



- Quality Is Our Nature
- In Search of Excellence
- LEADWELL Leads the Industry in Taiwan, in the World

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



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※ All performance are based on 220V/3PH/60HZ. Specification are subject to change without notice.

**TM Series**

**Multi-Tasking Machine**  
TM-1000/TM-1000S  
TM-1700/TM-1700S  
TM-2000/TM-2000S

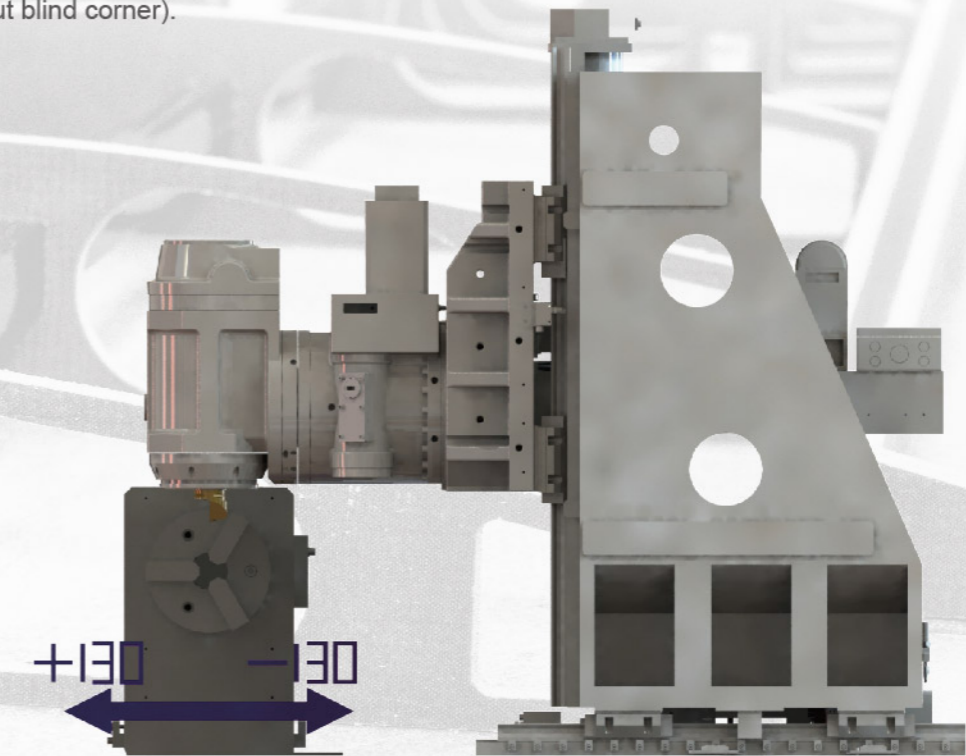
## LEADWELL APPLIES ADVANCED CONCEPTS TO CREATE PERFECTION IN STRUCTURAL DESIGN.

- LEADWELL uses only top quality well-ribbed castings
- Finite Element Analysis(FEA) is used on each new casting to determine the size and location of all internal ribs ensuring high torsional stiffness and minimum vibration.
- The cast iron base, saddle, headstock, slide and tailstock are ruggedly constructed for superior stability and machining accuracy.
- X、Y、Z three axis moving column structure, cooperate with B axis and electro spindle offering structure stability.
- High torque electron spindle, increased spindle cutting ability and productivity.
- 40T Tool magazine.
- 3,500 rpm main/sub spindle.

ITEM	TM-1000S	TM-1700S	TM-2000S
Max. swing	750	750	750
Max. turning diameter	730	730	730
Max. turning length	1000	1700	2000
Y axis travel	±130	±130	±130
B axis travel	-30 ~ +210	-30 ~ +210	-30 ~ +210
Chuck spindle	A2-8/10" 78mm/3500rpm	A2-8/10" 78mm/3500rpm	A2-8/10" 78mm/3500rpm
Sub chuck spindle	A2-8/10" 78mm/3500rpm	A2-8/10" 78mm/3500rpm	A2-8/10" 78mm/3500rpm
Electronic spindle	12000rpm (Max. torque 62.1Nm) (CAPTO C6) or (OPT. HSK-T63)		
Tool storage capacity	40T (OPTIONAL:80T)		

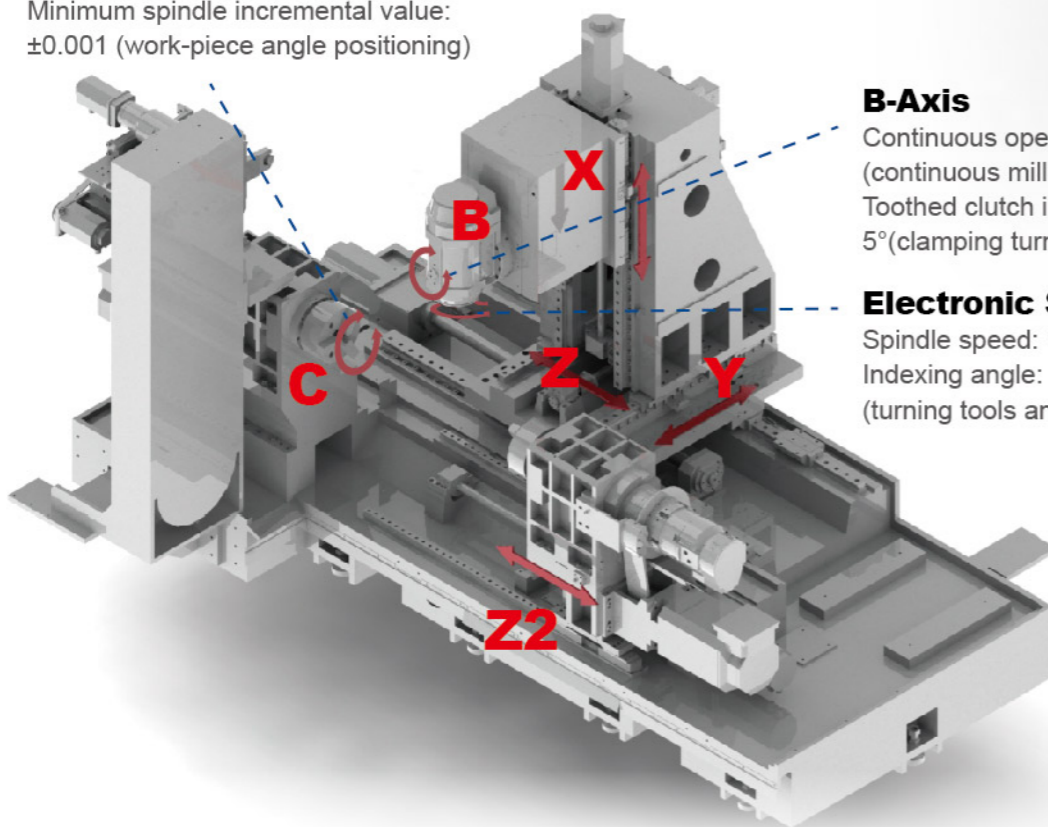
## Orthogonal Y axis design, stable structure with out blind corner.

- Cooperating with the moving column, it can have a full range of movement (Y axis travel +/-130mm, without blind corner).



### C-Axis(Chuck Spindle)

Minimum spindle incremental value:  
±0.001 (work-piece angle positioning)



### B-Axis

Continuous operation angle: 0.001°  
(continuous milling)  
Toothed clutch indexing angle:  
5°(clamping turning)

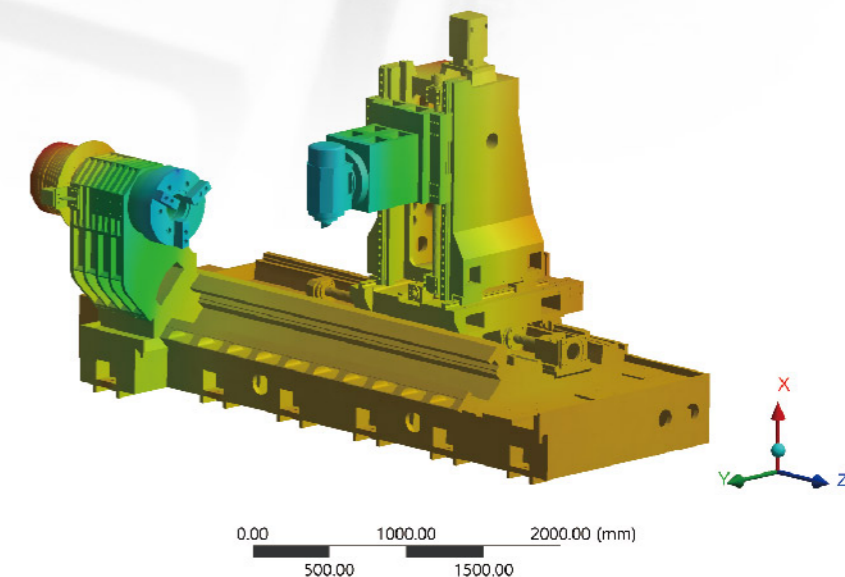
### Electronic Spindle

Spindle speed: 12000rpm  
Indexing angle: 15°  
(turning tools angle adjustment)

## FEA REPORT(Finite Element Analysis)

### With FEA you can:

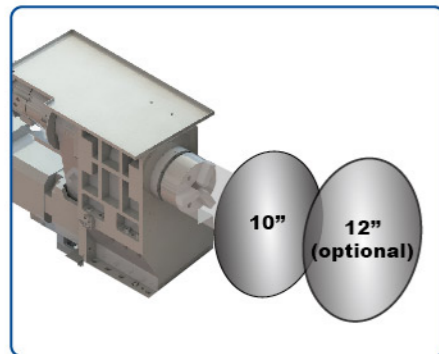
- Predict and improve product performance and reliability.
- Reduce physical prototyping and testing.
- Evaluate different designs and materials.
- Optimize designs.



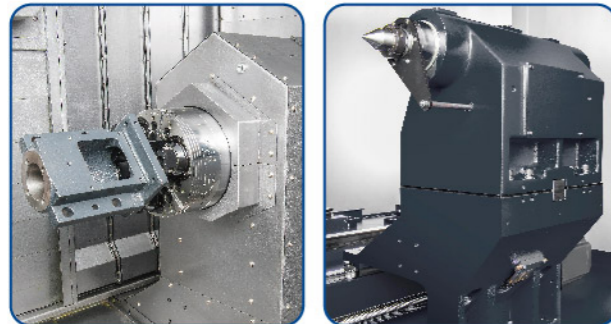
# SPINDLE

- The machine is equipped with an electronic spindle which can reach 12000 rpm with torque strength of 62.1Nm, for all roughing and final cutting needs.
- Tool System: Capto C6(HSK-T63 optional)
- Chuck spindle motor power 40%(100% continuous): 26.4/22kw
- Chuck spindle motor torque 40%: 354.2Nm
- Electronic spindle speed:  $\geq 12,000$ rpm
- Electronic spindle motor power 40%: 20.8kw
- Electronic spindle motor torque 40%: 62.1Nm

Chuck size	10"/12" optional
Bar capacity	$\phi 78$



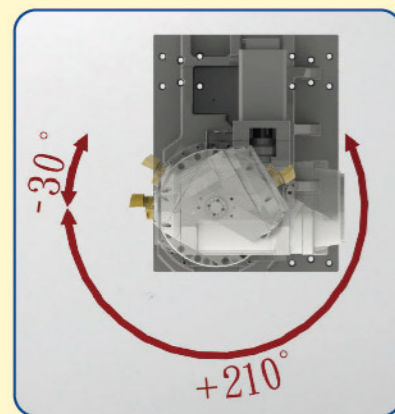
## SUB SPINDLE & TAILSTOCK (optional)



Available upon request.

- Sub spindle :10"
- Tailstock : MT5

## B AXIS



### B axis with the tooth clutch (STANDARD)

- The B-axis turning machine offers not only 4+1 axis control but also 5 axis simultaneously machining (optional), no matter face of the drilling, milling, oblique hole, surface or lathe processing are readily available.
- Roller cam non backlash with crank teeth clutch bite design.
- Max. Torque 3000NM
- Min. Index accuracy 0.001 degree
- Purposed for Heavy cutting and surface milling operations.

# B AXIS MOTOR SPINDLE

## Spindle Clamping

### Turning Spindle Clutch

- Increased rigidity
- Minimize bearing wear
- Output accuracy of  $\leq 0.02$ mm/150mm

## Spindle Transmission

### Induction Motor

- Cutting speed unaffected by material resistance
- 16Kw(S1)/20.8Kw(S6)
- 48Nm(S1)/62.1Nm(S6)

## B-Axis Spindle Clamping

### 3 Component Clutch

- Improved turning and milling stability/rigidity
- High position accuracy
- +7.5/-7.5 sec

## B-Axis Transmission

### Roller Cam Drive System

- Roller system decreases wear
- Transmission efficiency (>90%)
- Speed (60RPM), minimal backlash, improved work time

## Tool System

### Sandvik Certified CAPTO 3 Point Surface Contact

- Made in Taiwan factory certification
- Rigidity increased by 100%
- Tool Nose Accuracy 0.002mm

• Max. Processing Diameter :  $\phi 730$ mm

## Swivel Head

### (Turn-mill multifunction head)

- Build-in 2 set 48 tooth Hirth coupling
- Increase bearing outer diameter, making
- Direct drive motor: small volume \ efficiency \ low temperature rise \ large starting torque

Coolant through spindle: 80bar  
Max. torque: 120Nm  
Max. speed: 12,000RPM

Air pressure detect tool clamping position

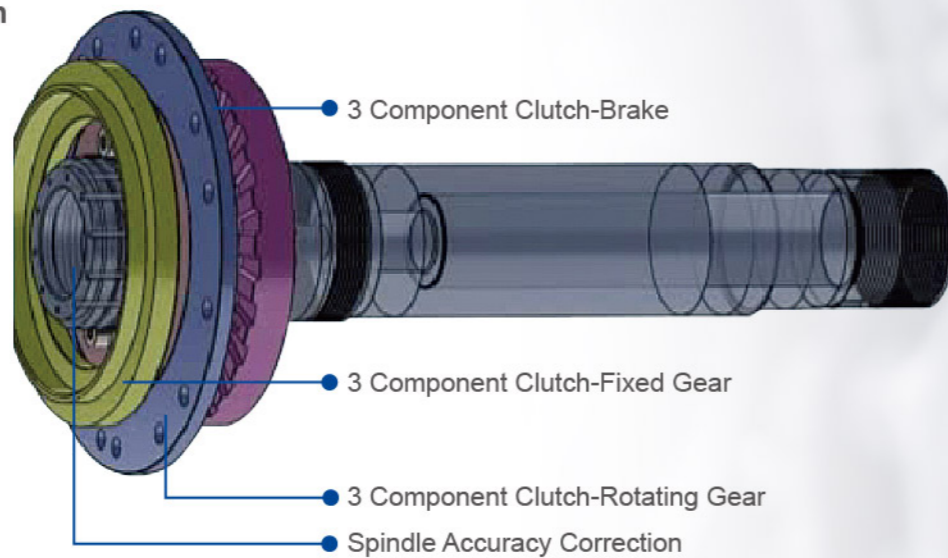
Various tool system (HSK, CAPTO)

First set: Lock when the turning, increase rigidity

Second set: Release bearing preload during turning to extend service life.

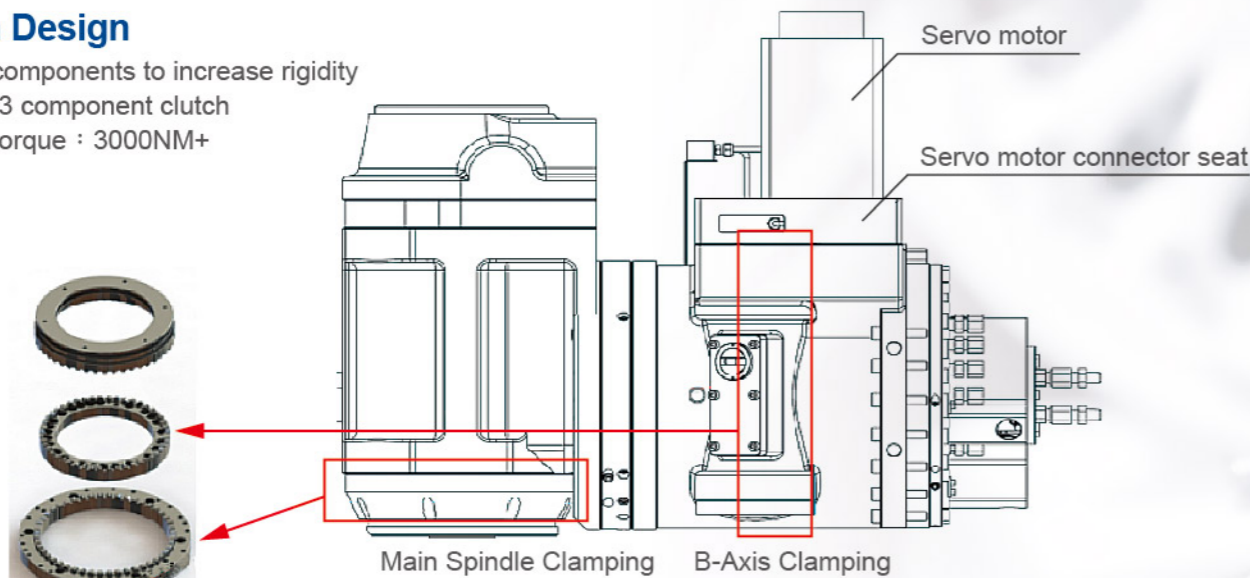
## Turning Preparation

Milling operation



## Clutch Design

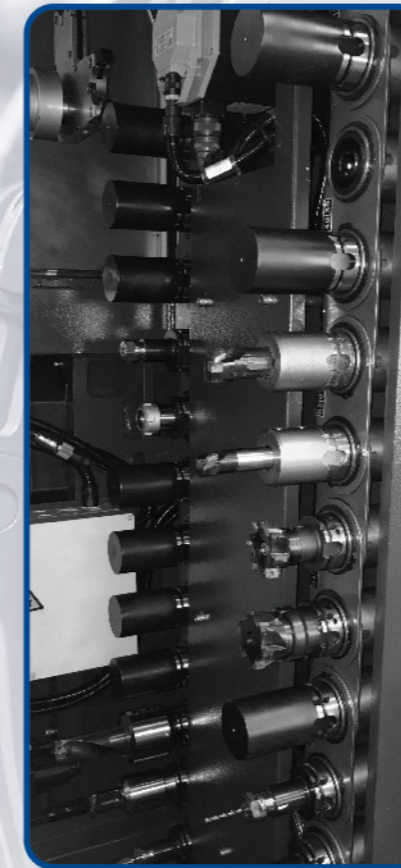
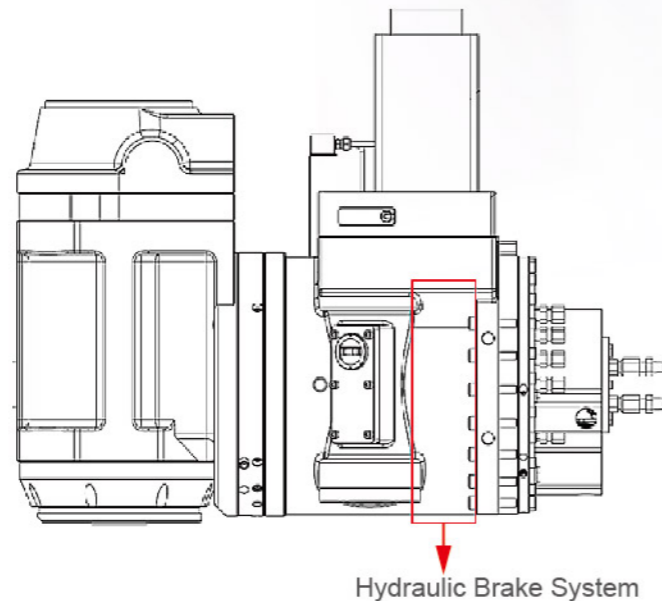
- Three components to increase rigidity
- B-Axis 3 component clutch
- Brake torque : 3000NM+



3 Component Clutch

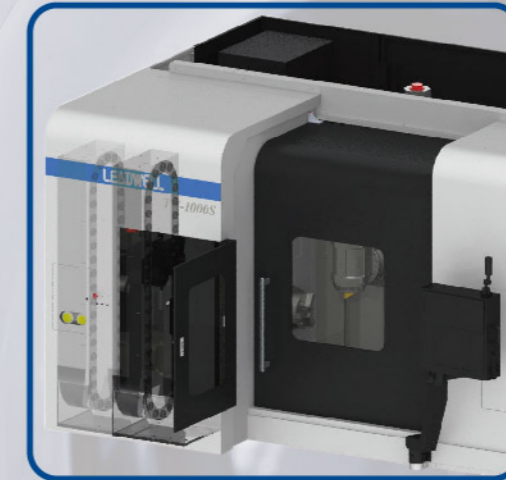
## Hydraulic Brake

B axis spindle brake capable of machining any customizable angles for greater machining rigidity  
Brake torque maximum 1800NM



## Flexible tool magazine design

- Horizontal design
- Increased storage
- 40T standard, (80T and 120T also available)



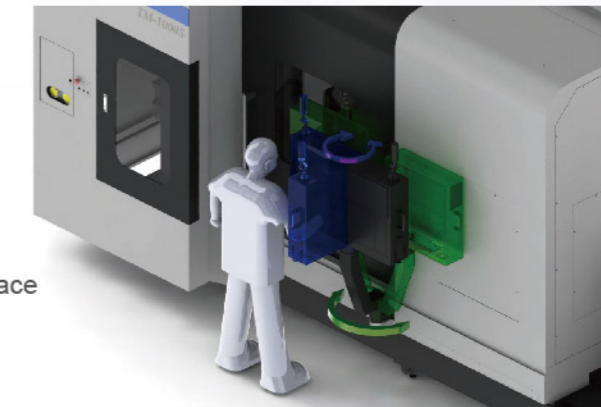
The standard stock of 40 tools placed in front of the machine, thus avoiding all the operator needs to move forward and backward the machine. (Option: 80-stock tools)

- Maximum tool length : 350mm
- Maximum tool diameter : 90mm
- Maximum tool weight:8kg

## ERGONOMIC DESIGN EASY OPERATION

### Places the operator closer to the machine

- Operation box with double shaft, high degree of freedom.
- Panel height follow operator's standard view high
- Large viewing window for easy viewing of workpieces.
- The door of the tool changer, make the operator easy to replace the tool and view the magazine situation.

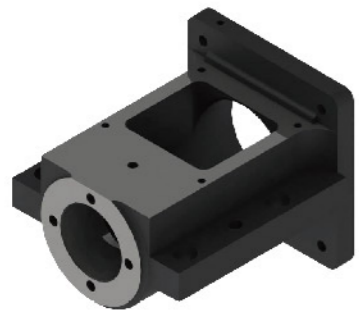


# MAN-HOUR EVOLUTION

The concept of "Man-Hour evolution" realizes all processing-processes from raw material to finished piece in a single-machine placement. The advantages are numerous: significant reduction: lead time: (crossing time), better machining accuracy, reducing the cost by reducing the number of machines, equipment and tools used, the smaller number of operators involved, real improvement of 'environment work. We can therefore say that the concept done not only shortening the product development process, but also improving the overall management.

# MAN-HOUR EVOLUTION

## Conventional Machining Processes



rotor shaft

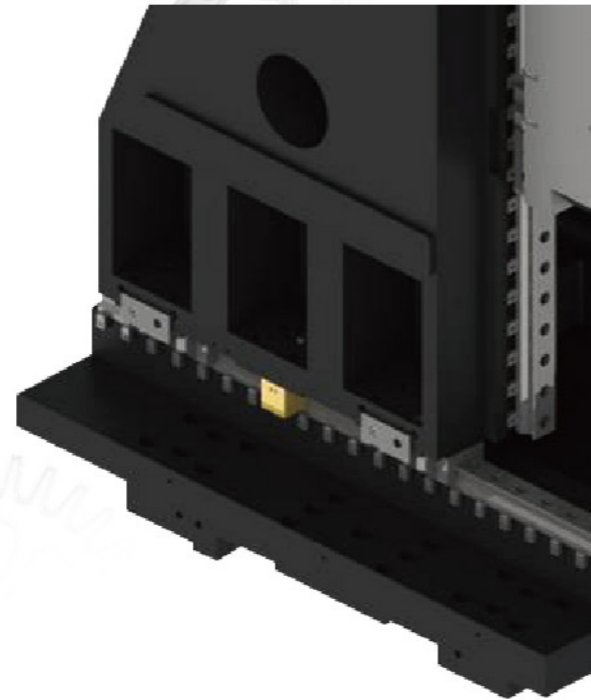
## LEADWELL TM SERIES



# Y AXIS GUIDE WAY PNEUMATIC BREAK (OPTIONAL)

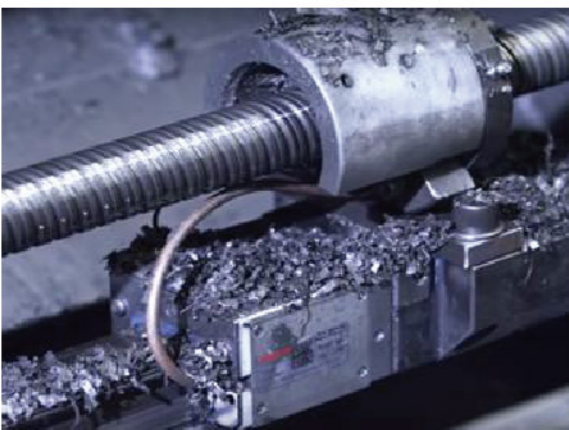
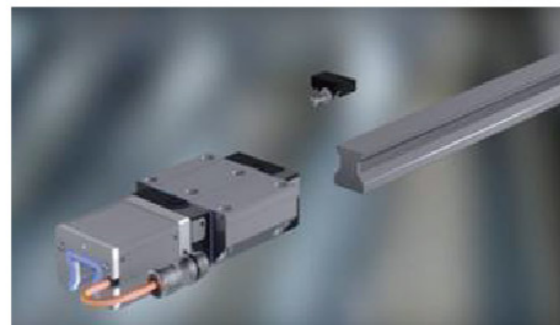
## Y axis guide way pneumatic break for increased the turning stability

- Bosch Rexroth guide way pneumatic block
- Guideway pneumatic break
- Increased turning stability
- Modular design, easy to install



## Integrated Measuring System (Optional)

Resistant to pollution and vibration.  
Use non-contact system design, no wear.  
Modular design, easy to replace.



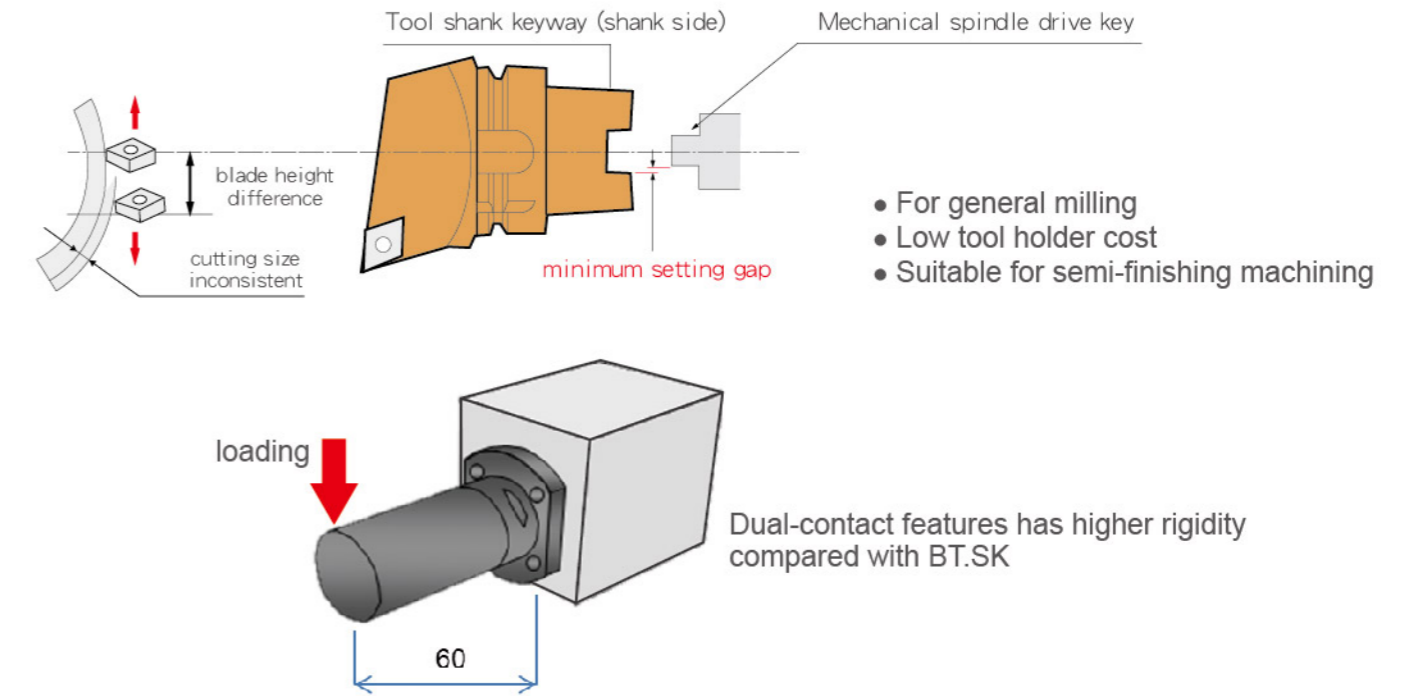
## High accuracy, best alternative

Repeatability: +/- 0.25  $\mu\text{m}$ .  
Position resolution: 0.025  $\mu\text{m}$ .  
System accuracy: +/- 4  $\mu\text{m}$  / m.  
Linear expansion coefficient such as steel:  $11 \times 10^{-6}$  K<sup>-1</sup>.  
Even in the dynamic load

# TURN-MILL SPINDLE TRANSMISSION SYSTEM

## General milling

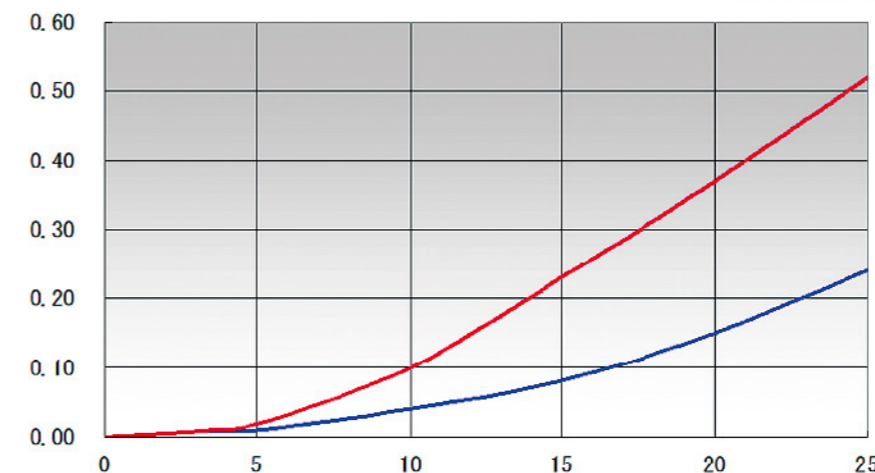
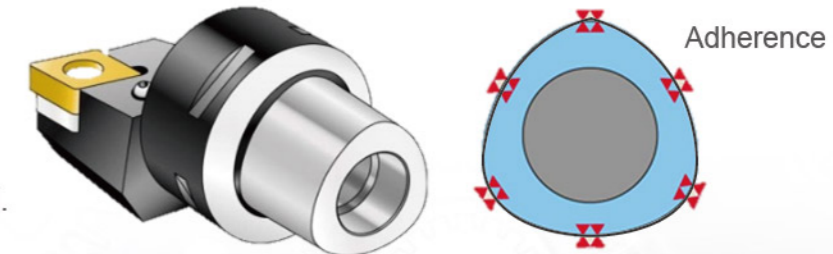
### HSK63 interface



## Milling and turning are applicable, cutter arbor for aerospace parts

### CAPTO C6 interface

Taper system without key and gap, tool change position stable, high precise at radial.



Dual-contact spindle with taper, high rigidity of tool (twice of HSK).

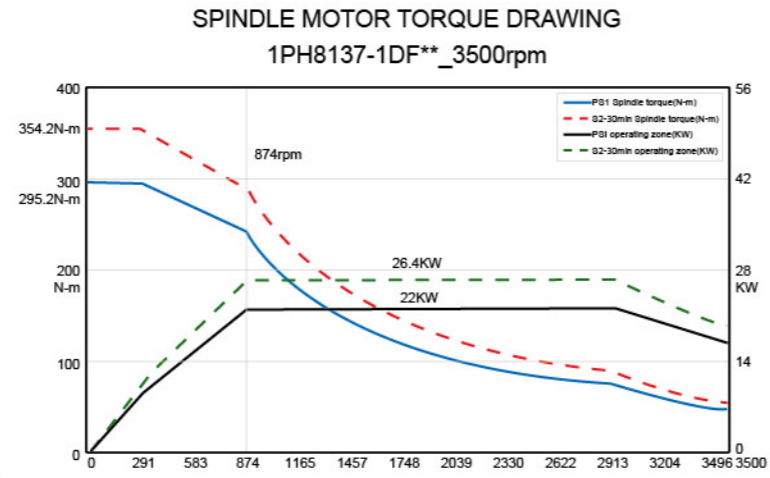
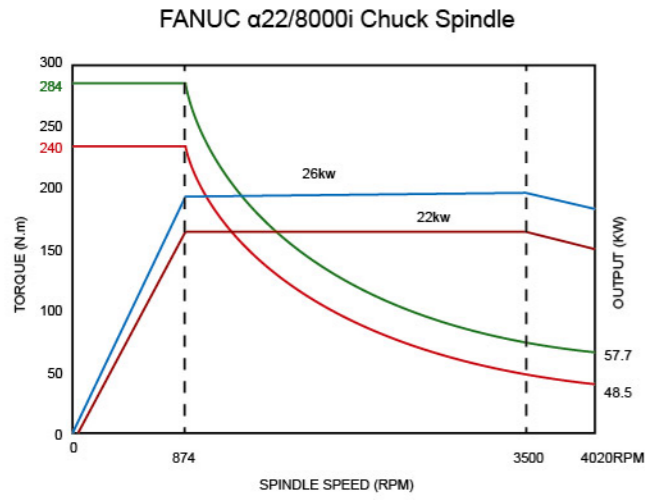
HSK(BLUE)  
CAPTO(RED)

# SPINDLE POWER CURVE

TM-1000/TM-1000S

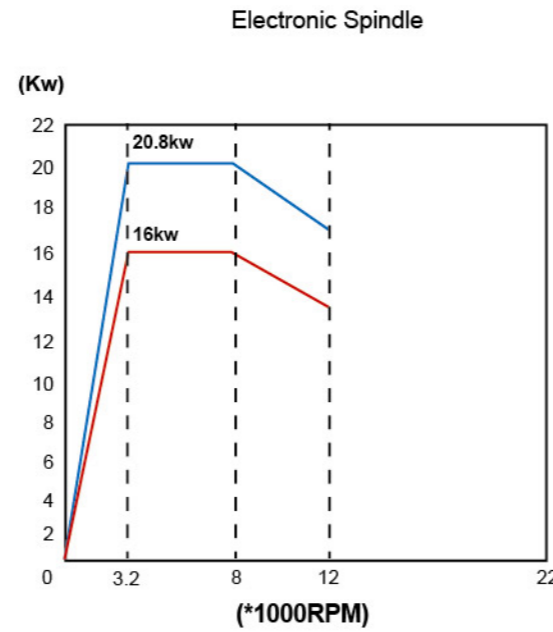
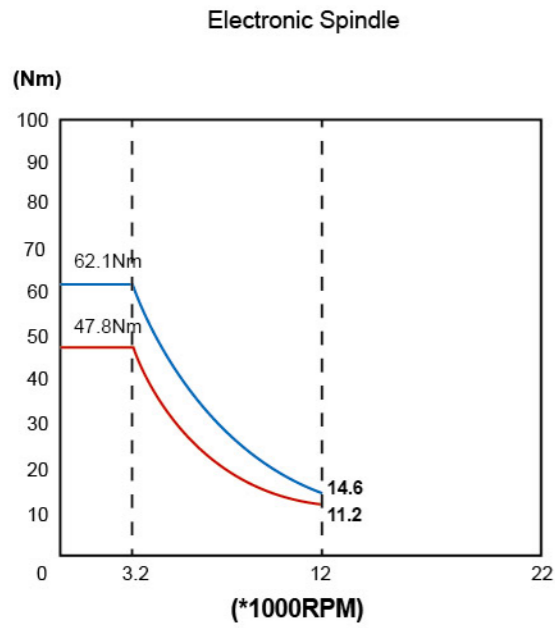
TM-1700/TM-1700S

TM-2000/TM-2000S



Torque diagram

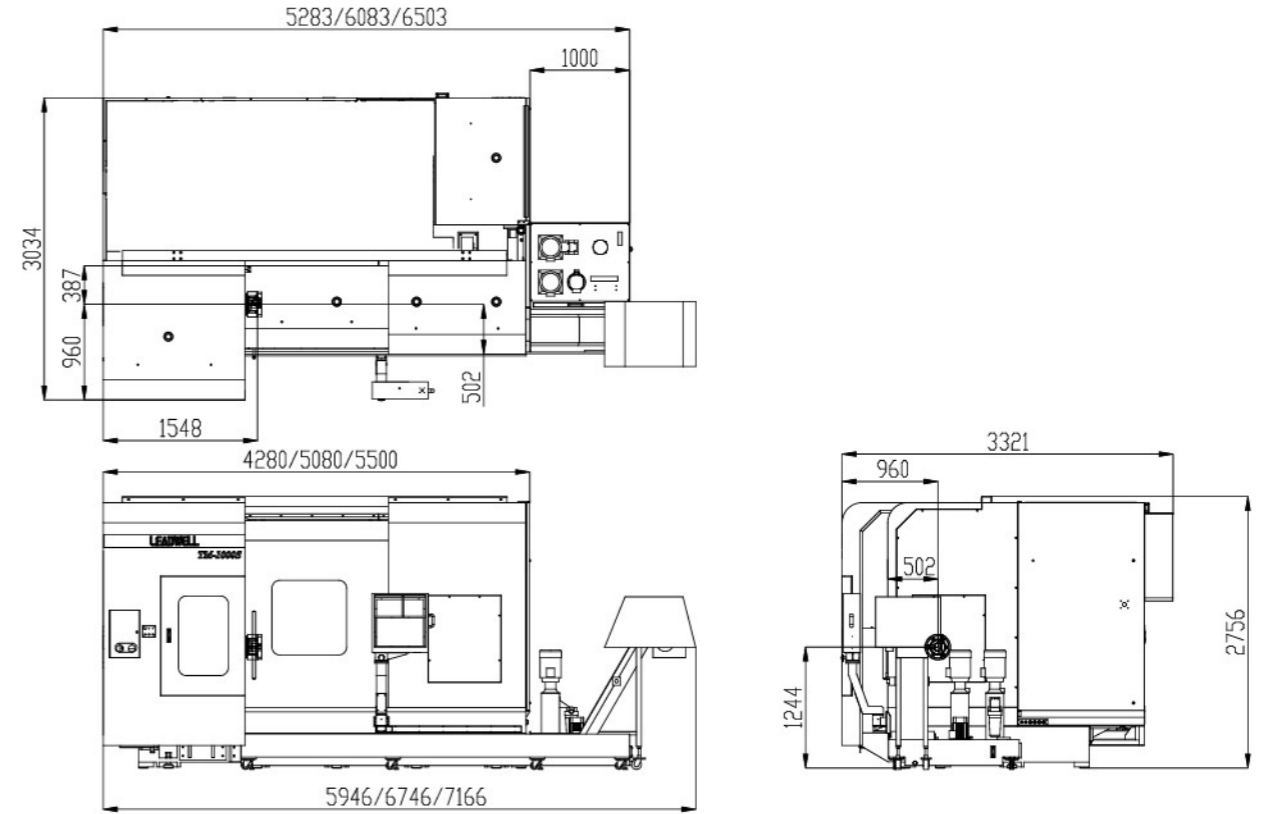
Power diagram



# OUTLINE DIMENSIONS

TM-1000/TM-1700/TM-2000

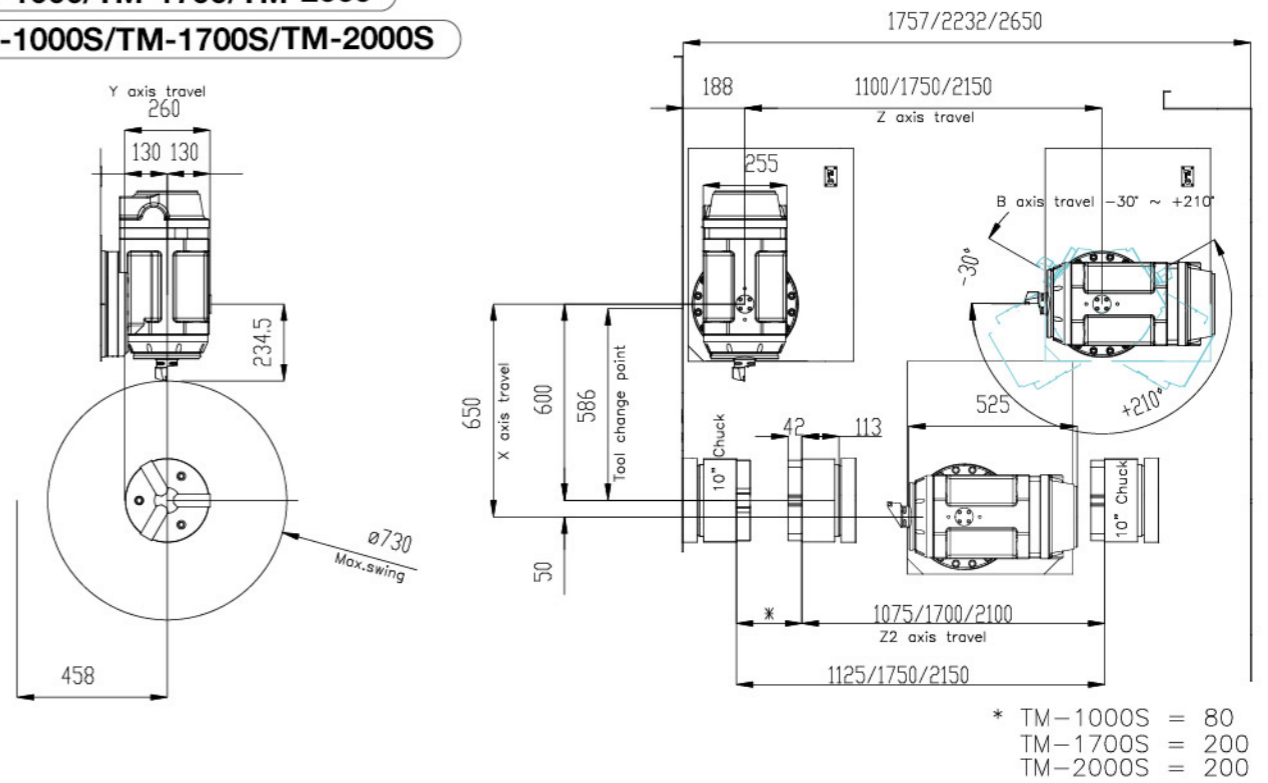
TM-1000S/TM-1700S/TM-2000S



# WORKING CAPACITY

TM-1000/TM-1700/TM-2000

TM-1000S/TM-1700S/TM-2000S



# MACHINE SPECIFICATIONS

ITEM	MODEL	TM-1000/TM-1000S	TM-1700/TM-1700S	TM-2000/TM-2000S
<b>CAPACITY</b>				
	Unit			
Max. swing	mm(in)	750(29.5)	750(29.5)	750(29.5)
Max. turning diameter	mm(in)	730(28.7)	730(28.7)	730(28.7)
Max. turning length	mm(in)	1050(41.33)	1700(66.9)	2000(78.7)
Bar capacity	mm(in)	78(3)	78(3)	78(3)
<b>TRAVEL</b>				
X axis travel	mm(in)	600+50(23.6+1.96)	600+50(23.6+1.96)	600+50(23.6+1.96)
Y axis travel	mm(in)	±130(5.11)	±130(5.11)	±130(5.11)
Z axis travel	mm(in)	1100(43.3)	1750(68.89)	2050(80.7)
Z2 axis travel	mm(in)	---/1075(42.3)	---/1725(67.9)	---/1820(71.6)
<b>CHUCK SPINDLE</b>				
Main/Sub Spindle speed	rpm	3500	3500	3500
Main/Sub Chuck size	mm(in)	254(10)	254(10)	254(10)
Main/Sub Type of spindle nose		A2-8	A2-8	A2-8
Main/Sub Spindle motor power	kw(hp)	26(34.8)	26.4(35.4)	26.4(35.4)
<b>ELECTRONIC SPINDLE</b>				
Spindle speed	rpm	12000	12000	12000
Type of spindle nose		Capto C6	Capto C6	Capto C6
Spindle motor power (HOLDWELL/SAUTER)	kw	20.8/44.6	20.8/44.6	20.8/44.6
Spindle torque (HOLDWELL/SAUTER)	Nm	62.1/109	62.1/109	62.1/109
<b>B AXIS</b>				
Angular stroke	Deg	240°(-30°~+210°)	240°(-30°~+210°)	240°(-30°~+210°)
Index clamping angular	Deg	5°	5°	5°
Max. torque clamping (HOLDWELL/SAUTER)	Nm	3000/6000	3000/6000	3000/6000
<b>A.T.C</b>				
Tool shank		Capto C6	Capto C6	Capto C6
Tool storage capacity	pcs	40	40	40
<b>FEED RATE</b>				
X/Y/Z axis rapid traverse	m/min(ipm)	30/24/30(1181/944/1181)	30/24/30(1181/944/1181)	30/24/30(1181/944/1181)
<b>MACHINE SIZE</b>				
Height of machine (H)	mm(in)	2726(107)	2726(107)	2726(107)
Floor space (LXW)	mm(in)	6084X3321(240X130.7)	6900X3321(271.65X130.7)	7500X3321(295.2X130.7)
Total machine weight	Kg	15000	16800	19000
Power requirement	KVA	95	95	95
Controller	FANUC	0i-T/840D	0i-T/840D	840D

## Control Panel OPTION



FANUC



SIEMENS

# MACHINE ACCESSORIES

NO.	Description	TM-1000/TM-1000S	TM-1700/TM-1700S	TM-2000/TM-2000S
1	Full enclosure guarding	●	●	●
2	Chip conveyor (auger type)	●	●	●
3	Work light	●	●	●
4	Alarm lamp	●	●	●
5	Air conditioner	●	●	●
6	Rigid tapping	●	●	●
7	Auto counter for work piece	●	●	●
8	Remote MPG	●	●	●
9	Spindle oil chiller	●	●	●
10	C.T.S from A	●	●	●
11	12000rpm spindle	●	●	●
12	Linear scale	■	■	■
13	Auto tool length measurement	■	■	■
14	Auto workpiece measurement	■	■	■
15	Simple tool life management	■	■	■
16	Chip conveyor with bucket	■	■	■
17	Oil skimmer	■	■	■
18	Coolant gun	■	■	■
19	DNC link software	■	■	■
20	Programmable air blow	■	■	■
21	Auto door	■	■	■
22	ARM ATC 80T	■	■	■

●:Standard ■:Optional X: N/A

