

Horizontal Machining Center

HB-800II



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HB-800II



High efficiency machining

Human-machine interface is applied on HB-800II through excellent industrial machine design. Significant non-machining time is saved for high production efficiency.

High torque powerful spindle

10,000 rpm built-in spindle (standard) is with 25/30 kw motor power and ceramic bearings, that gives high torque performance up to 420 Nm. The spindle is suitable for aluminum alloy, cast iron and steel machining. Alternative option, spindle with gear box, has 1461 Nm powerful torque for cast iron, forging, and tough materials. HB-800II is widely used in automobile industries, construction equipment, agriculture machinery and general-purpose machining.

Main Specifications

Spindle	10,000 rpm Build-in spindle
	6,000 rpm High torque spindle with gearbox
Three axes	Rapid traverse 50 m/min
	X/Y/Z axis travel 1,400/1,200/1,300 mm
	X/Y/Z axis acceleration/deceleration 0.4/0.6/0.4 G
	X/Y/Z axis LM □65/□55/□55 mm
	High rigidity roller guide way
	X/Y/Z High precision ballscrew Ø50 mm
B axis rotary table	Three axes linear scale (Optional)
	Gear coupling type 1° rotary table
ATC	NC 0.001° rotary table (Optional)
	Separable type tool pots
	High speed cam type tool changing device

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Machining capability / Machining accuracy

Trial cut data with 10,000 rpm Built-in spindle

End mill Ø30mm		
Material	S45C	FCD25
Depth/Width	30/15 mm	30/15 mm
Spindle speed	424 rpm	480 rpm
Feed rate	255 mm/min	360 mm/min
Chip removal rate	114 cm³/min	143 cm³/min



Face mill Ø125mm		
Material	S45C	FCD25
Depth/Width	4/100 mm	7/100 mm
Spindle speed	586 rpm	586 rpm
Feed rate	880 mm/min	880 mm/min
Chip removal rate	351 cm³/min	615 cm³/min



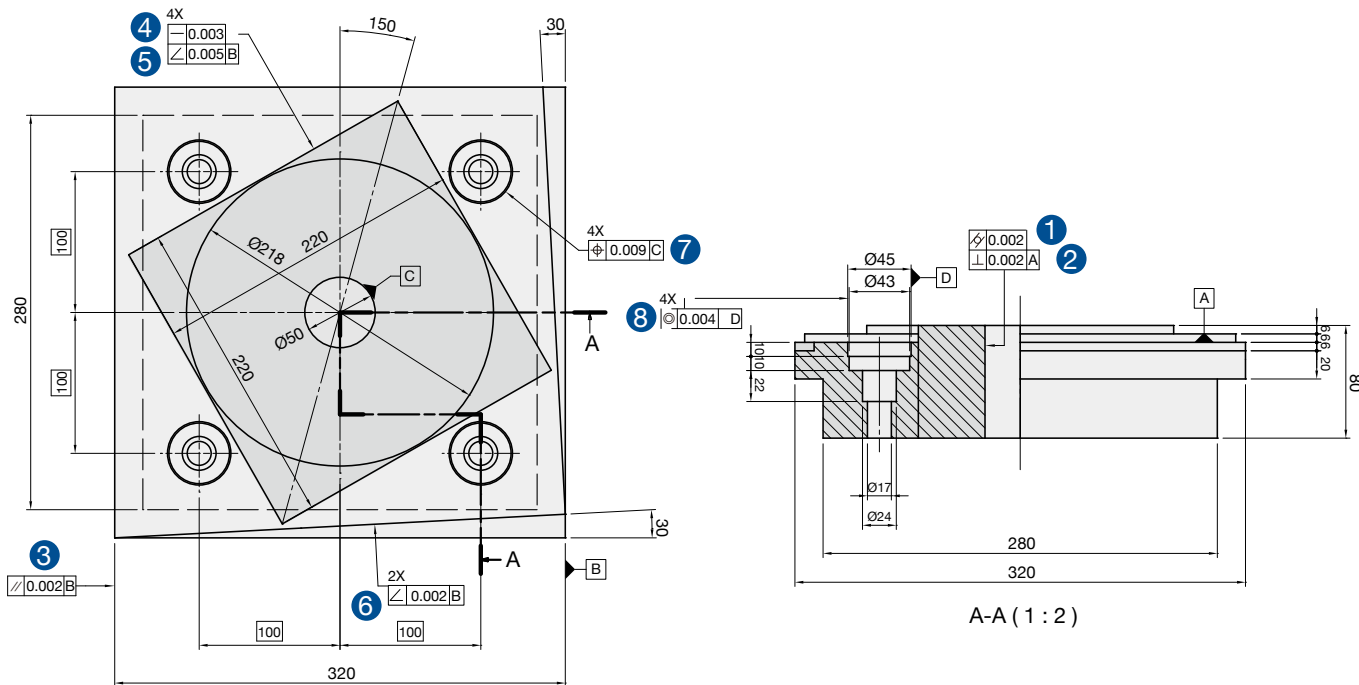
Machining accuracy

Linear scale (Optional)

Linear scale is able to compensate the positioning error, repeatability error, and ball screw pitch error, which are caused by the temperature changing. The positioning accuracy achieves $\pm 3 \mu\text{m}$ with compensation of linear scales.



HB-800II Accuracy performance



Three axes accuracy

Test standard : ISO10791-7
Material : A6061

Unit : mm

Test items	Test accuracy
① Cylindricity	0.002
② Perpendicularity	0.002
③ Parallelism	0.002
④ Straightness	0.003
⑤ Angular accuracy	0.005
⑥ Angular accuracy	0.002
⑦ Position accuracy	0.009
⑧ Concentricity	0.004

Test standard : VDI3441

Unit : μm

	Positioning accuracy	Repeatability accuracy
X axis	7	3
Y axis	7	3
Z axis	7	3
	Positioning accuracy with linear scale	Repeatability accuracy with linear scale
X axis	5	2
Y axis	5	2
Z axis	5	2

Main structure

High rigidity structure

Travel

X/Y/Z axis 1,400/1,200/1,250 mm

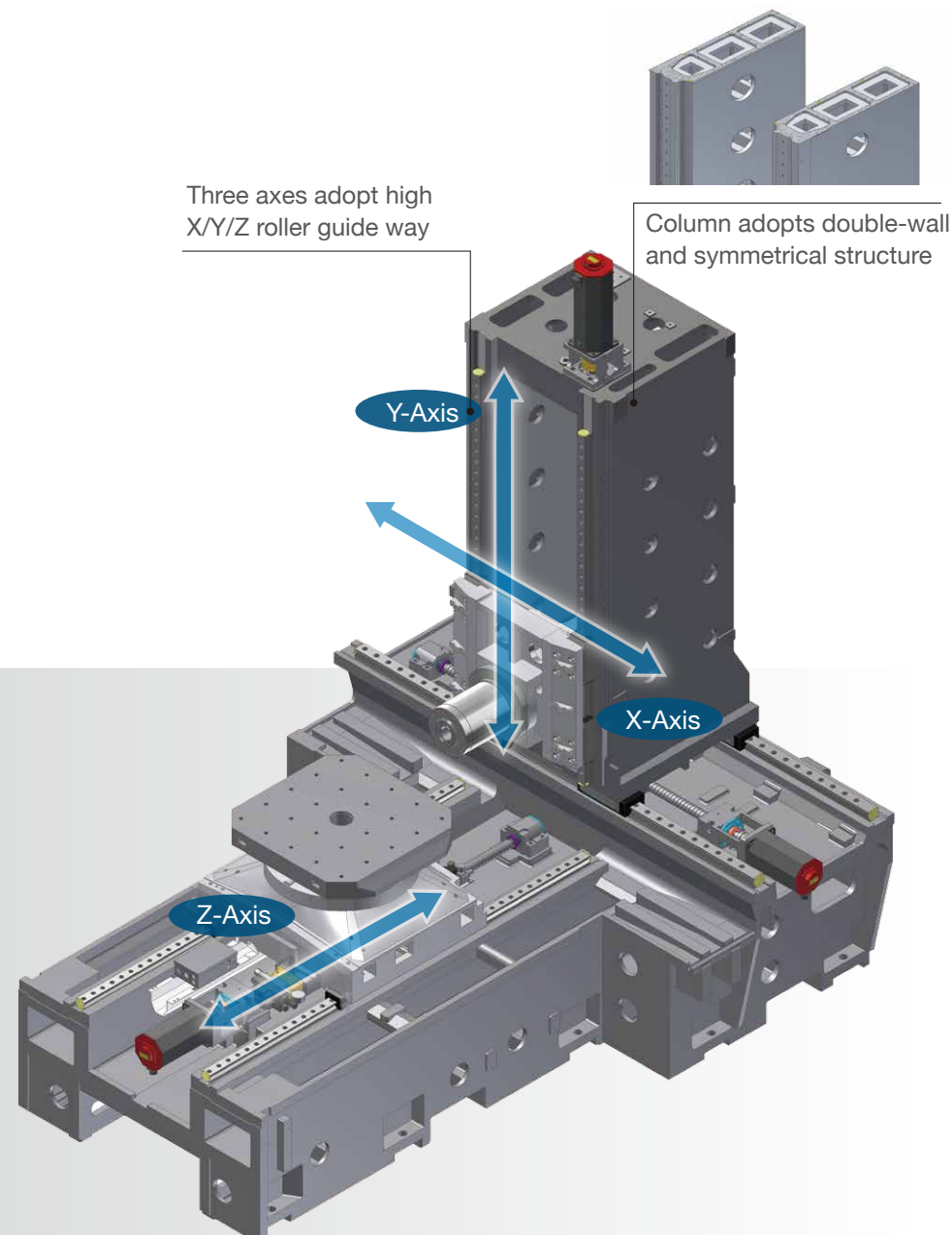
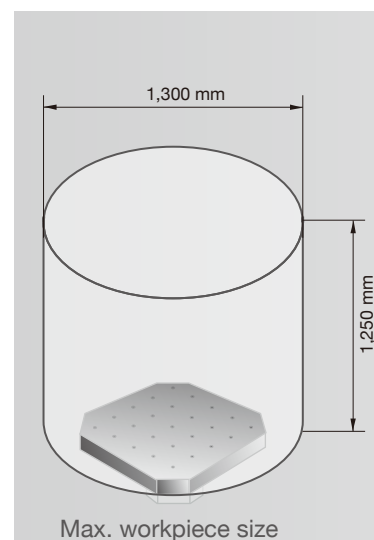
Rapid traverse

X/Y/Z axis 50 m/min

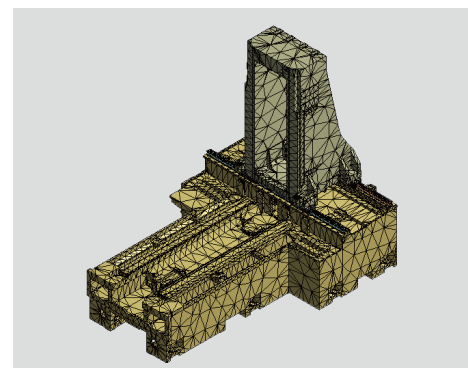
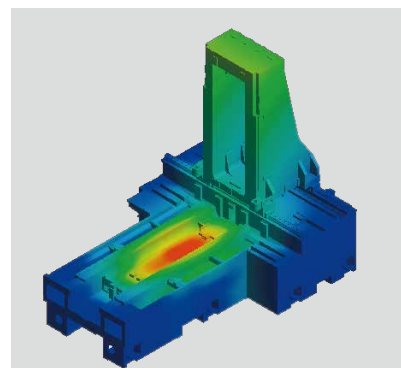
Acceleration/deceleration

X/Y/Z axis 0.4/0.6/0.4 G

Working area



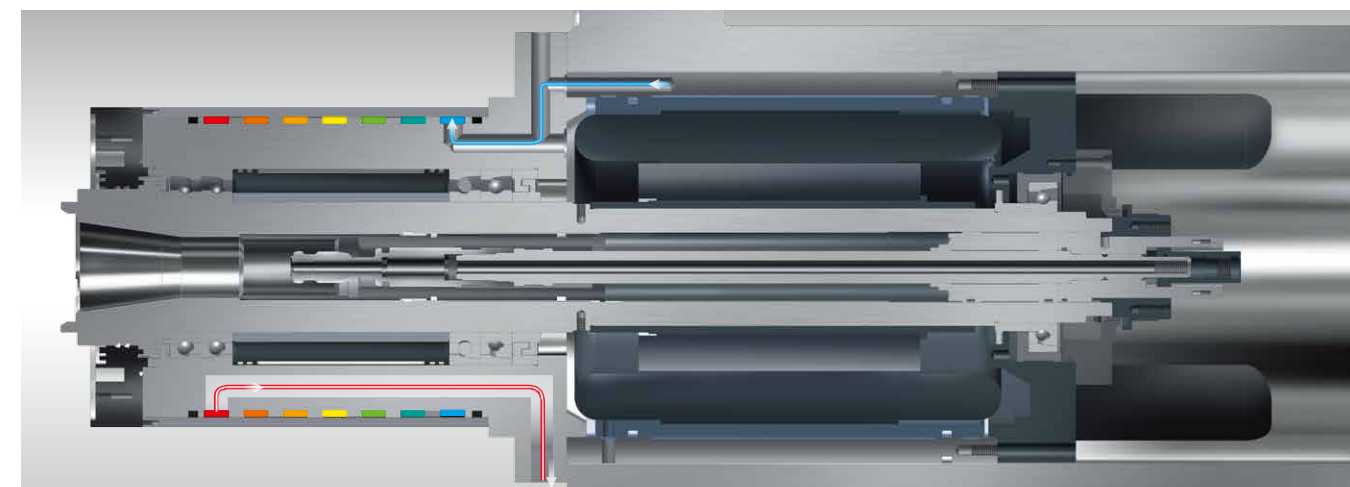
Through the finite element analysis (FEA), structure design enables to keep high rigidity and stability in high speed motion. T-shape bed and strong column transfer and absorb vibrations to maintain excellent face machining.



Spindle

Standard spindle

Ø100 mm ceramic bearings are adopted in 10,000 rpm high torque built-in spindle. Cooling fluid circulation outside of spindle cartridge to maintain bearing temperature. Also, compressed air is led into motor chamber to cool motor. 420 Nm torque given by 500 rpm is suitable for heavy duty machining, like cast iron and forging materials.

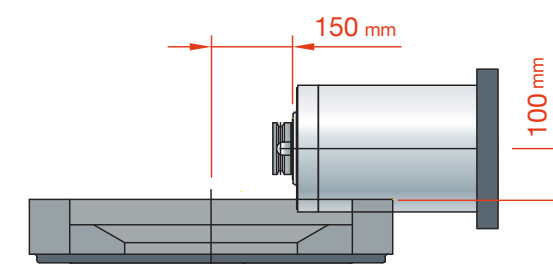


Max. speed 10,000 rpm

Spindle motor 30/25 kW

Output torque 420/350/238 Nm
(25%ED/10 min./Cont.)

Acceleration time 2.5 sec (0→10,000 rpm)
1.1 sec (0→4,000 rpm)



Min. distance from spindle nose to table center 150 mm
Min. distance from spindle center to table surface 100 mm

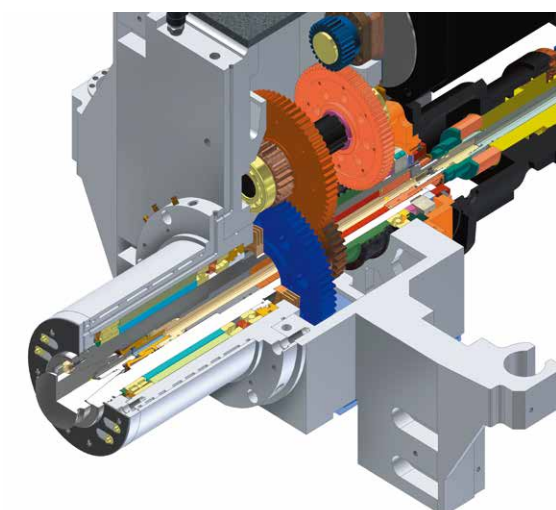
High torque spindle with gear box

High precision gears are used in spindle to supply high transmission efficiency. The two step gear box can generates more than 1,400 Nm torque at 200 rpm, it is specially suitable for hard materials and heavy duty works.

Max. speed 6,000 rpm

Spindle motor 22/18.5 kW

Output torque 1,050/883 Nm
(30 min. S3, 60%/Cont.)



Main structure

B axis rotary table

High precision positioning cones with hydraulic locking design, generating 18 tons of clamping force to ensure the table stability during machining.



Max. table load	1,800 kg×2
90° indexing time of 1° rotary table (Std.)	2.4 sec
90°indexing time of 0.001° rotary table (Opt.)	1.6 sec
Pallet clamping force	18,000 kgf
Braking torque	528 kg-m

APC

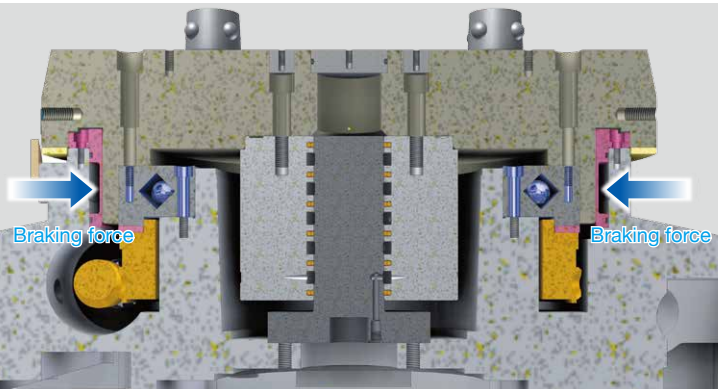
APC dynamic rigidity is strengthened by new hydraulic driven design and optimized PLC setting, APC indexing time is significantly reduced with max. loading condition.

Pallet changing time	
17 sec	21 sec (Previous model)



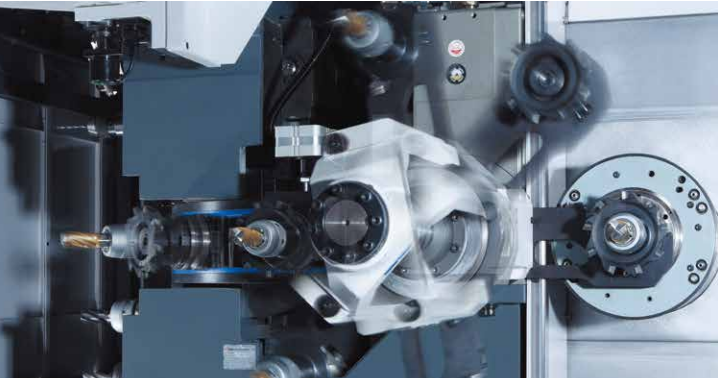
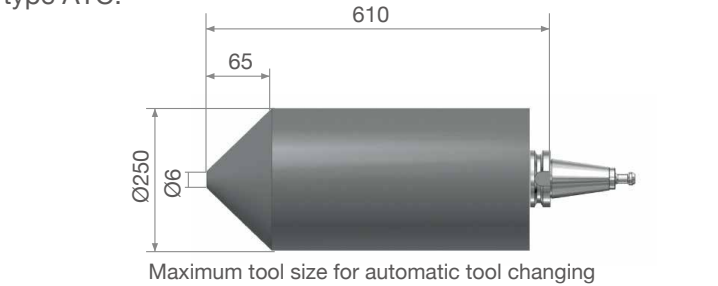
Full-circle hydraulic braking system (NC 0.001° index table)

HB series adopts a full-circle hydraulic braking system. The full-circle surface is synchronously locked by hydraulic force. Clamping on large full-circle face, B axis has good rigidity and durability for heavy duty machining.



ATC

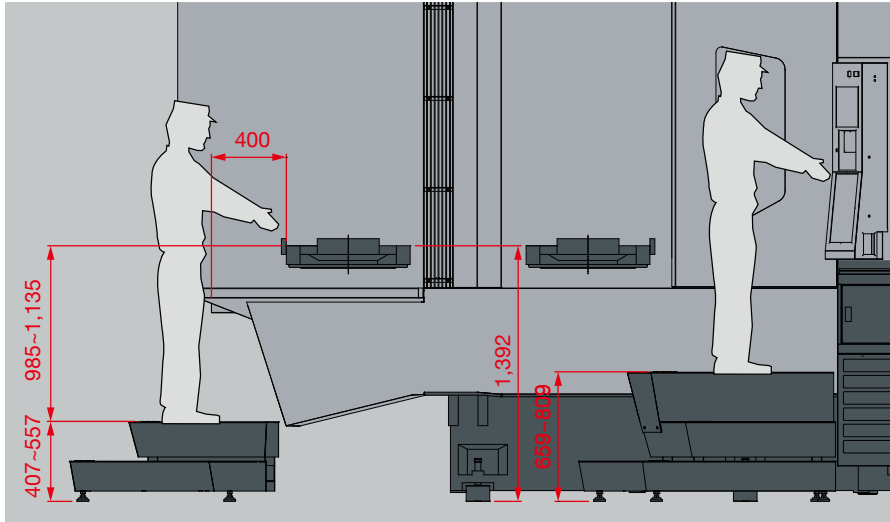
Automatic tool changer : Equipped with Japanese made cam type ATC.



T to T	2.4 sec
C to C	4.5 sec
Tool capacity	60 pc (Std.) 90/120 pc (Opt.)

Operation

The step up platform are provided at front side machine and operating panel side for operation assisatance.



Unit : mm

With transparent window and wide tool magazine door design, friendly operating distance and height is convenient for operators.



Air FRL unit and lubricant unit are centralized together for daily maintenance easily.



Spacious area facilitates loading, unloading and jig & fixture operations.

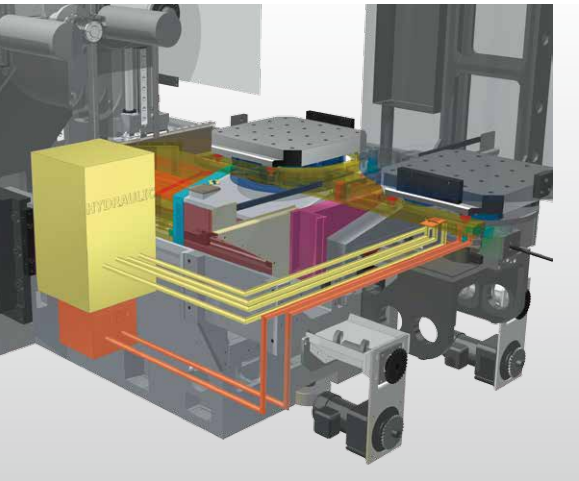
Peripheral accessories

Hydraulic and pneumatic supply for jig & fixture (Opt.)

1. Suspended arm type supply
Totally 6 ports are provided on each side and the maximum hydraulic pressure allowed is 250 bar.

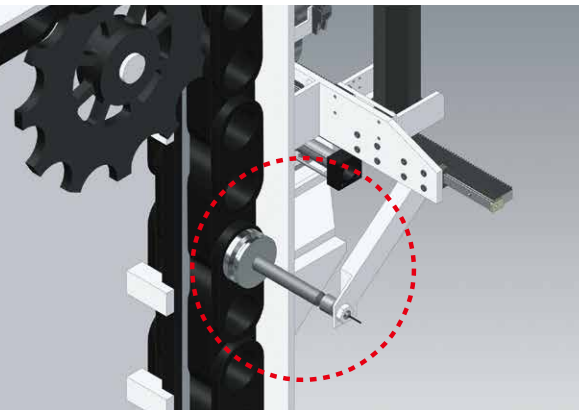


2. Hydraulic supply under pallet
Quick couplers are used for hydraulic supply under pallet. There is no limitation for B axis rotating.



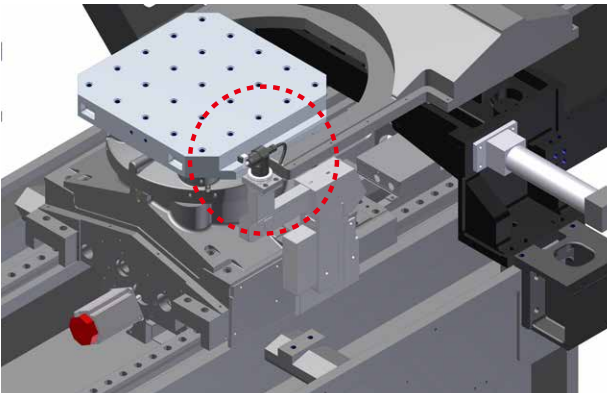
Tool magazine side tool breakage detector (Opt.)

Tool breakage condition can be detected on standby tool for saving cycle time.



Interior tool measuring device (Opt.)

Tool length and diameter can be measured by this function, it is well installed at working table side to avoid interference of tool and work piece.



Rearward type chip conveyor (Std.)

According to different materials and chip size, Tongtai provides various chip conveyors for the best chip disposal.

○ : Suitable × : Non-suitable

	Steel		Cast iron		Aluminum/Non-ferrous metal		
Specification	Long/ Curl chips	Short chips	Powder chips	Short chips	Long/ Curl chips	Short chips	Powder chips
Hinge type	○	×	×	×	○	×	×
Scraper type	×	○	○	○	×	○	○
Magnetic scraper type	×	○	○	○	×	×	×
Drum type	×	○	○	○	×	○	○
Integrated type	○	○	○	○	○	○	○

Short chips : Chips shorter than 60 mm or ball type chips smaller than Ø40 mm.
Curl long chips : Chips' length is longer than short ones.

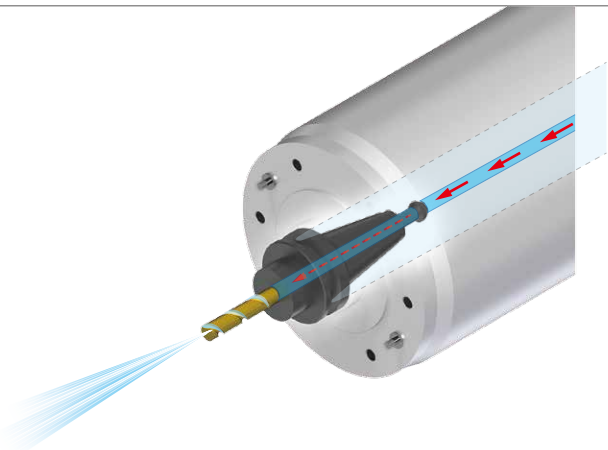


Coolant tank capacity
800 L(80% full)

Coolant Through Spindle

C.T.S. increases the efficiency of chip flow and extends the tool life by cooling the cutting point.

Discharge pressure : 20/40/70 bar
(2.0/4.05/7.0 MPa)
Filtering accuracy : 40 μm

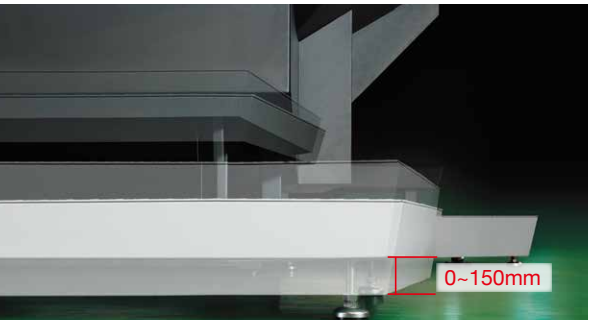


Shower coolant system (Std.)



Shower coolant continuously flush out chips during machining to save time of cleaning.

Assisted stair (Std.)



The assisted stairs on loading / unloading side and operating panel side platforms are adjustable according to operator's stature. This friendly design makes operators more comfortable.

TIMS Tongtai Intelligence Manufacturing System

Considering productivity improvement, better machining precision, operating facilitation, as well as protection and maintenance assistance, TIMS includes four management functions: production management, intelligent monitoring, tool management, and workpiece management. These provide customers a comprehensive intelligence manufacturing system and a friendly human-machine interface.

Production management

- Cutting Load Monitoring**
The spindle and feeding axis motor loads are able to be monitored from the operation panel directly. The tool number is also shown during machining.
- APC Information**
The operator is able to assign the program codes of A/B pallet in the operating interface directly and the system will call the corresponding programs of workpiece automatically.
- Machine Alarm Messages Record**
Alarm messages will be recorded in detail during machine processing.
- Troubleshooting and Maintenance Support**
Graphical display interface assists operators to understand detail alert and warning information.



Tool management

- Tool Usage Time Tracking**
Record the information of last machining date, time, and accumulated machining time in each tool.
- Tool Compensation**
When the machining process needs tool length compensation, the operator is able to key in the compensation data for the tools.
- Tool Life Management**
Display the tool life information and reminds the operator to check workpiece before tool life almost approaching its maximum.
- Tool Overload Protection**
Display the information tool loads, spindle loads, machining time, abnormal data, and overload value of tools. When overload value reached, system will shut down the machine and show the alarm message.



Intelligent monitoring

- Motor Load Monitoring**
Monitoring and retrieving the motor load data during machining from the operation panel. In addition, according to the setting values, the system will show the alarm messages or shut down the machine.
- Machining Adaptive Control**
Monitoring the spindle loads and the system enables automatic feeding adjustment to protect tools and ensure machining efficiency.
- Crush Protection**
With the real-time detection of servo loads during feeding, the electrical brake is activated when a crash happens to minimize the damage.



Workpiece management

- Workpiece positioning**
The CCD camera is used to monitor the characteristics of workpiece, and then the system will calculate and compensate program coordinates for increasing machining precision.



Flexible Manufacturing System (FMS)

Flexible Manufacturing System (FMS) means a reasonable, flexible and versatile machining system including machine itself, auto moving system, and software which can integrate both. Main application is suitable for products of low volume and high variety, in detail will include the machining unit, storage unit, logistic handling unit, accessory unit and control unit. First four units are hardware of flexible manufacturing system. The control unit will integrate each hardware, control the info flow between each unit and make the whole system flexible, reasonable and compactable.

Container

It allows temporary storage of machined parts and finished goods. The basic storage capacity is 10 sets and possible to expand to 20 sets maximum.

Stacker Crane

It assists workpiece movement from storage area to loading area, loading area to machining station, or between the stations.



Loading/unloading station

Raw material and finished workpiece can be loaded and unloaded at this station. One loading/unloading station is standard and the second one is available.

Manufacturing Management System, MMS

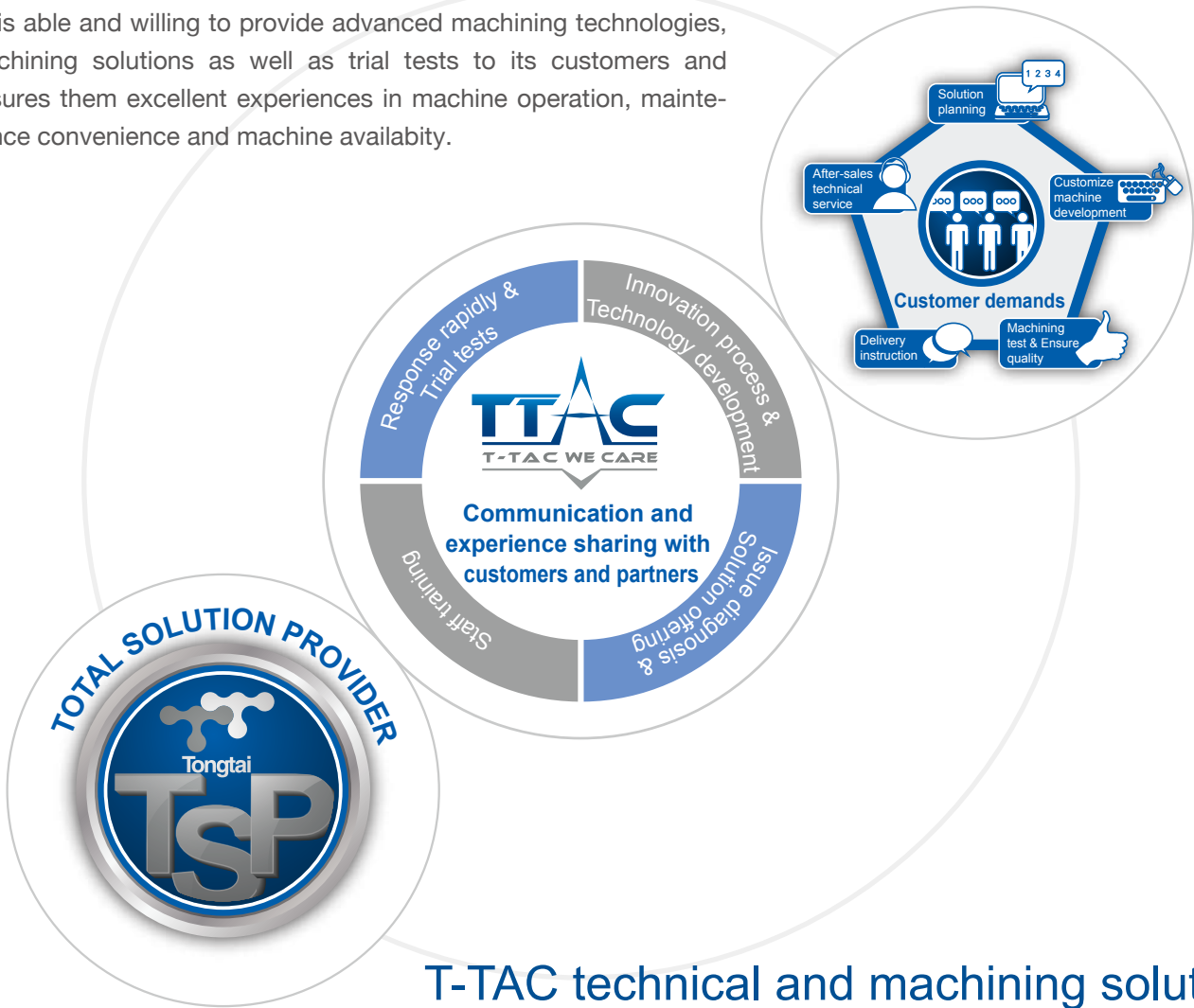
All control information of FMS can be set in this system. Moreover, it can combine with a monitoring module for collecting the production information and feedback.

- Based on following four conditions to decide the priority of handling sequence, “first in first out”, “optimization route”, “machine intelligence judgments” and “manual priority sequence adjust”.
- Operator can control the raw material input, adjust priority sequence, and check workpiece history record.
- When one single machine is down, other machine can still work properly.

Item	Specification	
Workpiece storage system	Number of stacker cranes	1
	Max. loading capacity of stacker crane(kg)	1,000
	Number of containers	1(2)
	Storage number of pallet	10 (20)
	Number of loading/unloading station	1 (2)
MMS	Minimum limited machining time	4.5(10)
	CC1 control system	1
	MMS-5000(Machine status monitoring)	option
	MMS-5100(Remote monitoring service)	option
Number of machine	1 (2)	

Tongtai- Technical Application Center

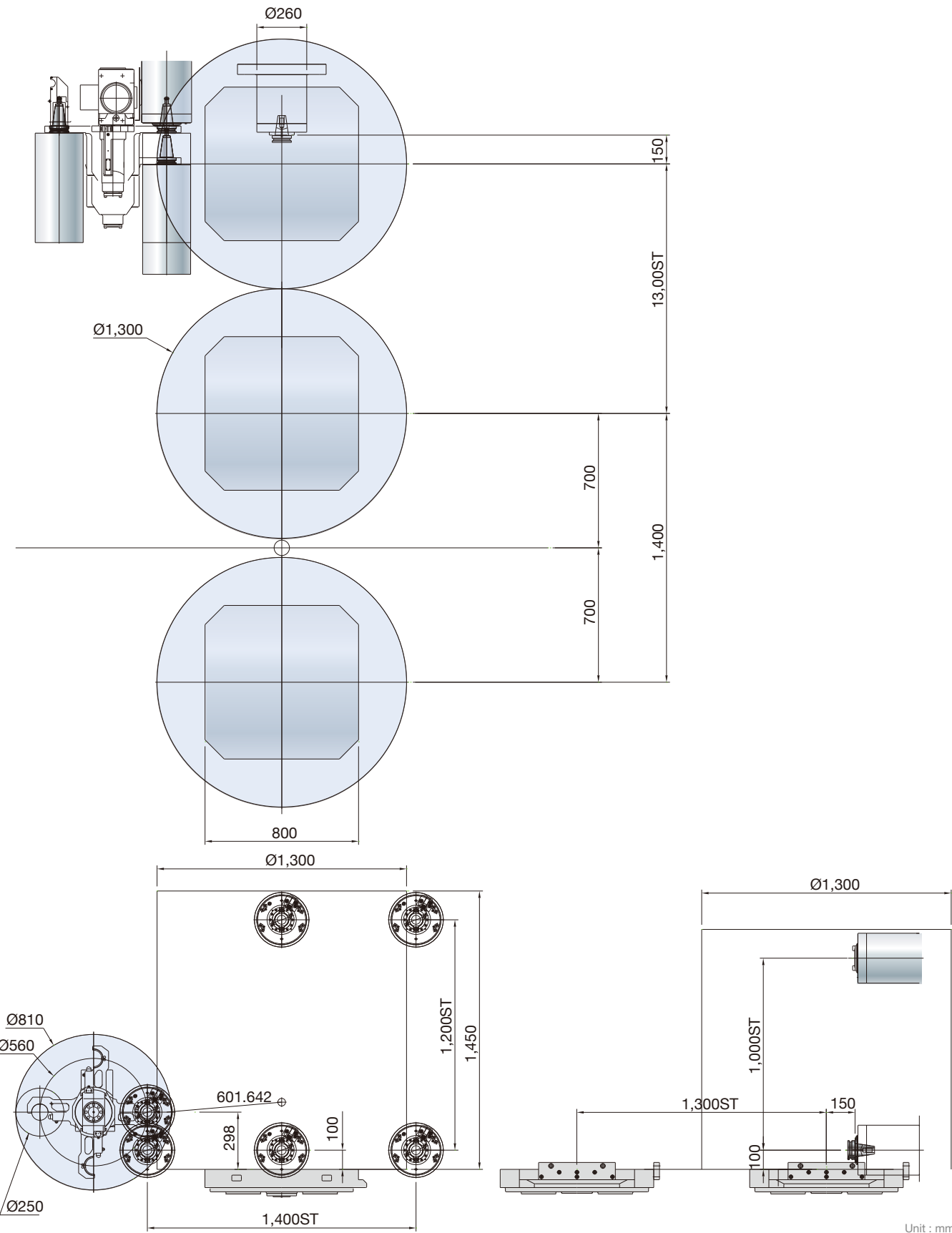
The purpose of T-TAC is to take care of customer’s machining solution actively. Based on the outstanding technical applications, Tongtai is able and willing to provide advanced machining technologies, machining solutions as well as trial tests to its customers and ensures them excellent experiences in machine operation, maintenance convenience and machine availability.



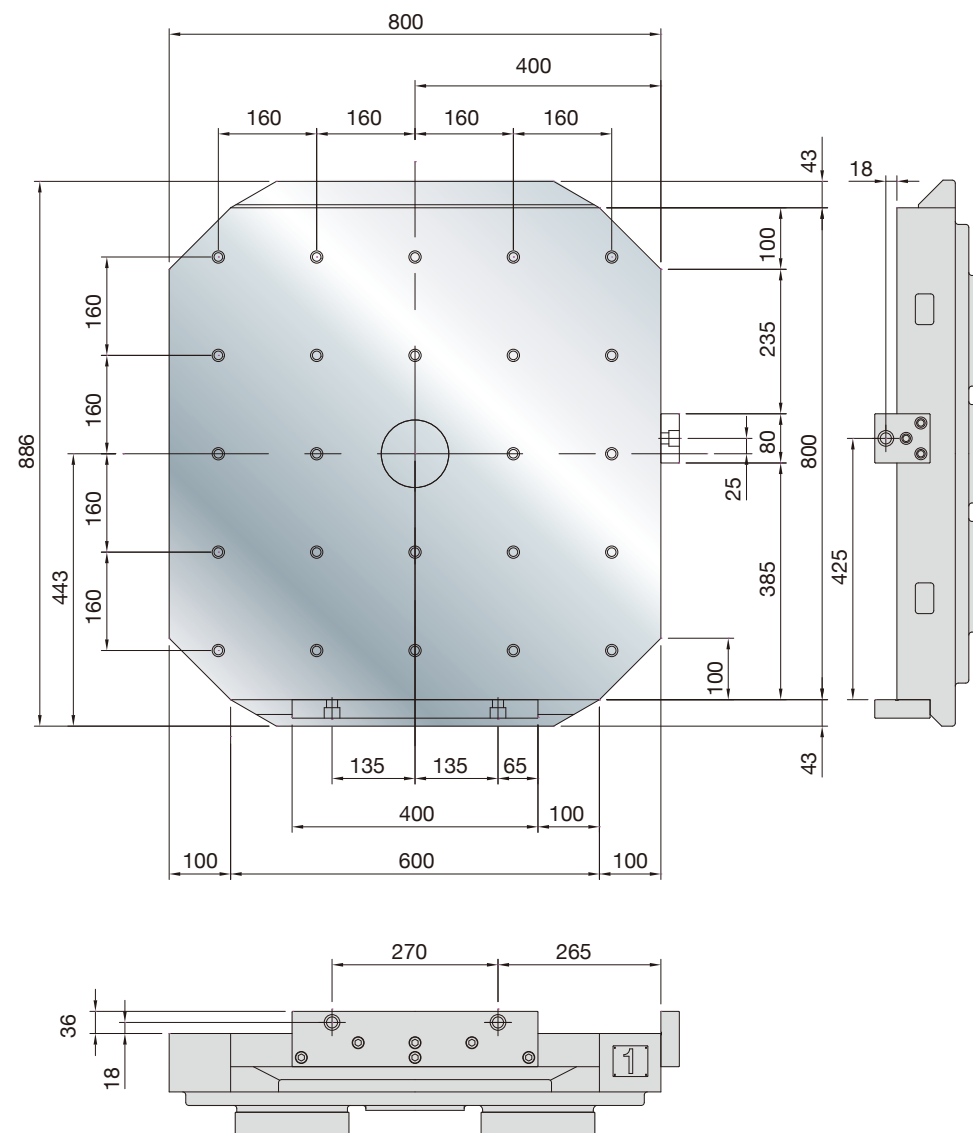
T-TAC technical and machining solutions

Solutions	Contents
Product manufacture test	Through the manufacturing progress and jig & fixture plans, Tongtai's skilled staff will manufacture the first piece for understanding the client's corresponding demands.
Machining technologies	By introducing innovative technologies and adding the extra functions, T-TAC is available to provide the brand-new solutions.
Machine technology	Our technical staff will test current problems, which clients have, in the same machine model for processing problem diagnosis and providing possible solutions. Furthermore, our skilled staff is able to provide the services at the client's factory.
Training	T-TAC is open to train current clients, potential customers, agents, teachers/students, and employees and to strengthen their abilities.
Technology exhibits	T-TAC is also an excellent platform to launch new products/technologies by cooperation with software/hardware suppliers. With presentation of highly reliable products/technologies, it's possible to provide higher efficiency and availability solutions than existing ones.

Interference diagram

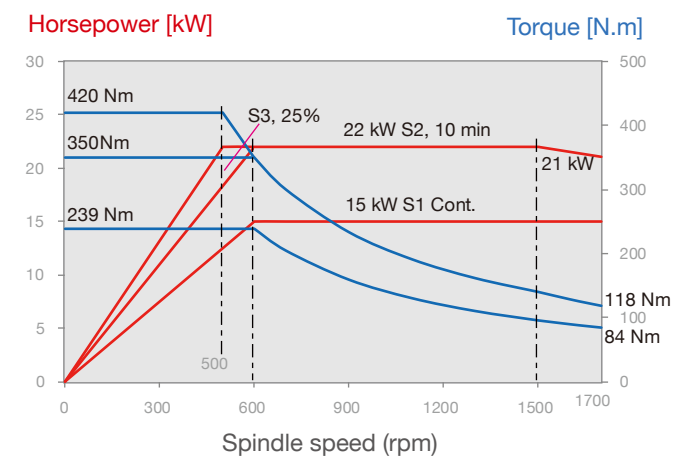


Pallet

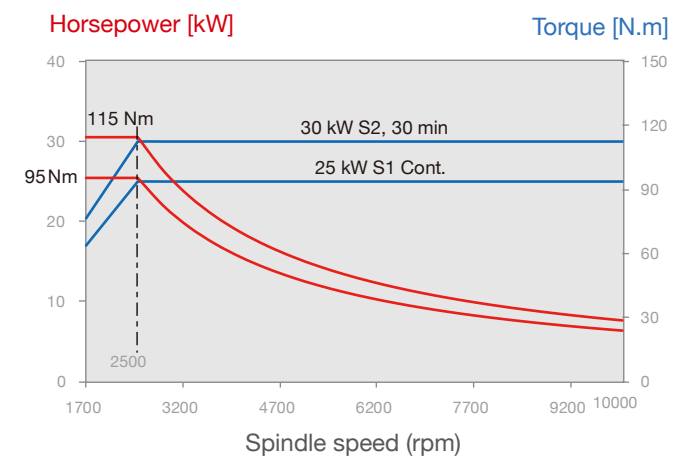


Spindle output and torque chart

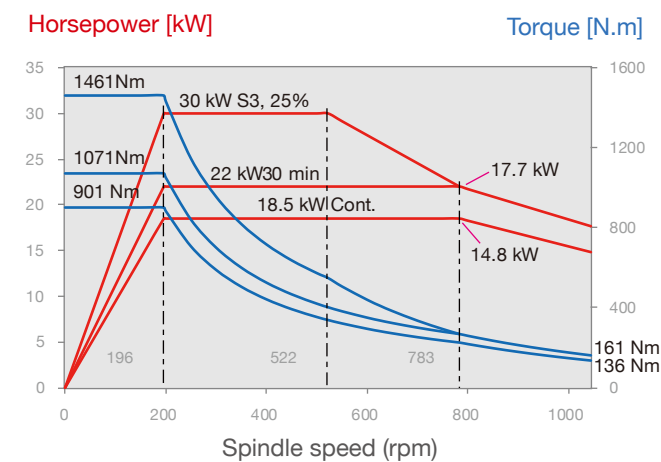
10,000 rpm Build-in spindle
(Low-winding)



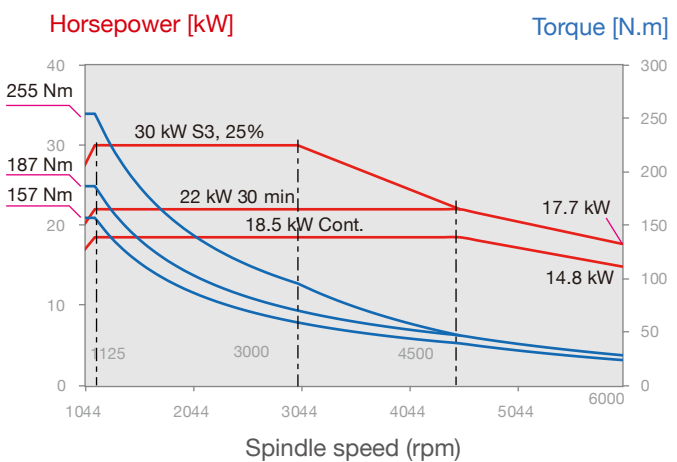
(High-winding)



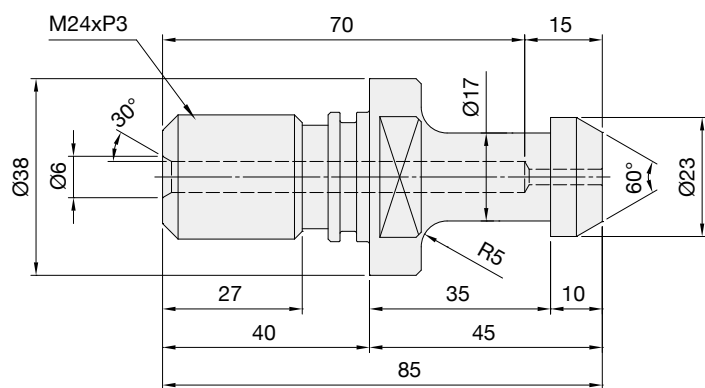
6,000 rpm High torque spindle with gearbox
(Low-winding) (H



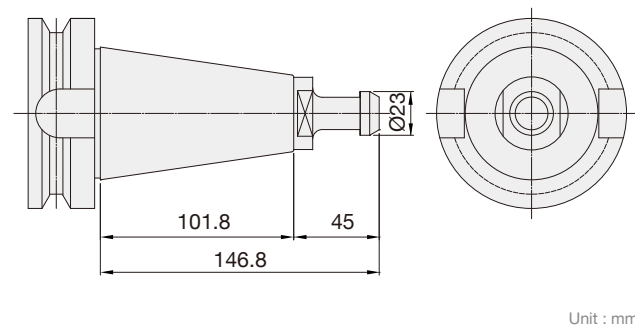
(High-winding)



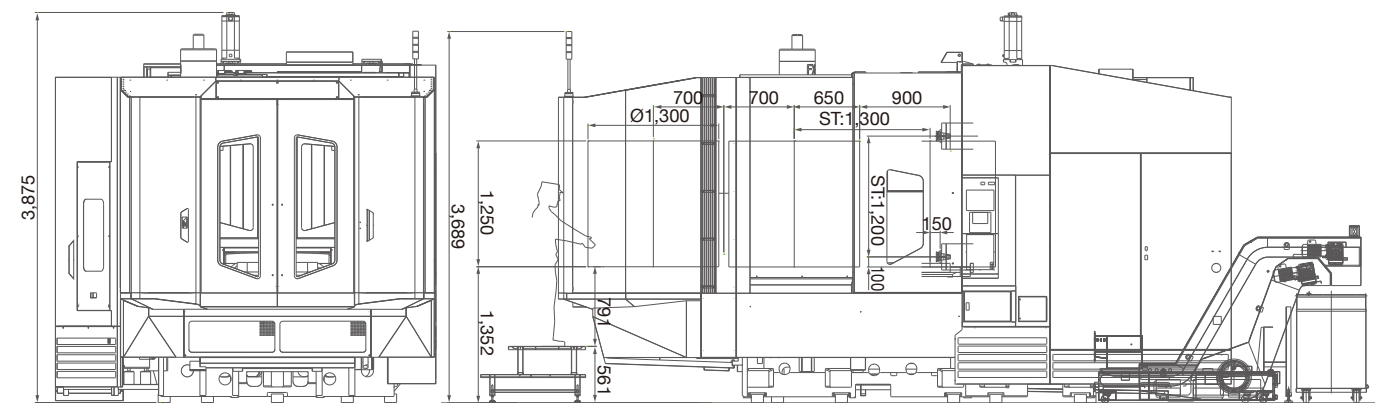
Pull stud (coolant through spindle A type)



Tool shank MAS BT50



Machine dimensions



Standard/optional accessories

		Standard	Optional
Spindle	10,000 rpm Build-in spindle	●	
	6,000 rpm High torque spindle with gearbox		○
B axis	Hirth coupling 1° rotary table	●	
	NC 0.001° index table (Rotary encolder in B axis is available)		○
Tool shank	BT50	●	
	HSK-A100		○
	DIN50		○
	CAT50		○
Angle of BT50 pull stud	MAS407 BTIII(90°)	●	
	MAS407 BTII(60°)		○
	MAS407 BTI(45°)		○
Coolant through spindle pump	20 bar	●	
	35 bar		○
	70 bar		○
Tool capacity	60 pc	●	
	90 pc		○
	120 pc		○
Cooling system	Spindle cooling system	●	
	Hydraulic temperature control system		○
	Coolant temperature control system		○
	Air conditioner for electrical cabinet		○
Automatic pallet changer	Two pallets	●	
	8PPL system		○
	FMS (flexible manufacture system)		○
Interior chip disposal	Two chip augers	●	
Chip conveyer	Scraper type conveyor	●	
	Magnetic scraper type conveyor		○
	Hinge type conveyor		○
	Drum type conveyor		○
	Integrated type conveyor		○
Lubrication system	General lubricant system	●	
	LHL integrated lubrication system		○
Three axes linear scale	5 μm resolution		○
	3 μm resolution		○
Jig & fixture hydraulic/ pneumatic supply	Suspended arm type supply, 6 holes on each side (Maximum hydraulic pressure 250 bar)		○
	Table type, 6 holes on APC side (Maximum hydraulic pressure 250 bar)		○
Tool measuring system	Tool breakage detector (Installed on tool magazine side to detect tool breakage)		○
	Renishaw TS-27R touch sensor (Installed in the interior of the machine for measuring tool length, tool breakage and tool diameter)		○
Controller	FANUC 31i-M	●	
	FANUC 0i-M		○
Other accessories	Workpiece measuring system		○
	Machining air blow		○
	Air gun		○
	Coolant gun		○
	Oil skimmer		○
	Oil mist collector		○

Specifications

Item	Specification	Unit	HB-800II
Travel	X axis	mm	1,400
	Y axis	mm	1,200
	Z axis	mm	1,300
	Spindle nose to table center	mm	150-1,450
	Spindle center to table surface	mm	100-1,300
	Table height from floor	mm	1,392
Pallet	Pallet size	mm	800×800
	Max. load	kg	1,800×2
	Pallet face		M16×24 holes
	Min. Indexing increment	degree	1 (Opt. 0.001°)
Spindle	Spindle speed	rpm	10,000
	Spindle shift	step	Two steps by electric
	Spindle taper		7/24 Taper No.50
	Bearing diameter	mm	Ø100
Feed	Rapid traverse	m/min	50
	Cutting feedrate	mm/min	1-20,000
ATC	Tool shank		BT50
	Pull stud	degree	90(MAS-P50T)
	Tool capacity	pc	60
	Max. tool diameter	mm	Ø125
	Max. tool diameter (w/o adjacent tool)	mm	Ø250
	Max. tool length	mm	610
	Max. tool weight	kg	25
	Tool selection system		Fixed type
APC	Number of pallets		2
	Pallet changing system		Rotary type
Required electricity	Required electricity	kva	60
	Required voltage	v	200-220 ±10%
	Current frequency	hz	50 or 60 ±1%
	Pneumatic source	mpa	0.5
	Air supply	liter/min	400
Capacity	Hydraulic tank	liter	30
	Lubricant tank	liter	2
	Coolant tank	liter	800
Machine size	Width x Depth x Height	mm	4,535 x 8,803 x 3,875
	Weight	kg	22,000

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