

**SIGMA**

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***CNC DOUBLE COLUMN 5 AXIS***  
MACHINING CENTER

## Powerful Multi-task Machining Capability

- Complex plane and surface machining.
- All task can be performed in one clamping, high precision is ensured.
- Reducing processing time, Raising working performance.
- Available for low quantity, multi-type or massproduction work piece manufacturing.
- Suit for the manufacturing of mold making, warm gear, turbine blade \ bio-medical component, aerospace component \ car transmission component.



Work Piece

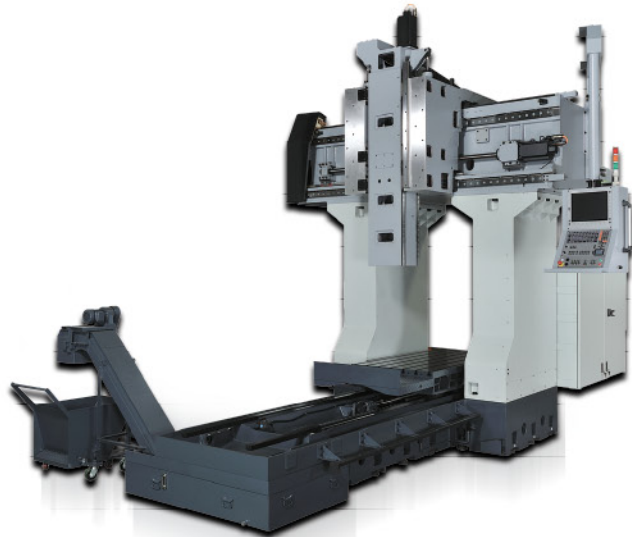
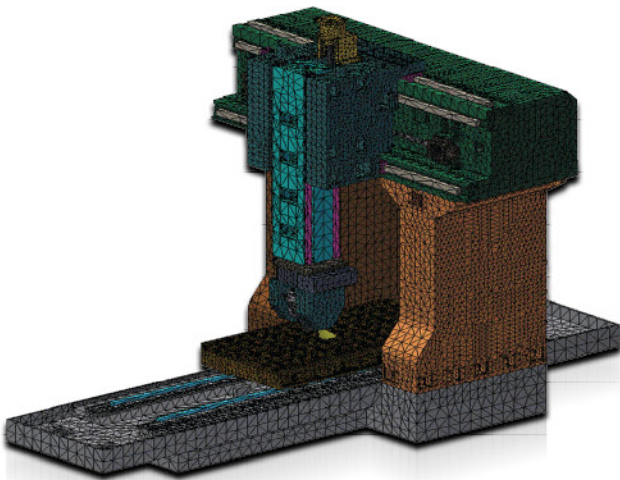


# New Design Paradigm

• High Speed • Heavy Cutting • High Precision

## Features

- ◆ Low-inertia, high-rigidity, optimal stable structure design
- ◆ Box-type, wide-rail, high stability X \ Y \ Z linear guide design
- ◆ Modulized design; thoroughly examin



Servo rotational two-axis head with Germany-made TRAMEC gear-type transmission mechanism or Italy-made TECHNAI direct-drive DD motor transmission mechanism



# Feature of machine structure and mechanism

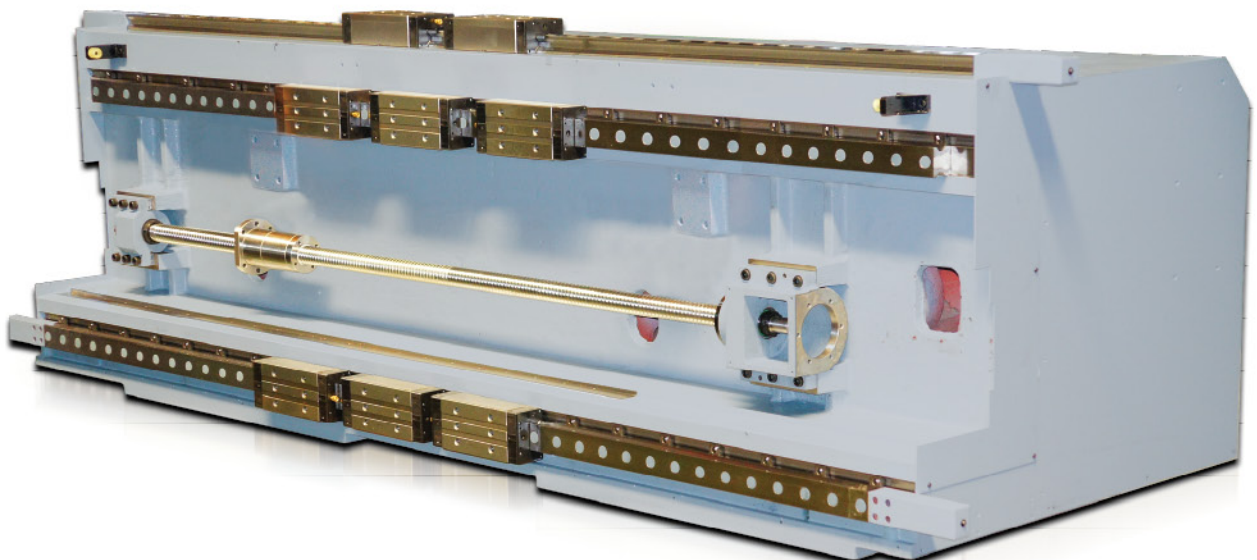
## ◆ High rigidity structure

This machine has rigidity designed into it from the ground up and the base, vertical columns, bridge and head; all incorporate this critical design feature to ensure rigidity and accuracy are maintained throughout the machine. All three axes adopt linear ways with calculated optimal number of multiple seat blocks to share the weight of work piece. This design may reduce friction, increase movement precision and thus a long-term precision of machining can be preserved.

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### 1. Excellent Y-axis design

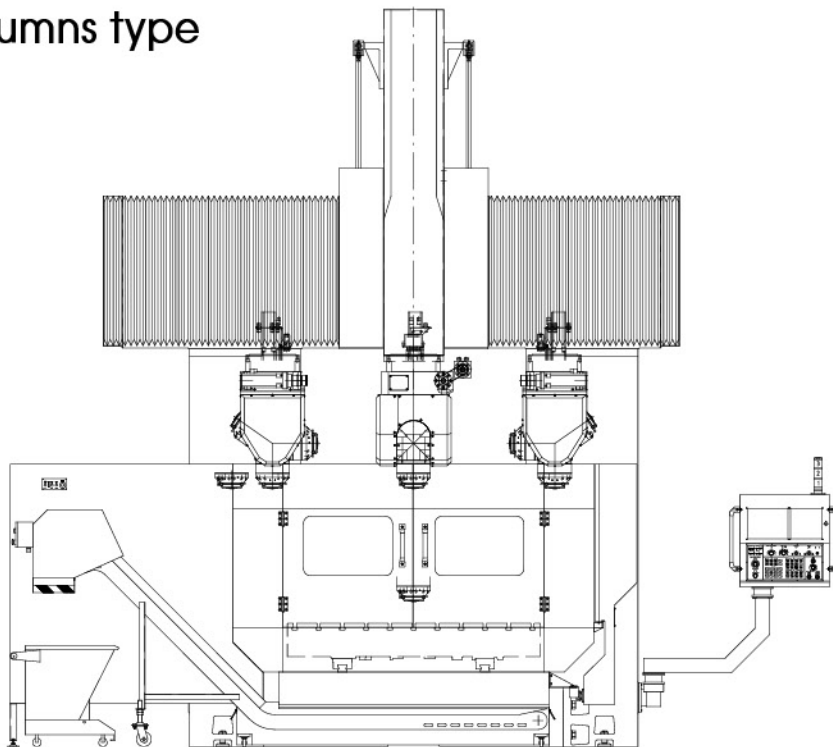
- Three special-designed roller linear guides are adopted in Y-axis unit. One linear guide on the top face and the other two on the front face provide radial and axial stability and strength ensuring low deformation during cutting.



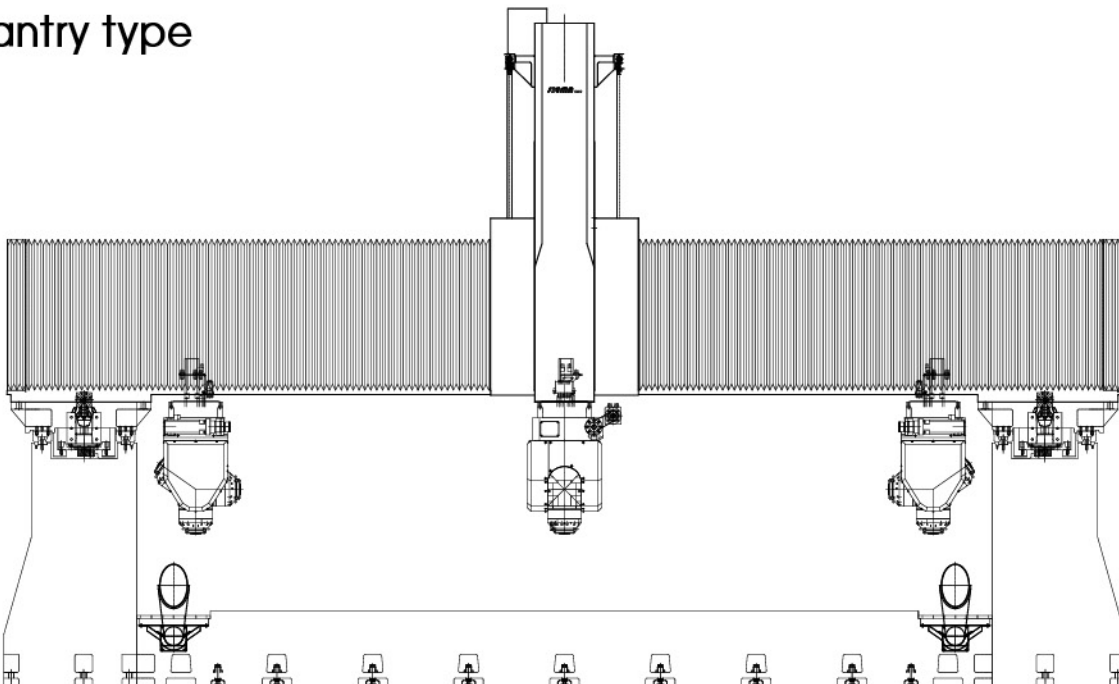
## 2. Design of Bed, Working table, and X-axis

- Bed: Box-type structure with strong interior ribbing support verified by FEM analysis.
- Machine structure size as well as related spec. can be altered according to customer's demand.

### Fixed columns type



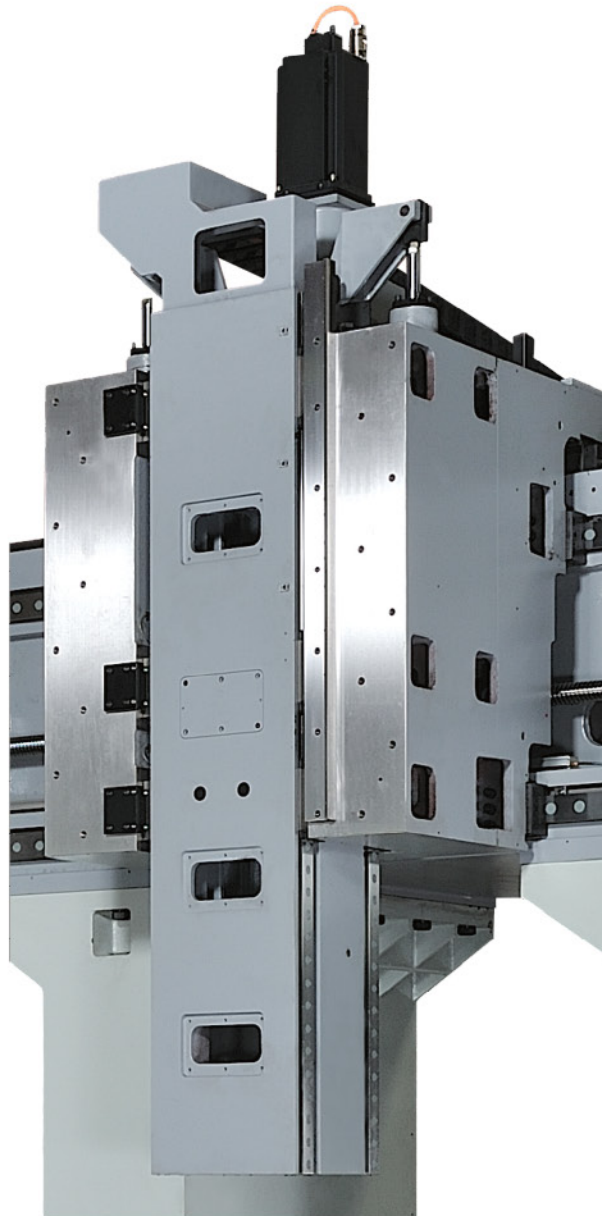
### Gantry type



## 3. Head and Z-axis unit design

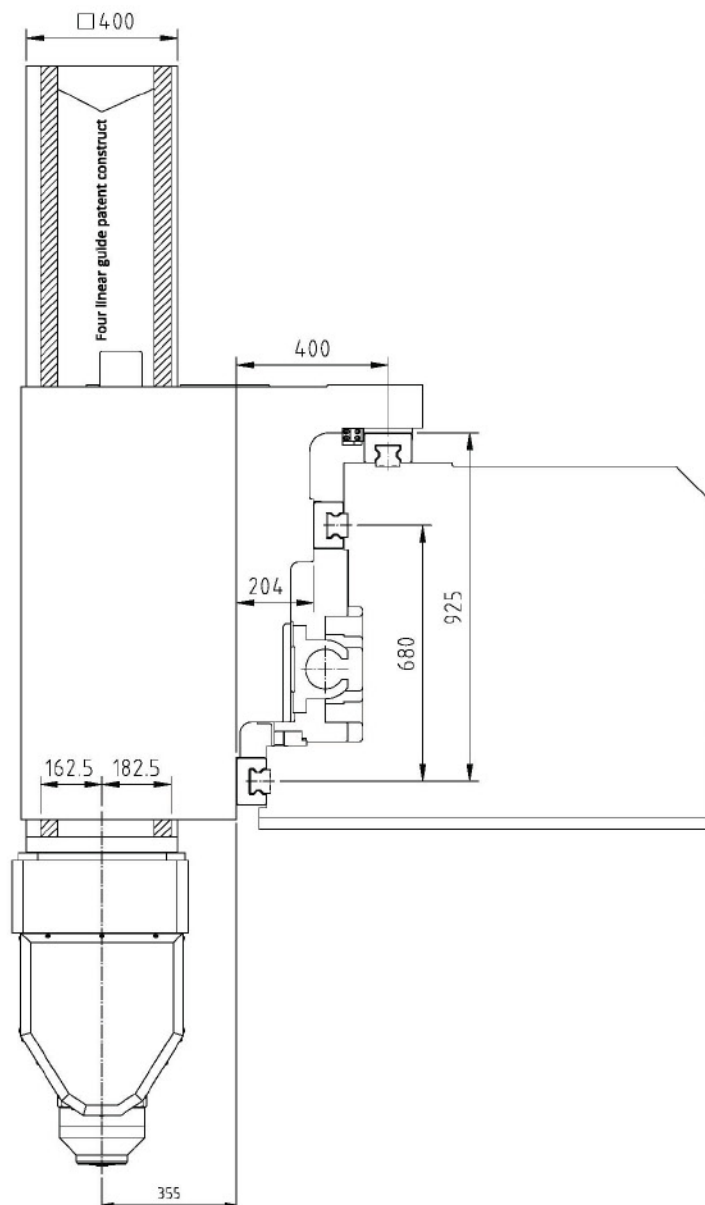
The head on this machine features an adjustable hydraulic balance device to allow easy-Z-axis movement and rapid positioning to ensure perfect conditions for highly accurate operations.

- Distance of spindle central line to Z-axis linear guide way: only 60mm.
- Patented double cylindrical linear guide are used in Z-axis unit.



## 4. Patented structure design

- Cross bridge using three SRG65 patented cylindrical linear guides. These three linear guides have orthogonal arrangement (two on the front face of bridge, one on the top face of bridge) exhibiting higher rigidity (at least increase by 50% )
- Distance between horizontal and vertical rails of Y-axis linear guide is 680mm.
- Distance from spindle centerline to seat block centerline is 355mm.
- Four cylindrical linear guides design of head.
- Cross bridge adopts the trapezoidal structure with suspending length of 400mm.



## 5. Reliable transmission mechanism

### Design of transmission for three axes

- High-grade and pre-loaded ball screw with internal oil-cooling.
- Pre-pulled ball screw seat design in order to reduce the influence of thermal deformation during machine operation.
- Dust and water protection design of transmission bearing, featured with long product life and accuracy preservation .
- Laser inspection ensuring the precision of horizontal and vertical accuracy during assembly.



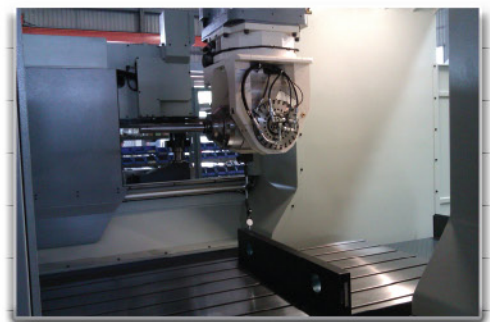
Ball screw Pre-loaded



Straightness check



Laser Inspection



Simultaneous axis inspection



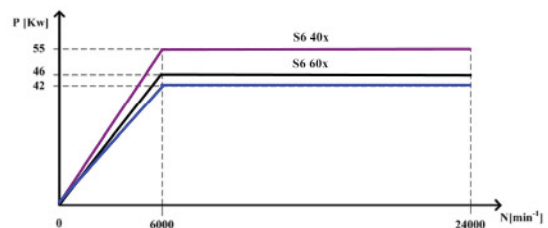
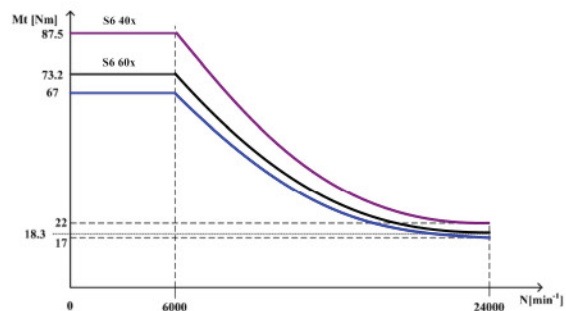
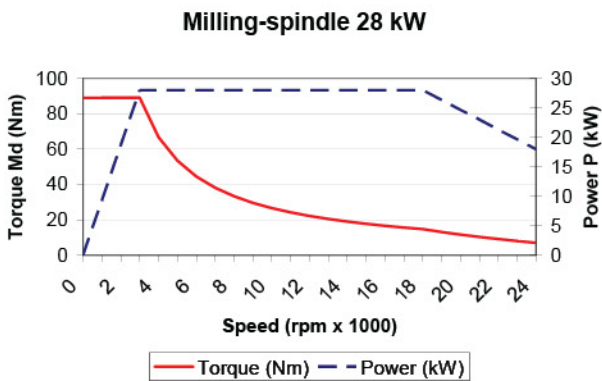
Ball bar test



### Servo two-axis spindle head

Using Germany-made TRAMEC spindle head with inside built-in motor HSK-A63, min. 18000rpm, available Italy-made TECHNAI spindle head, HSK-A63,min. 24000rpm.

MODEL	TRAMEC AC5TK	TECHNAI TCH-20F
TOOL SHANK	HSK-A63 ( HSK-A100 Option )	
<b>A AXIS</b>		
STROKE ANGLE	-95°/+125°	±100°
ROTATING SPEED	41.67°/s	300°/s
AXIS TORQUE SIMULTANEOUS	1,000Nm	600Nm(S1-100%)
AXIS TORQUE CLAMPED	2,000Nm	1,400Nm
<b>C AXIS</b>		
STROKE ANGLE	±360°	±240°
ROTATING SPEED	40°/s	300°/s
AXIS TORQUE SIMULTANEOUS	1,000Nm	700Nm(S1-100%)
AXIS TORQUE CLAMPED	2,000Nm	4,000Nm
MAX. SPINDLE SPEED	max. 18000rpm	max. 24000rpm



## 6. High-usability Ergonomic Design

Swing type revolving control box with MPG hand wheel

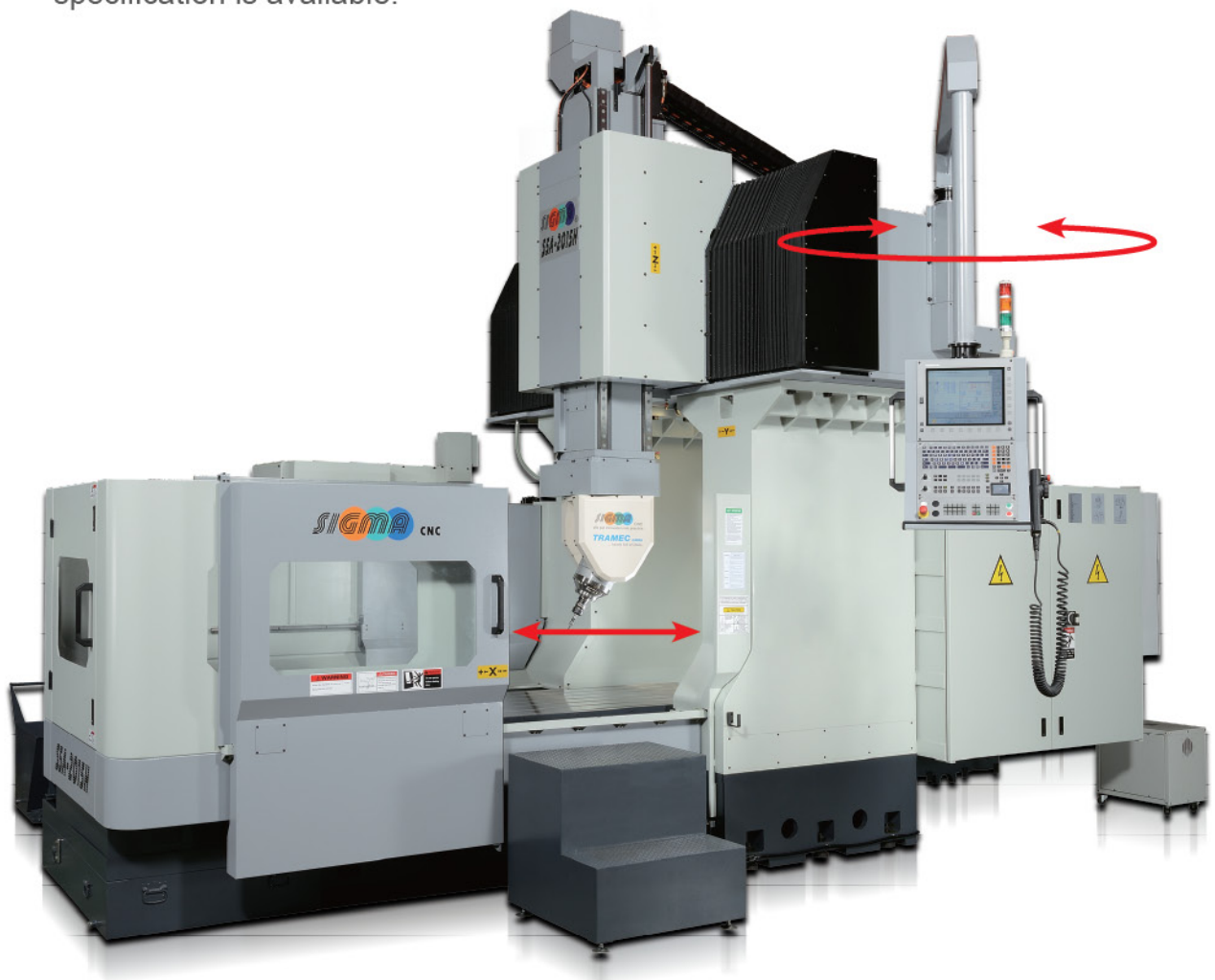
Ergonomic design of control box: easy to use, proper ground height, and can be rotated to any desired angle.

The control box can be arbitrarily chosen as fixed swiveling type or rotary suspending type.

Using the advanced Heidenhain iTNC530 HSCI controller. Users may choose the spindle's type, power, speed, and related size according to their requirements.

### Safety Door design

- Large opening area of safety door, convenient for loading and unloading work pieces.
- Wide distance between two columns and special travel for 3 axis, custom specification is available.





## Accessories

### 1. Standard accessories



Spindle oil cooler



High-pressure automatic lubrication system



Hydraulic power unit

#### Spindle Oil Cooler

- This unit automatic monitors the spindle temperature is adjustable. The pumped oil coolant flows through Z/F gear box and spindle interior, which results in prolonging the spindle and gear box life and preserving the cutting precision.
- High-pressure automatic lubrication system with flow volume distributor.

## 2. Optional accessories

### ATC

The type of ATC and capacity of tool magazine can be altered according to customers' requirement.

Chain type magazine (tool capacity: 32,40,60)

Disk type magazine (tool capacity: 20)



### Tool length & diameter measure equipments



RENISHAW TS-27R



RENISHAW NC4



BLUM NT-A3(A5)

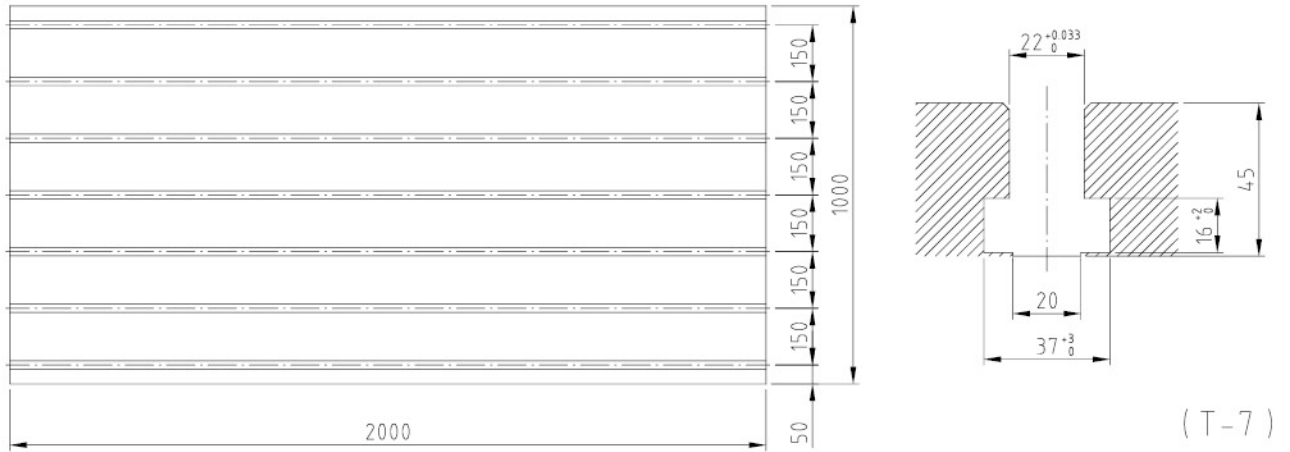


BLUM TC50

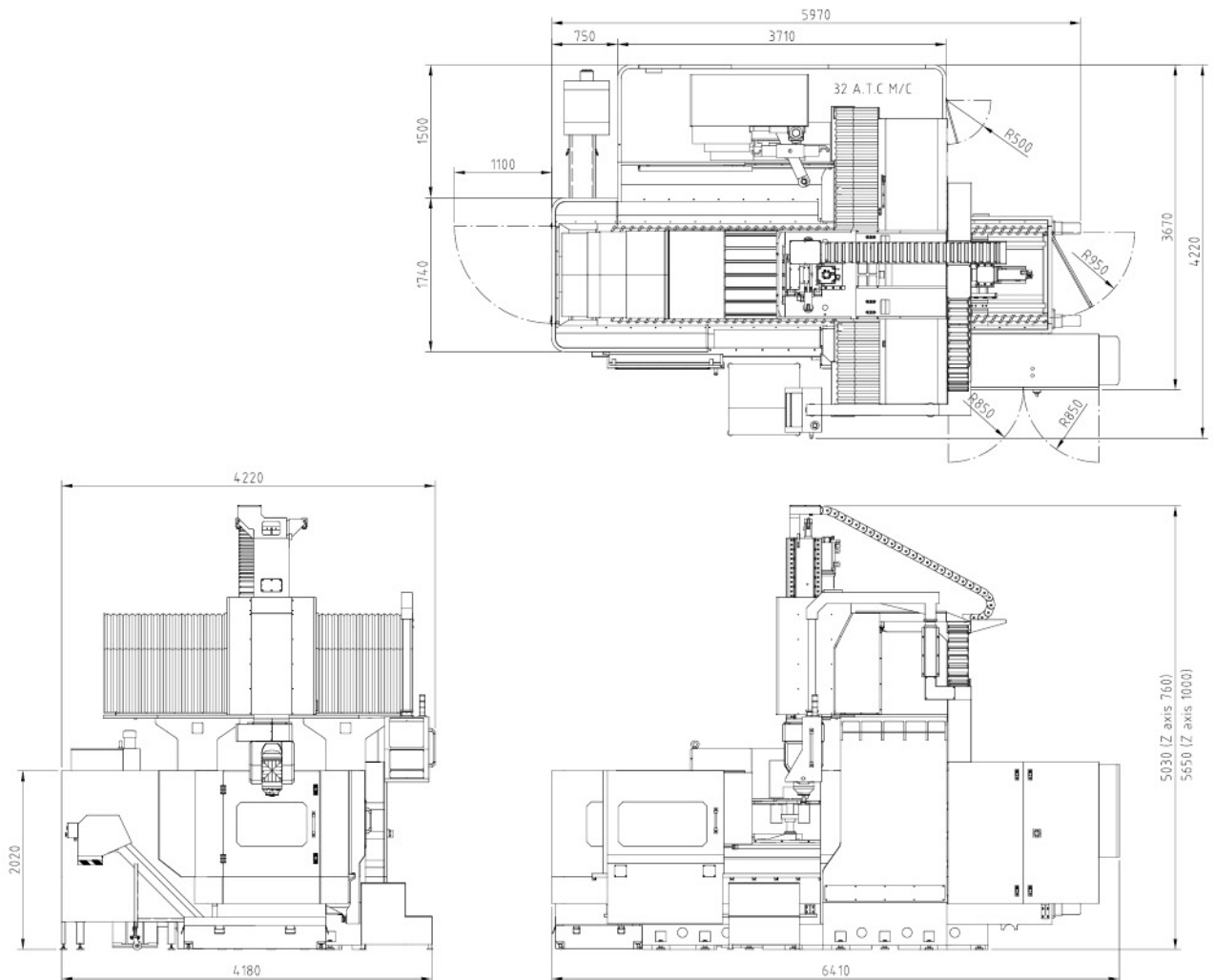


RENISHAW RMP60

## ● Size of working table (ex. S5A-2015H)



## ● Layout of machine (ex. S5A-2015H)



## CNC DOUBLE COLUMN 5 AXIS MACHINING CENTER

ITEM	MODEL	UNIT	S5A-2015H
X-AXIS TRAVEL		mm	2040
Y-AXIS TRAVEL		mm	1500
Z-AXIS TRAVEL		mm	760 ( 1000 )
ROTATING ANGLE ( C - AXES )		度	±275° speed 40°/S
TILTING ANGLE ( A - AXES )		度	95°/125° speed 41.67°/S
TABLE SIZE		mm	2000 x 1000
T-SLOTS DIMENSION		mm	22
TABLE LOAD CAPACITY		kgs	3500
DISTANCE BETWEEN TWO COLUMNS		mm	1200
DISTANCE FROM SPINDLE NOSE TO TABLE		mm	150 ~ 910 ( 150 ~ 1150 )
SPINDLE TAPER-TOOL SHANK		ISO NO.40 \ HSK-A63 ( HSK-A100 )	
SPINDLE SPEED RANGE ( HF )		rpm	3000 ~ 18000
MAIN MOTOR OUTPUT ( 30 MIN RATING/CONT )		Kw	S1 28Kw CONSTANT FROM 3000 rpm , TORQUE S1 89N-m UP to 3000 rpm
RAPID TRAVERSE RATE X,Y AXIS		mm/min	24000
RAPID TRAVERSE RATE Z AXIS		mm/min	20000
CUTTING FEED RATE		mm/min	15000
MINIMUM INPUT INCREMENT		mm/min	0.001
TOOL MAGAZINE CAPACITY		pcs	20 ( 32 / 40 )
MAX. TOOL DIAMETER / ADJACENT POCKETS EMPTY		mm	Ø80 / Ø125
MAX. TOOL LENGTH (FROM GAUGE LINE)		mm	250
MAX. TOOL WEIGHT		kgs	6.5
TOOL SELECTION METHOD		( ABS \ Random Bi )	
TOOL CHANGE TIME (T-T) (APPROX)		secs	4.5
POWER REQUIREMENT		Kva	50
FLOOR SPACE REQUIREMENT		mm	9100 x 5900
MACHINE HEIGHT FROM FLOOR LEVEL		mm	5210 / 5830
MACHINE WEIGHT (APPROX)		kgs	19000
CNC CONTROLLER		HEIDENHAIN \ SIEMENS \ FANUC series etc.	

### STANDARD ACCESSORIES:

1. LUBRICATION SYSTEM
2. GLAZED WINDOW-TYPE SPLASH GUARD
3. SCREW-TYPE CHIP CONVEYOR
4. LINK-TYPE CHIP CONVEYOR
5. COOLANT EQUIPMENT
6. SPINDLE OIL COOLER
7. Z-AXIS HYDRAULIC BALANCE UNIT
8. PNEUMATIC UNIT
9. AIR BLOW FOR CHIP ( BY M-CODE )
10. WORK LAMP
11. AUTO POWER-OFF
12. M.P.G
13. PROGRAM END&ALARM LAMP
14. RS-232 INTERFACE
15. LEVELING BLOCK AND BOLTS
16. TOOL KIT
17. MAINTENANCE AND OPERATION MANUAL
18. CONTROLLER OPERATION MANUAL AND ELECTRICAL CIRCUIT DIAGRAM
19. INSPECTION LIST

### OPTIONAL ACCESSORIES:

1. AUXILIARY TABLE
2. NC(ROTARY TABLE,INDEX TABLE)
3. 20 \ 32 \ 40 \ 60 \ ATC MAGAZINE CAPACITY
4. TOOL PRESETTER
5. AUTO TOOL LENGTH DIAMETER MEASUREMENT
6. AUTO TOUCH PROBE SYSTEM
7. LINEAR SCALE FEEDBACK
8. COOLANT THROUGH SPINDLE SYSTEM
9. COOLANT AUTO AIR MIST DEVICE
10. SPINDLE THERMAL COMPENSATION
11. AVAILABLE WITH DIFFERENT SPINDLE SPEC & RPM
12. MANUAL FULL SPLASH GUARD

NOTE: 1.( ) Description is optional accessories.

2.To research and improve our company keep the right of changing design and structure at any time, this data is just for reference.

3.Custom-machines are available.



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