator for further trouble shooting.



### Low Pneumatic Pressure Alarm

- ▶ Pneumatic system with alarm to alert low pneumatic pressure.







High Precision

## High Performance Equipment



### Linear Scales **OP**

- XYZ axes can be equipped with linear scales.
- Air purge is equipped to protect the linear scale, to avoid dust or oil mist contamination. This helps the precision and lifespan of the linear scales.

### Coolant Through Spindle (CTS) Unit **OP**



- CTS is available for option. CTS allows high pressure coolant to travel through the spindle and tool, to imminently take away the heat.



### Spindle Splash Ring

- 4 nozzles are equipped for the spindle splash ring system. The 4 nozzles are equipped around the spindle to lower the cutting temperature, and increase the machining quality.



## Measurement System



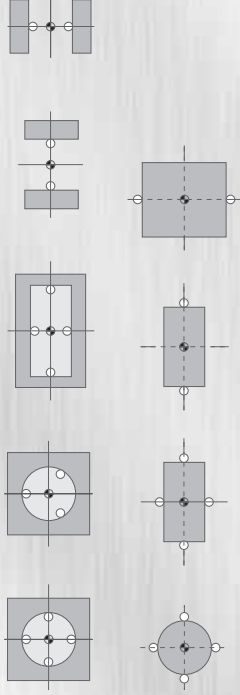
### Workpiece Measurement System **OP**

- Renishaw RMP60
- Automatic center measurement
- Automatic measurement system and its application, please see below diagrams.

#### Automatic Measurement Application

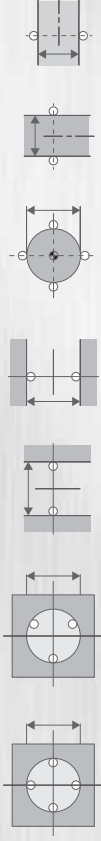
##### Centering Setup

Automatic setup of the workpiece 0 position.



##### Measurement

Measuring the workpiece size.



### Tool Length Measurement **OP**

- Renishaw NC4S
- Automatic tool measurement.
- Automatic measurement's application as shown on the right.

#### Automatic Measurement Application



- **Tool Measurement**  
Automatic tool length measurement

## Reduced Power Consumption / Oil Demister



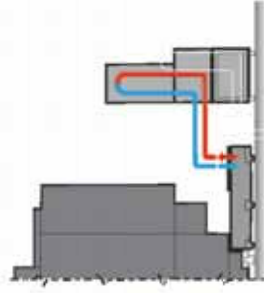
- Auto Shut Off for the Machine Lamp**  
 If controller is not operated for a certain amount of time, the lamp inside the working area will be shut off, to reduce the power consumption.
- Power Shut Off Function**  
 If the machine is idled for a certain amount of time, spindle motor/servo motor/coolant pump will be shut off to reduce power consumption.

- Lubrication System Auto Shut Off Function**  
 If the 3 axes is not operated in a certain amount of time, the lubrication system will be shut off to reduce the lubrication oil usage.
- Screen Auto Shut Off Function**  
 Screen will be shut off, if controller is not used for a certain amount of time.



### Oil Demister

- Fully sealed enclosure and oil collection to efficiently recycle the dust and oil mist. Oil demister can avoid the poisonous mist and material to be inhaled by the operator.
- Air quality can be maintained in a clean factory environment.



### Cutting Coolant System

- Coolant system can limit the heat generated from machining, and further ensure the precision.

## Human Machine Interface (HMI) / Operability



※15inch Screen (Optional)  
10.4inch Screen (Standard)



※15inch Screen (Optional)  
10.4inch Screen (Standard)

### Next Generation Interactive Operating System

- When safety door is not closed, cutting program cannot be initialized, to ensure operator's safety.
- Cutting program will be interrupted if the door is opened during the operation.

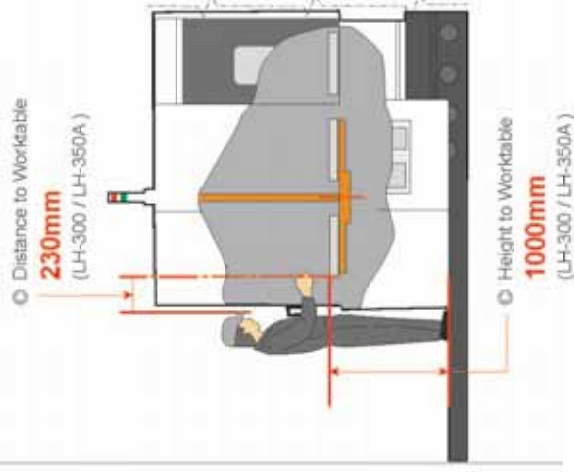
### Reachability

- Distance to Worktable  
**230mm**  
 (LH-300 / LH-350A)



Ultra Large Door Width Design, for Ease of Loading/Unloading

- Reduced distance for operator & worktable. Door opening width **700mm** (LH-300 / LH-350A)



- Height to Worktable  
**1000mm**  
 (LH-300 / LH-350A)

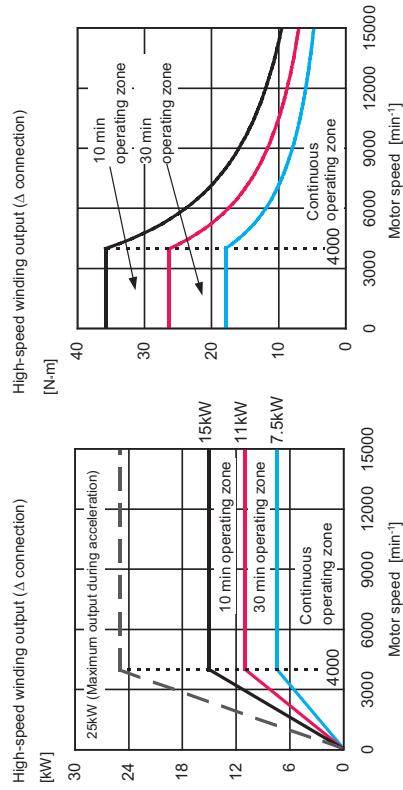
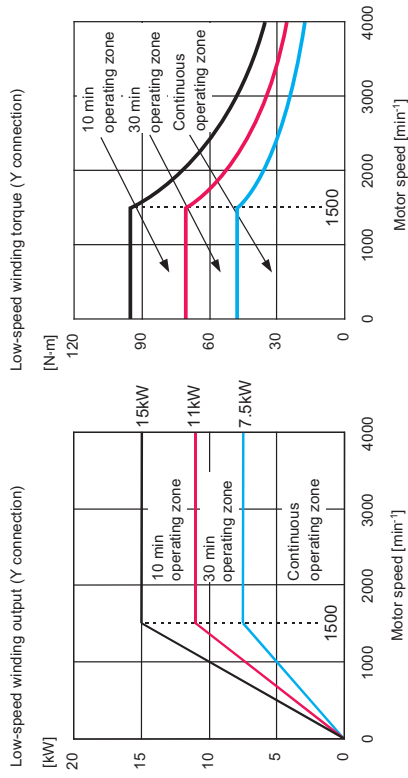


# Spindle Motor Power and Torque Chart

Applicable amplifier SPM-26i

**αiIT 8/15000**

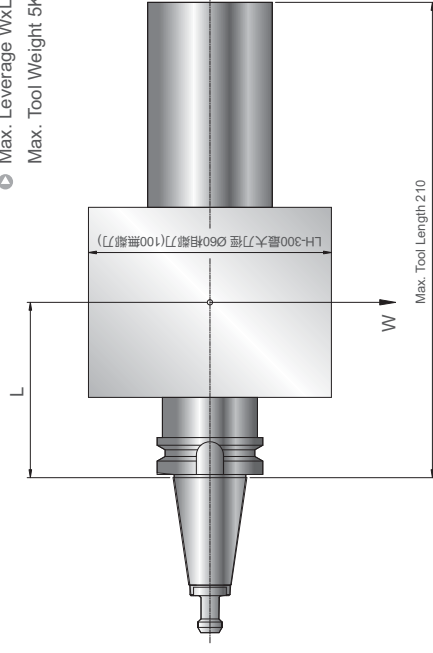
**LH-300/LH-350A**



# Tool Specification

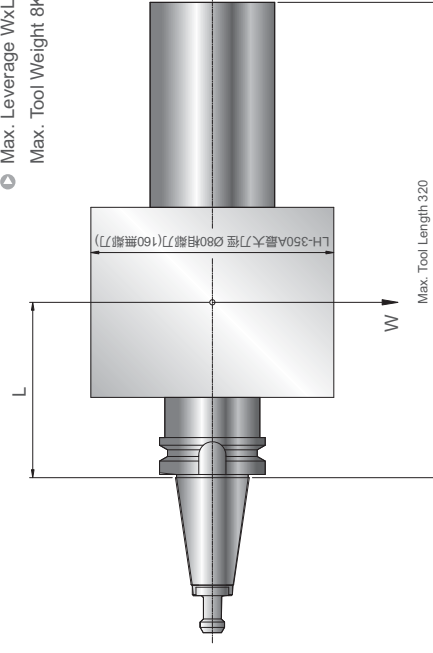
**BBT-30 (LH-300)**

- Max. Leverage WxL 300Kg<sub>f</sub>-Cm
- Max. Tool Weight 5Kg<sub>f</sub>(LH-300)



**BBT-40 (LH-350A)**

- Max. Leverage WxL 300Kg<sub>f</sub>-Cm
- Max. Tool Weight 8Kg<sub>f</sub>(LH-350A)



## Test Cut Information

800-34

Face Milling



End Milling



**LH-300**

Ø50mm

- ▶ Material Removal **75mL/min**
- ▶ Spindle Speed **1500 rpm**
- ▶ Feedrate **1000 mm/min**

Ø14mm

- ▶ Material Removal **98mL/min**
- ▶ Spindle Speed **1500 rpm**
- ▶ Feedrate **1000 mm/min**

**LH-350A**

Ø80mm

- ▶ Material Removal **168mL/min**
- ▶ Spindle Speed **1450 rpm**
- ▶ Feedrate **1200 mm/min**

Ø16mm

- ▶ Material Removal **128mL/min**
- ▶ Spindle Speed **1500 rpm**
- ▶ Feedrate **1000 mm/min**

## Test Cut Information

800-35

Drilling



Tapping



**LH-300**

Ø20mm

- ▶ Spindle Speed **1200 rpm**
- ▶ Feedrate **500 mm/min**

▶ Tool Specification

- ▶ **M16xP2.0**
- ▶ Spindle Speed **228 rpm**
- ▶ Feedrate **456 mm/min**

**LH-350A**

Ø35mm

- ▶ Spindle Speed **230 rpm**
- ▶ Feedrate **35 mm/min**

▶ Tool Specification

- ▶ **M24xP3.0**
- ▶ Spindle Speed **100 rpm**
- ▶ Feedrate **300 mm/min**

## High Precision

### Laser Inspection

- Full travel dynamic precision through laser compensation calibration



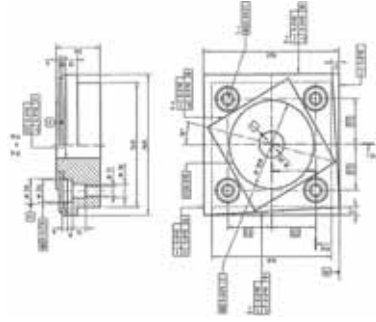
### Ballbar Inspection

- Ballbar test to ensure the roundness and geometrical precision.



## Standard Specimen

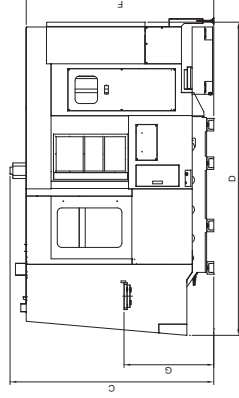
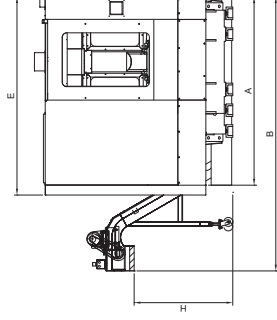
- Every machine is inspected carefully before shipment. International standard dynamic cutting specimen is also required to pass the inspection.
- The specimen is tested through CMM to ensure the result of the actual cutting standard.



## Machine Exterior Dimension

### Dimension

Unit : mm

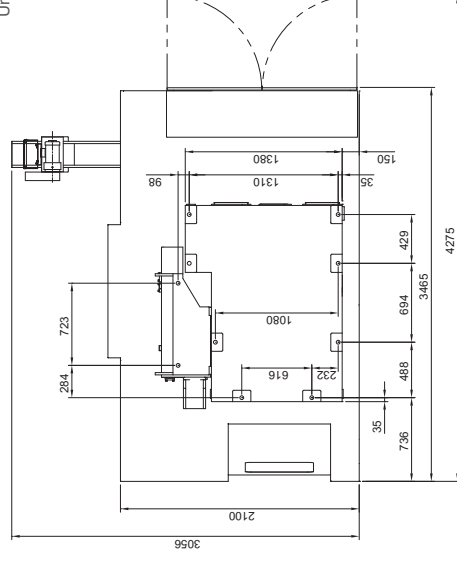


Dimension Model	A	B	C	D	E	F	G	H
LH-300	2100	3056	2270	3465	2210	2090	1000	1100
LH-350A	2100	3056	2270	3465	2235	2090	1000	1100

## Floor Space & Foundation

LH-300 / LH-350A

Unit : mm

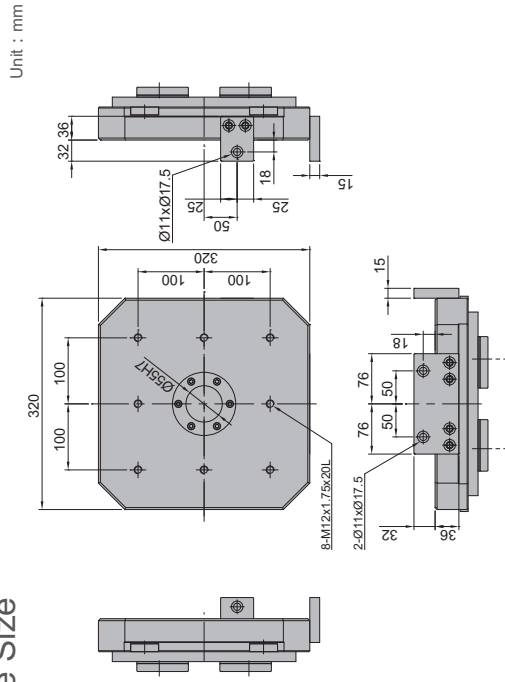




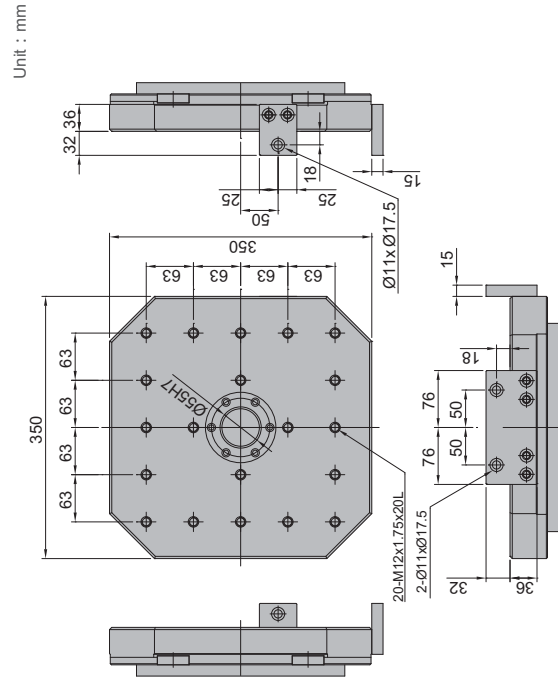
# Machine Dimension

## Worktable Size

LH-300

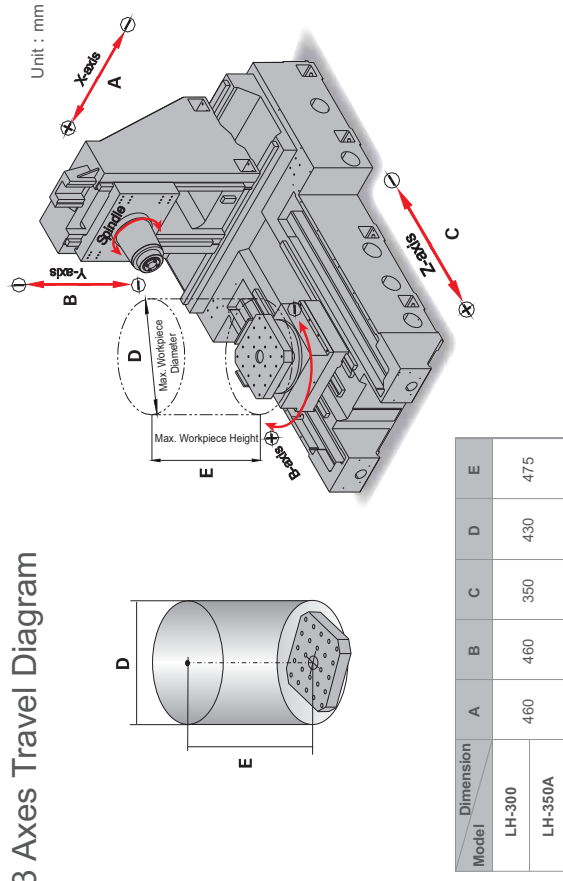


LH-350A

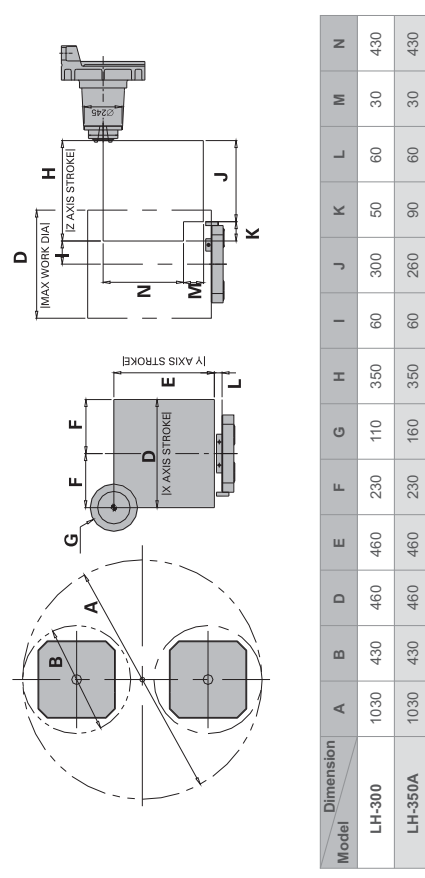


# Machine Dimension

## 3 Axes Travel Diagram



## Cutting Range



# Technical Specification

Description	LH-300	LH-350A
Travel		
XYZ Axis Travel	460/460/350	460/460/350
Spindle Center to Worktable Surface	60-520	60-520
Spindle Nose to Worktable Center	60-410	60-410
Worktable		
Worktable Size	320x320	350x350
Max. Workpiece Size	Ø430	Ø430
Max. Table Loading	250	250
Max. Workpiece Height	475	475
Worktable Setup	8-M12 Pitch 100	20-M12
Min. Worktable Indexing	0.001°	0.001°
Spindle		
Max. Spindle Speed	15000	12000
Max. Spindle Cutting Torque	70	70
Spindle Taper	7/24Taper,No.30	7/24Taper,No.40
Spindle Bearing Diameter	45	70
Spindle Transmission	Direct Drive	Direct Drive
Feedrate		
3 Axes Rapid Speed	48000	48000
Cutting Feedrate	1-12000	1-12000
Manual Feedrate	1260	1260
Auto Tool Changing Unit		
Tool Taper	BBT-30	BBT-40
Tool Capacity	30	30
Max. Tool Diameter (No Adjacent Tool)	60(100)	80(160)
Max. Tool Length	210	320
Max. Tool Weight	5	8
Tool Selection	Random	Random

# Technical Specification

Description	LH-300	LH-350A
Auto Pallet Changer		
Number of Pallets	2	2
Pallet Changing Type	Swing Type	Swing Type
Tool Changing Time	10	10
Control		
Fanuc	0i-MD	0i-MD
Motor		
Spindle Motor Power	7.5 / 11	7.5 / 11
Spindle Motor Torque	70	70
XY/Z/B Axes Motor Power	2.7 / 4.5 / 2.7 / 1.6	2.7 / 4.5 / 2.7 / 1.6
Hydraulic Motor	1.5	1.5
Cutting Fluid Motor	1.5	1.5
Power		
Power Consumption	KVA 25	25
Oil/Coolant Tank		
Hydraulic System Capacity	L 50	50
Lubrication System Capacity	L 2	2
Cutting Fluid System Capacity	L 350	350
Machine Dimension		
Machine Height	mm 2270	2270
Floor Space	mm 3540x2710	3540x3060
Machine Weight	kg 6000	6300

- The catalog is only for reference purpose. Actual machine may differ to this specification.
- Litz company reserves the rights to modify, or to stop adopting the specification of this catalog.



## Option List

	LH-300	LH-350A	LH-300	LH-350A
<b>Spindle</b>				
Spindle Speed 12000RPM	○	●	●	●
Spindle Speed 15000RPM	●	○	○	○
Spindle Oil Cooler	●	●		
Air Curtain System	●	●		
Direct Drive Spindle	●	●		
<b>3-Axis Transmission</b>				
3-Axes Roller Linear Guide	●	●		
3-Axes Hollow Cooling	●	●		
3-Axes Linear Scales	○	○		
4th Axis Scale	○	○		
<b>Pallet</b>				
Worktable 1Degree Indexing	△	△		
Worktable 0.001 Indexing	●	●		
M12 Position Holes	●	●		
Worktable T Slot	○	○		
<b>Coolant System</b>				
Splash Ring	●	●		
Spindle Air Blow	○	○		
Center Through Spindle	○	○		
<b>Chip Removal</b>				
Cham Type Chip Removal System	●	●		
Chip Cart	●	●		
Chip Auger	●	●		
Machine Oil-coolant Separator	●	●		
Wash Down	●	●		
Disc Type Oil-coolant Separator	●	●		
<b>Safety System</b>				
Front/Side Door Safety Switch			●	●
CE Compliance			○	○
<b>Measurement System</b>				
Tool Length Measurement NC-45			○	○
Workpiece Measurement FMP-40			○	○
Tool Breakage Detection (Magazine)			△/○	△/○
<b>ATC &amp; Magazine</b>				
Tool Capacity 30T			●	●
Tool Holder Taper BBT			●	●
Tool Holder Taper CAT			○	○
Spindle Taper #30			●	—
Spindle Taper #40			—	●
<b>Electrical</b>				
M30 Auto Power Off			●	●
Work Light			●	●
Alarm Light			●	●
Air Conditioner for Cabinet			○	○
Heat Exchanger for Cabinet			●	●
<b>Control</b>				
Fanuc 31i			○	○
Fanuc 0iMD			●	●
Mitsubishi M720			○	○
<b>Miscellaneous</b>				
Oil Demister			○	○
Rotary Window			○	○

● : Standard ○ : Optional △ : Inquiry Required — : Not Available

## Production Plant



## SALES & DISTRIBUTION NETWORK

