



**The Ultimate in Performance**

## ***BC Series***

**BC-600/BC-700/BC-800/BC-960  
BC-600T/BC-700T/BC-800T/BC-960T  
5 Axes Machining Center  
5 Axes Machining Center With Turning**

**LEADWELL**  
LEADWELL CNC MACHINES MFG., CORP.

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\* All performance are based on 220V/3PH/60HZ. Specifications are subject to change without notice.

2016.06



# 5 AXES HEAD-TABLE MACHINING CENTER

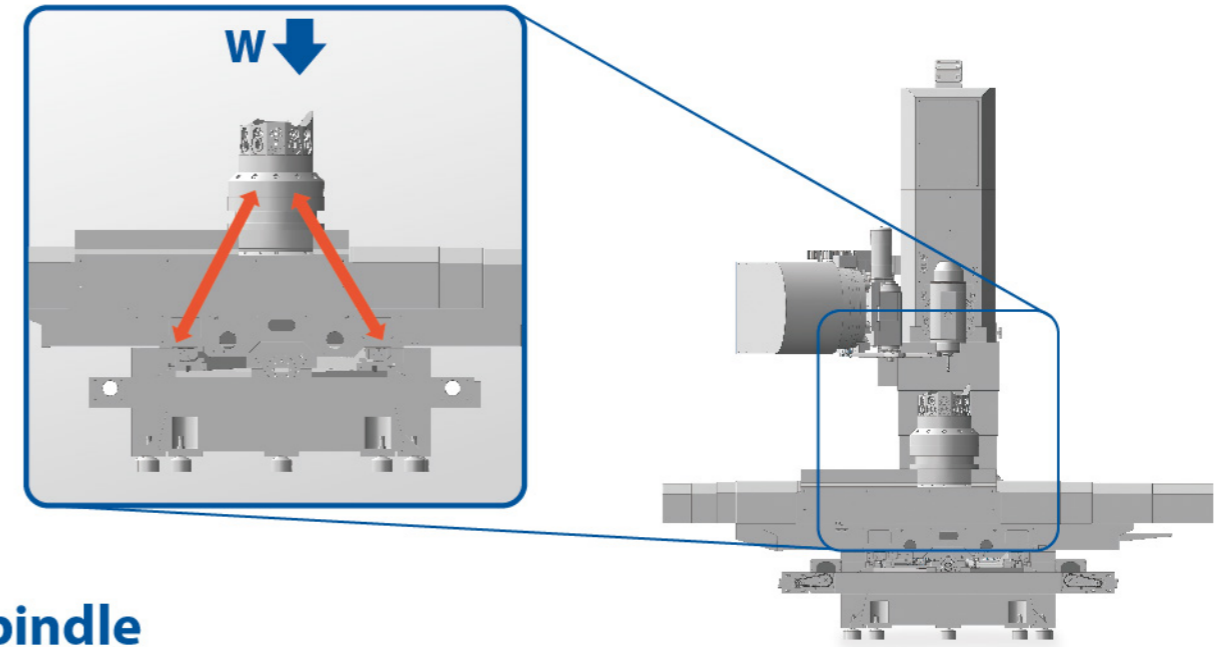
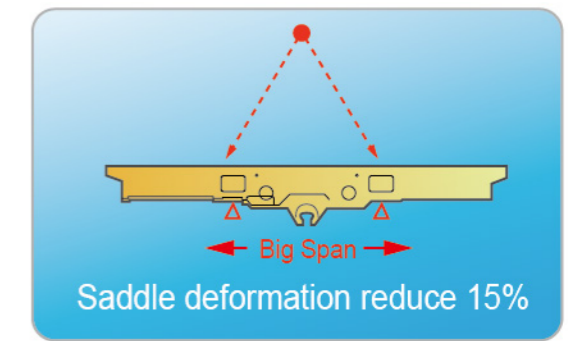
BC series offers 5-axis control capability and flexible machining. The design with low backlash swivel head and removable rotary table not only increase the machining areas but also could be applied in aerospace, automotive and job shop industries.



# STRUCTURE

## Optimum Structural Design

- Greater distance between two linear guides. This is effectively reduce the potential distortion due to the table weights, and it also has better weight distribution onto the saddle.
- The optimum accuracy is achieved as the distortion is minimized.



## Spindle

### Standard 15000rpm Build-in Spindle

- The high rpm spindle is the mainstream of the market, with low vibration and high removal rates. It's most suitable to be used when doing high speed 5 axes machining.
- Optimum design: 15% shorter than the standard spindle, to provide greater space for the workpiece.
- The internal maze design is effective in preventing the coolant and the oil mist to enter the center of the spindle.
- Standard BT-40 with coolant through spindle.

## 1. High Rigidity

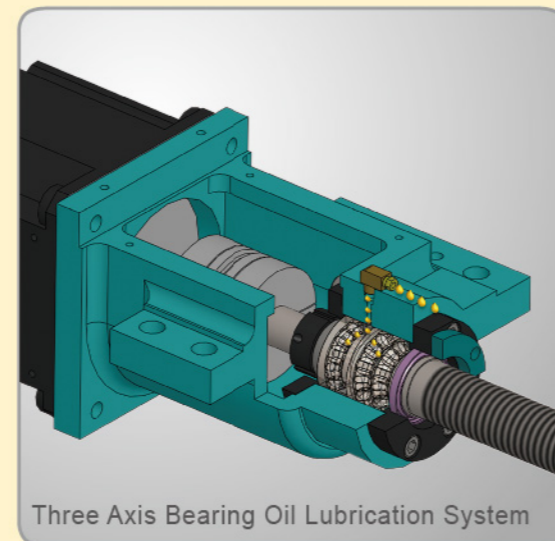
- FEA Analysis
- Rigid structure design
- Dual nuts ball screw design in X and Y axis
- Rotary Table use DD motor
- Roller type guide way(X,Y,Z axis)
- Embedded rotary table design

## 2. High Reliability

- Roller type motion system
- Ball screw bearing lubrication system design
- Dual chip auger
- Three axis optical scale
- Rotary table compensation adjustment system
- Dynamic collision monitoring system
- Moveable ATC design

## 3. High Efficiency

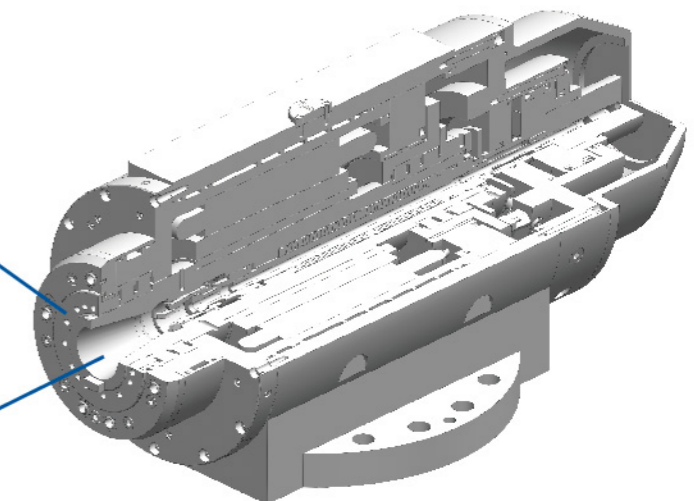
- Rapid feed rate 36/36/30 mm
- Spindle speed 15,000rpm
- 5 axis machining simultaneously



All three axis, and the bearing all have the automatic lubrication system installed. The life of the parts will be prolonged with this system. Not only get better rigidity, also reduce the thermal elongation.

OPT Air Blow by M Code  
20bar CTS

OPT Tool  
availability:  
HSK \ DIN \ CAT

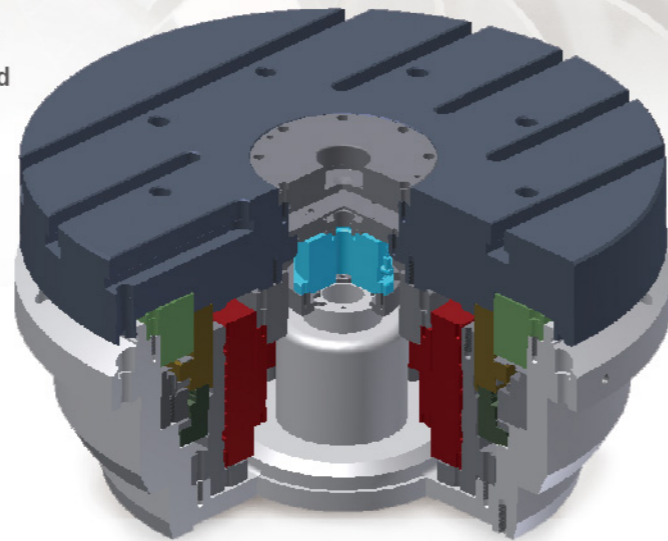
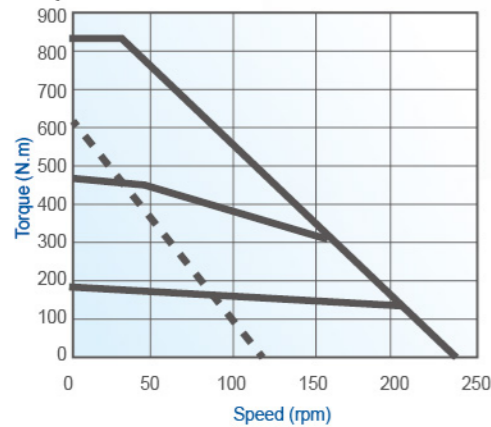




## ROTARY TABLE

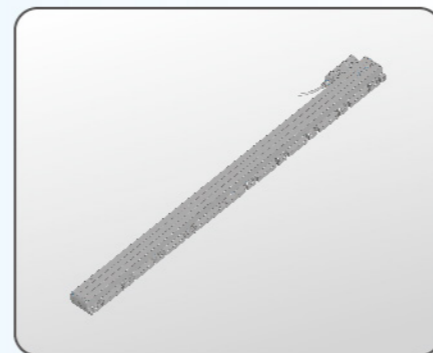
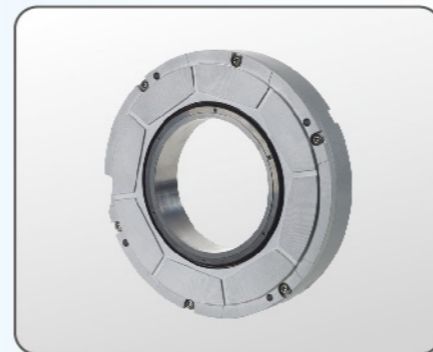
### High Speed and Torque Rotary Table

- The table size:  $\phi 600\text{mm}$  , Maximum speed: 120rpm
- It uses the ETEL series DD motor. It has high speed with high torque at the start. The loading capability is 400kg, without retardation.
- The internal coolant water tunnel is effective in suppressing the thermal expansion of the table.
- Disk-type hydraulic brake.
- The minimum indexing is  $0.001^\circ$
- With Standard Heidenhain RCN series coder.
- C axis table using the DD motor provides (OPTIONAL: Turning Speed 800rpm/min) high torque and rigidity, and solve the traditional worm gear backlash and worn problems.

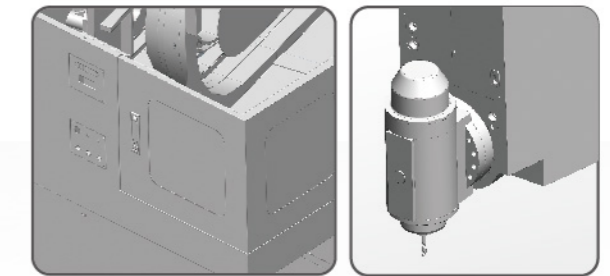
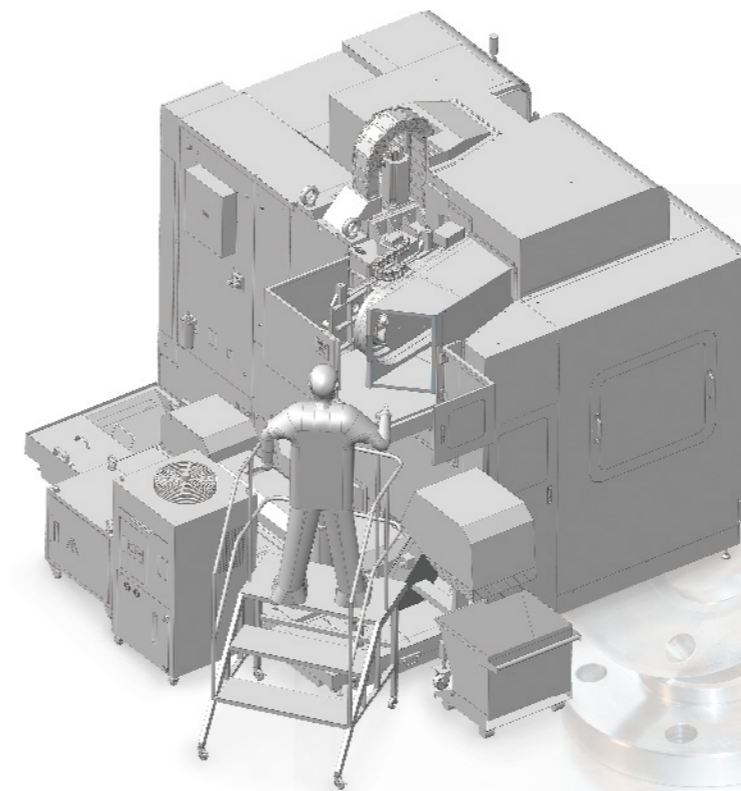


### 5-Axis Linear Scale

- X、Y、Z axis is incorporating with Heidenhain LC series linear scale, accuracy level  $\pm 5\mu\text{m}$ .
- There are no other mechanical parts in between. The linear scale position control ring contains all the motion controllers. The mechanical movement errors can be examined by the linear scale, and to eliminate the hidden error sources.
- The B and C axis is incorporating with Heidenhain RCN series angle encoder to reach the maximum accuracy of  $2''$ . RCN series' angle encoder has high static accuracy, and it is suitable for the rotary table and for swivel spindle to machine high accuracy workpieces.
- The measurement base are the DIADUR reticle's incremental graduated discs. The stator coupling encoder's accuracy has already included the errors occurs from the coupling.



## MULTI-METHODS TOOL LOADING SELECTION

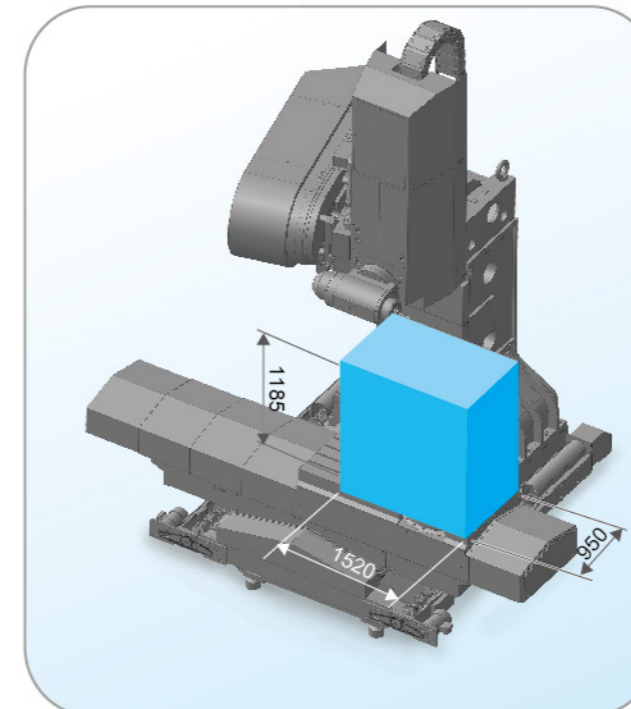


- The operator can choose to load the tool from either the spindle or from the tool magazine directly.
- The tool magazine has the clear label on each slot with the tool selection button to ensure the easy tool loading for the operator.

### Work Area

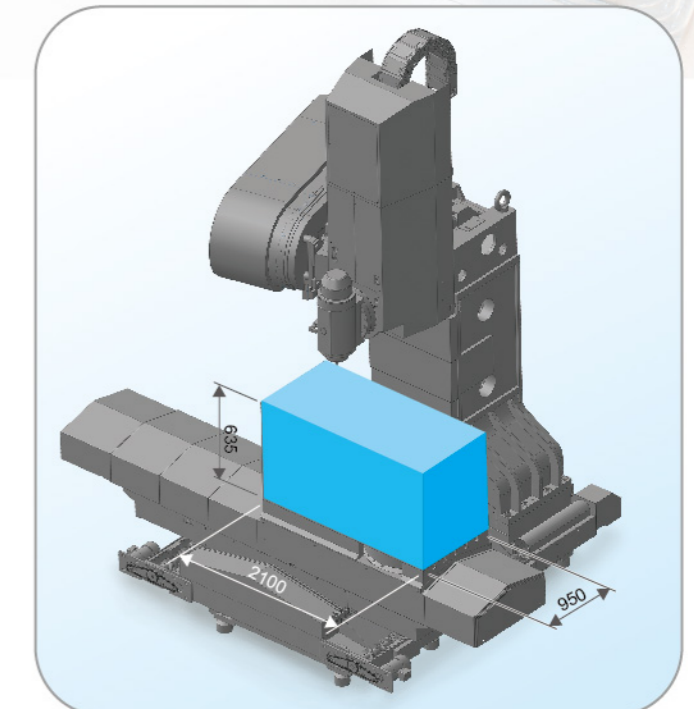
#### 90° Mode

- When the spindle is turned at the  $90^\circ$ , the maximum working range can reach 1520X950X1185mm



#### 0° Mode

- When the spindle is turned at the  $0^\circ$ , the maximum working range can reach 2100X950X635mm

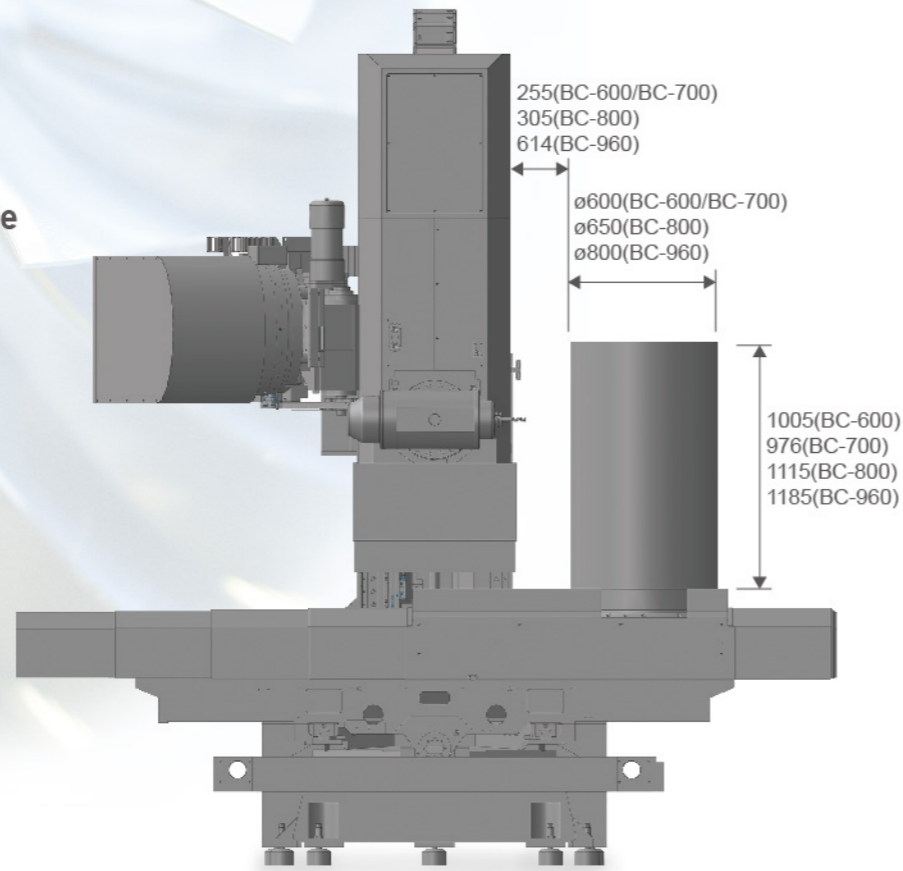
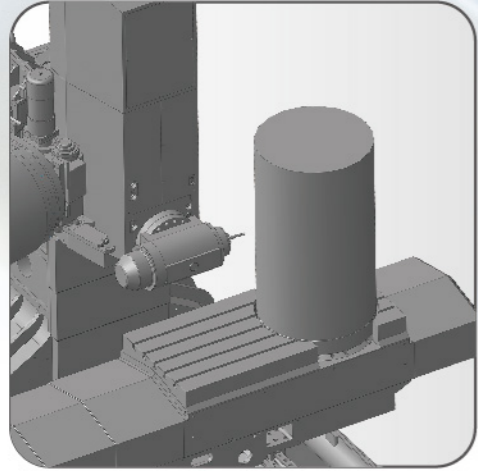




## EMBEDDED TABLE

### The Side Located Embedded Table

- Placing the rotary table on the side can maximize the travel of the X-axis. With  $\phi$  600/650/800 table, it allows the maximum tool length of 255/305/614mm with side boring can pass the spinning center.



### Large Workpiece Friendly

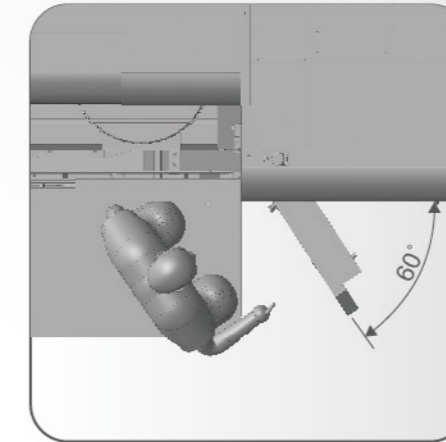
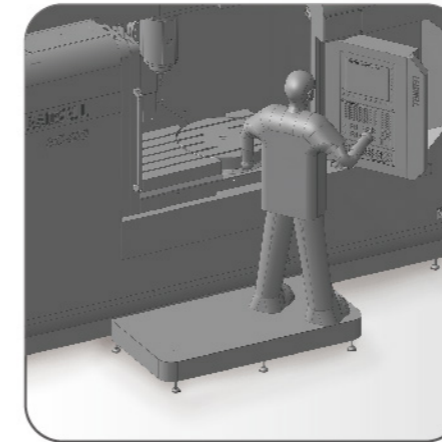
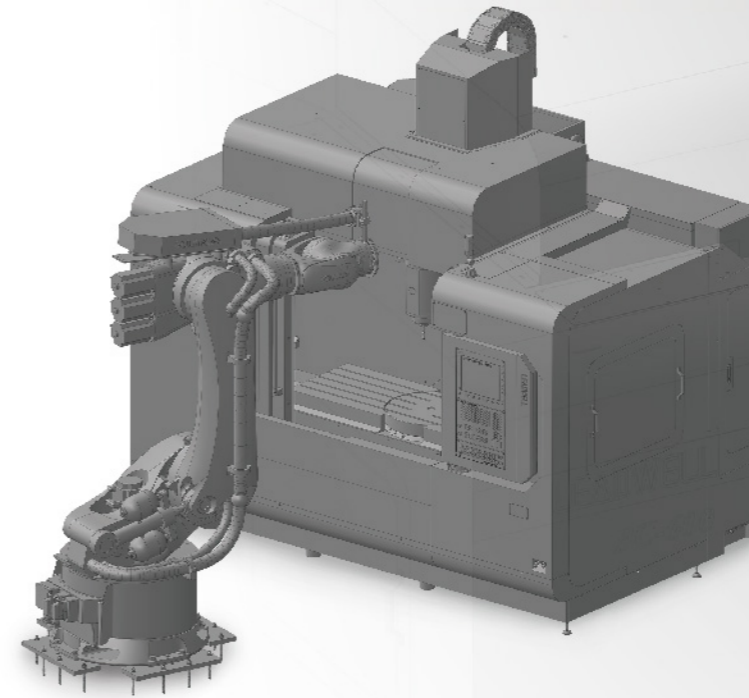
The top front cover can be opened to ensure the efficiency and the safety of operators. The ability to open up the top cover will remove the limitation on machining large workpieces. The opening width can go up to 460mm.

- The sliding door has no door trace, the opening width can go up to 2100 mm. The large opening space ensures the easiness when loading/uploading the workpiece.
- The front stainless steel cover is scratch resistant and highly durable towards the day-to-day work wear. The use of stainless steel cover are also prettier than other materials.

## AUTOMATIC APPLICATION

### Robotic Arm

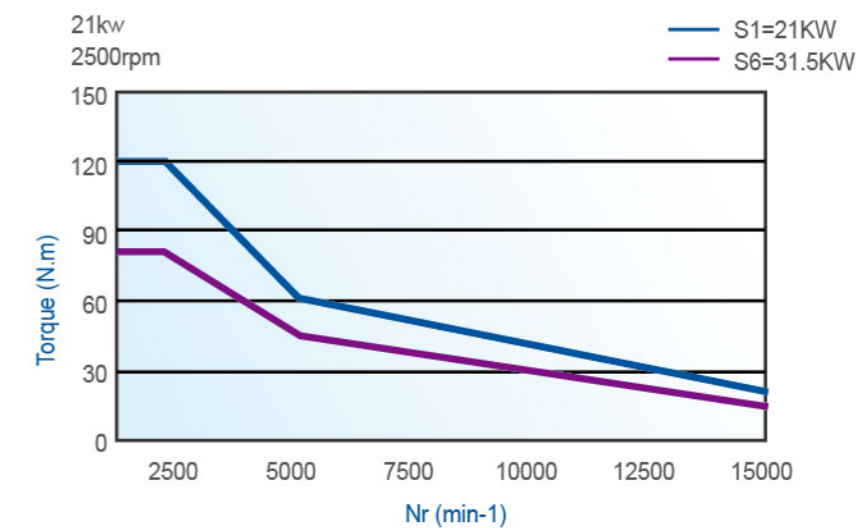
- The automatic application is incorporated with the KUKA KR series robotic arm. The front auto door can now load/unload the workpieces with the arm to increase the productivity.



### Swivel Panel Ergonomic Design

The controller has a 10.4" screen built-in, and it can swing for maximum 60° to provide easiness for the operator for tool adjustment and all operation controls.

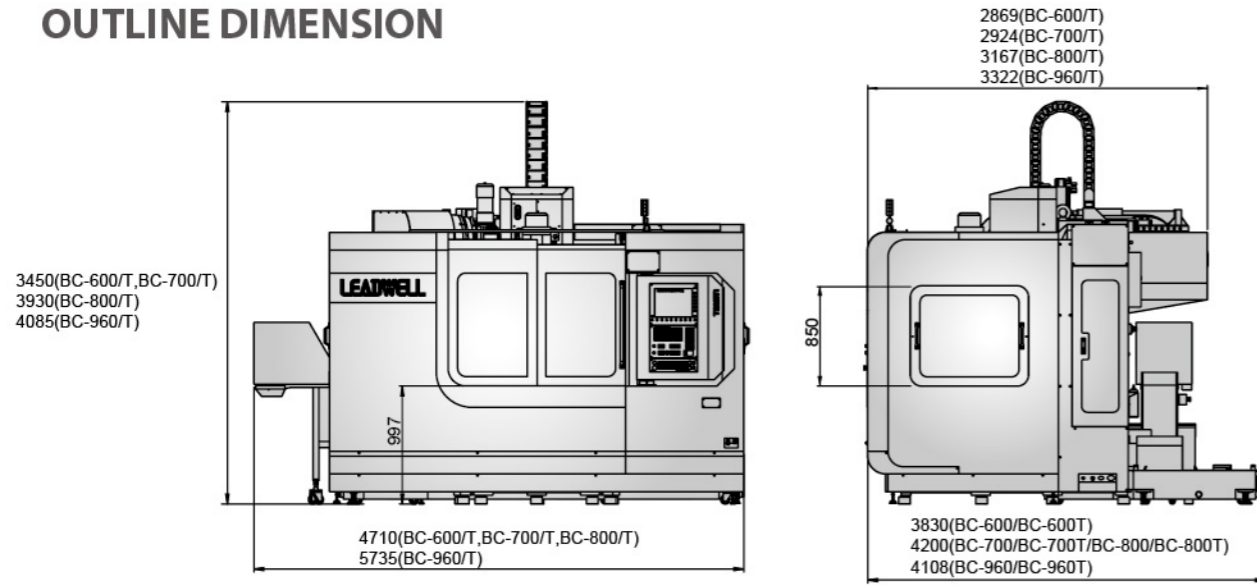
## SPINDLE POWER CURVE



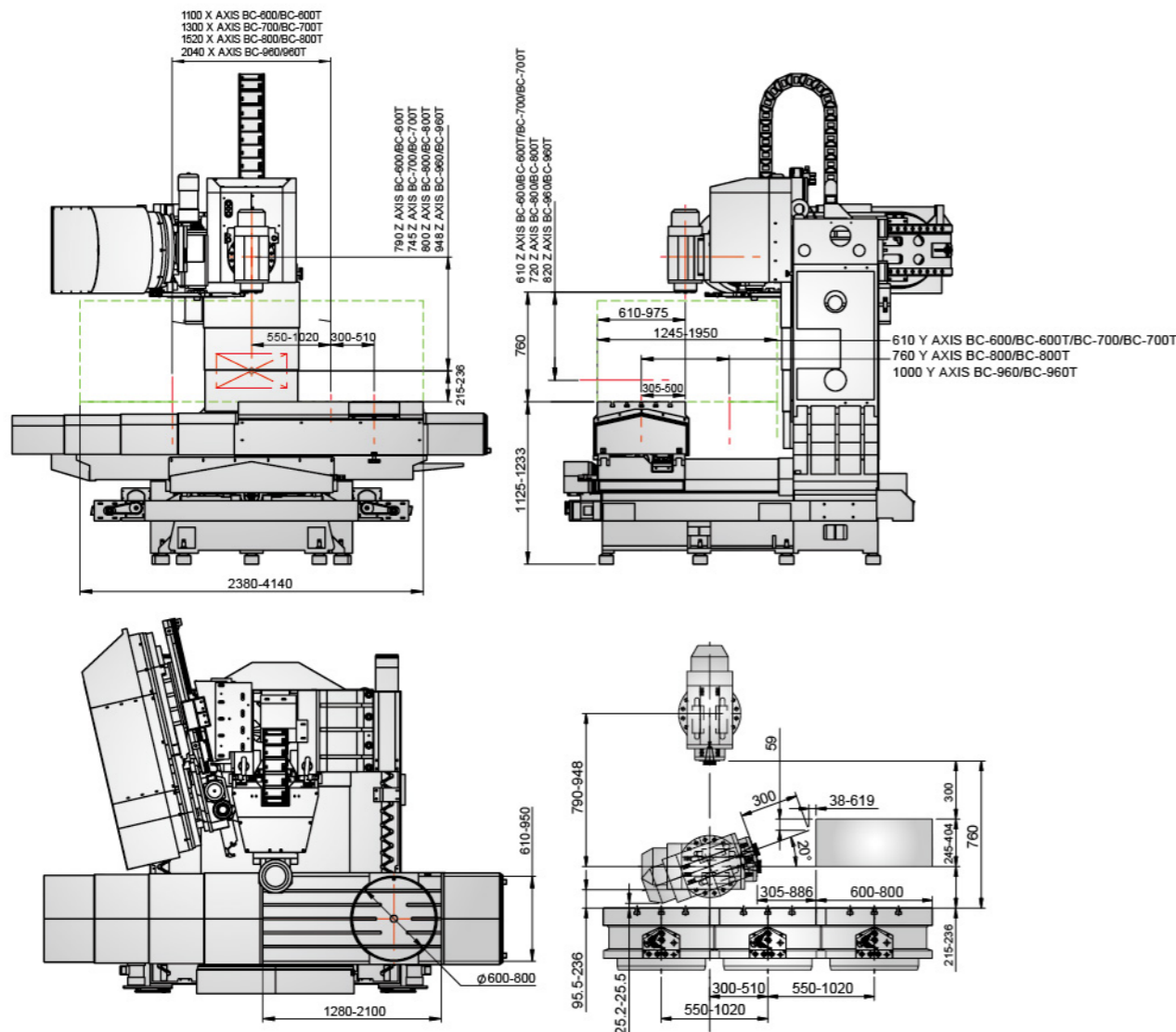


# DIMENSIONS

## OUTLINE DIMENSION



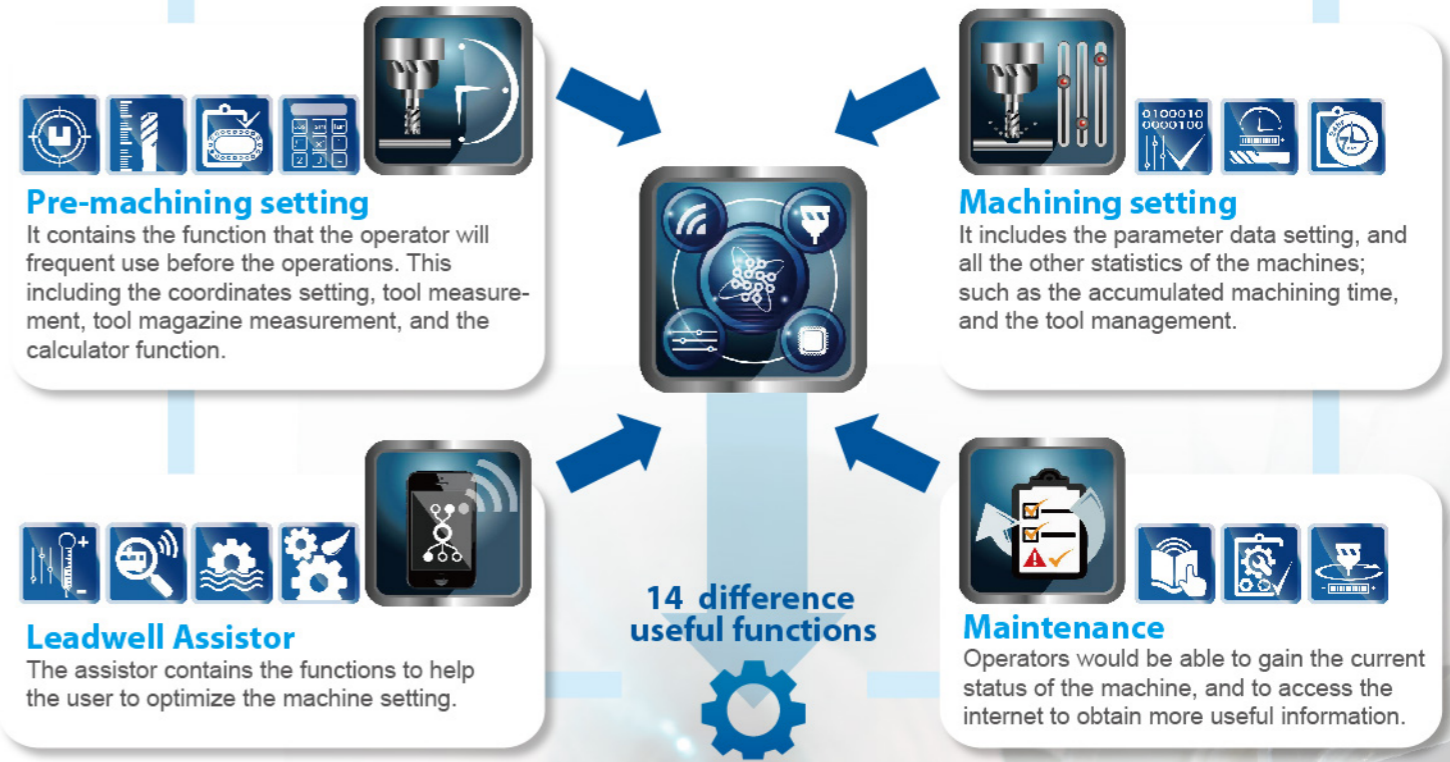
## INTERNAL DIMENSION



# LEADWELL SMART PROCESSOR

## More than a machine

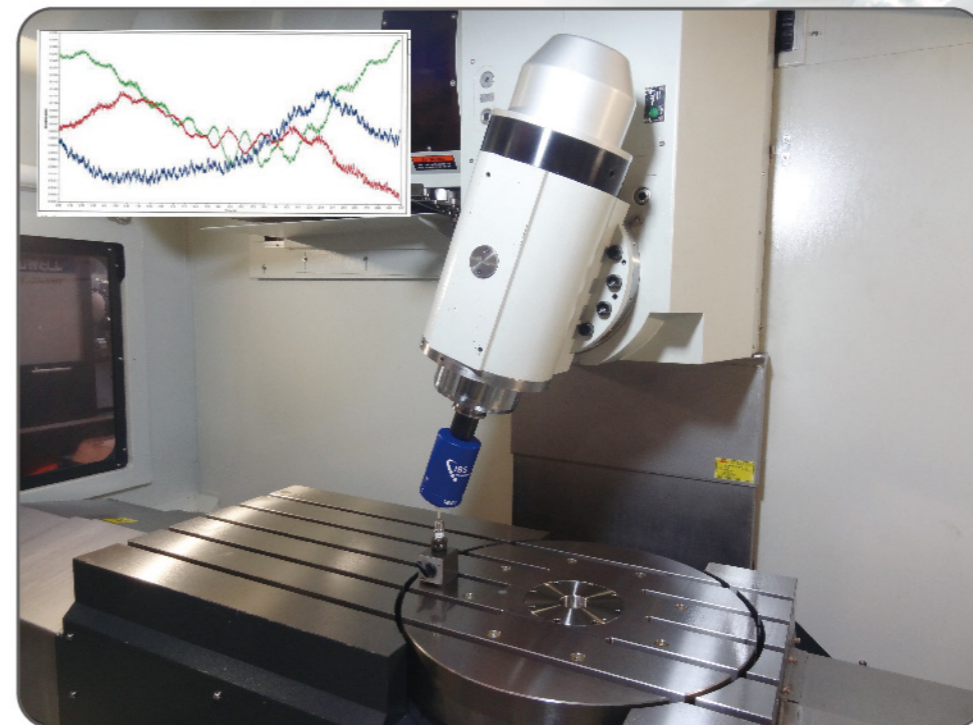
Leadwell is never simply about building a machine and to launch onto the market. Our years of experience, we learn that the right programs must be developed to ensure the competitiveness of the users.



## Machined work pieces.

Users' full satisfaction have always been Leadwell's main focus.

## Volumetric Accuracy Control

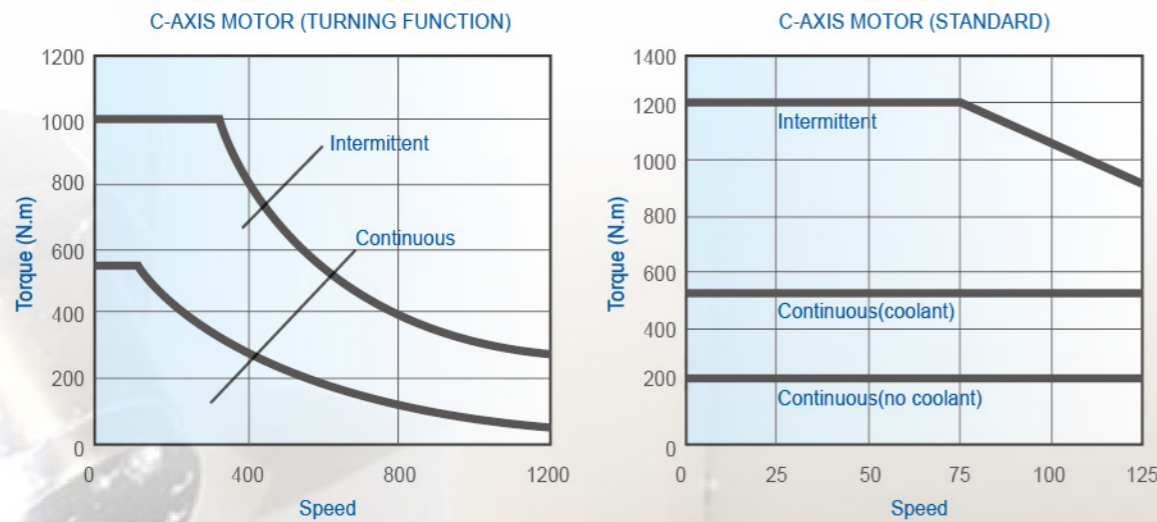


- Leadwell optimizes the parameter data and consequently dominates the total acceptance of the machine.



# TURNING FUNCTION

1. The turning function's processing time is shorter than milling. When the work-piece needs turning, the overall processing efficiency is more rapid than milling.
2. The milling spindle can have Multi-point positioning function, it can use the compound turning tool to reduce the tool change time.
3. Turning diameter up to 650mm, suitable for large diameter work-piece processing.
4. The Controller with turning and milling function selection mode, the user can according to different processing needs to make mode conversion.
5. For the turning function, the B-axis motor is equipped with a toothed clutch to strengthen the positioning load ability.
6. C-axis motor specifications synchronous optimization, taking into account all types of processing needs.
7. When the customer needs turning function, the tool system will switch to 63T (HSK) as standard, the user follows different needs to change milling or turning tools.



# MACHINE SPECIFICATIONS

ITEM	MODEL	BC-600 / BC-600T	BC-700 / BC-700T	BC-800 / BC-800T	BC-960 / BC-960T
<b>CAPACITY</b>		Unit			
X axis	mm(in)	1100(43.3)	1300 (51.2)	1520 (59.8)	2040(80.3)
Y axis	mm(in)	610(24)	610 (24)	760 (29.9)	1000(40)
Z axis	mm(in)	650(25.6) VERTICAL 790 (31.1) HORIZONTAL	610 (24) VERTICAL 750(29.5) HORIZONTAL	720 (28.3) VERTICAL 790(31.1) HORIZONTAL	820(32.2) VERTICAL 948(37.3) HORIZONTAL
Distance from table top to spindle end	mm(in)	110-760(4.3-29.9)	110-720(4.3-28.3)	110-830 (4.33-32.67)	120-940(4.8-33.6)
Distance from table top to spindle center	mm(in)	215-1005(8.5-39.6)	215-965(8.5-38)	275-1075 (10.8-42.3)	236-948(8.5-39.6)
Distance from column front to spindle center	mm(in)	691.5(27.2)	691.5 (27.2)	817 (32.2)	1045(41.8)
<b>TABLE</b>					
Table size(LXW)	mm	Ø600(23.62) ROTARY 1280X610(50.4X24) TABLE	Ø600 (23.62) ROTARY 1480X610 (58.3X24) TABLE	Ø650 (25.59) ROTARY 1700X650 (66.9X25.6) TABLE	Ø800(31.5) ROTARY 2100X1000(72.7X40) TABLE
Max. table load weight	Kg	400 ROTARY 1400 TABLE	400 ROTARY 1600 TABLE	400 ROTARY 1800 TABLE	400 ROTARY 1600 TABLE
Min indexing unit	degree	0.001 ROTARY			
T-slot size	mm(in)	18Tx100x5	18TX100X5	18TX125X5	18TX100X9
<b>SPINDLE</b>					
Spindle speed	rpm	15000/12000			
Spindle nose (normal size, NO.)		7/24 Taper, No. 40 / HSK-T63			
Max. spindle torque	Nm(lbw.ft)	95 (70)			
Tilting angle range	degree	+110° ~ -110°			
C axis speed	rpm	120/800			
<b>FEED RATE</b>					
Rapid traverse X/Y/Z	m/min(IPM)	36/36/30 (1417/1417/1182)	36/36/30 (1417/1417/1182)	30 (1182)	24/24/20 (945/945/787)
Max. cutting feed rate	m/min(IPM)	10(394)	10(394)	10(394)	10(394)
<b>ATC</b>					
Tool storage capacity	pcs	30	30	30	30
Max. tool diameter (with adjacent tools/without adjacent tools)	mm(in)	85/125 (3.34/4.92)	85/125 (3.34/4.92)	85/125(3.34/4.92)	85/125(3.34/4.92)
<b>MOTORS</b>					
Spindle motor(30min/cont)	Kw	31.5/21	31.5/21	31.5/21	31.5/21
X/Y/Z axis feed moter	Kw(HP)	4/7/7 (5.4/9.3/9.3)	7/7/7(9.3/9.3/9.3)		7/6/7(9.3/8/9.3)
<b>MACHINE SIZE</b>					
Height of machine (H)	mm(in)	3450(135.8)	3450(135.8)	3930(154.7)	4085(160)
Outline space(LXW)	mm(in)	4710X3830 (185X150)	4710X4200 (185X165)	4710X4200 (185X165)	5466X4135 (215X163)
Total machine weight	Kg	12000	13000	14000	18600
Power requirement	KVA	65	65	65	65
Controller		Oi-M	Oi-M	Oi-M	Oi-M

## STANDARD ACCESSORIES

- Full enclosure guarding
- Chip conveyor (auger type)
- Work light
- Alarm lamp
- Rigid tapping
- Auto counter for work piece
- Remote MPG
- Surrounding coolant system
- Linear scale
- Chip conveyor outside machine & chip bucket
- Air conditioner
- Spindle annular coolant jet (Arm type ATC)
- Spindle oil chiller

## OPTIONAL ACCESSORIES

- 10000rpm spindle
- 12000rpm spindle
- CTS From A
- Tool tip air blow system
- Tool overload detection
- Auto tool length measurement (ATLM)
- Automatic workpiece measurement
- Simple tool life management
- Oil skimmer
- Coolant gun
- Through hole drill kit
- DNC link software
- CTS preparation
- Extra coolant tank
- ARM (40T) ATC
- Auto door
- Programmable nozzle
- Programmable air blow