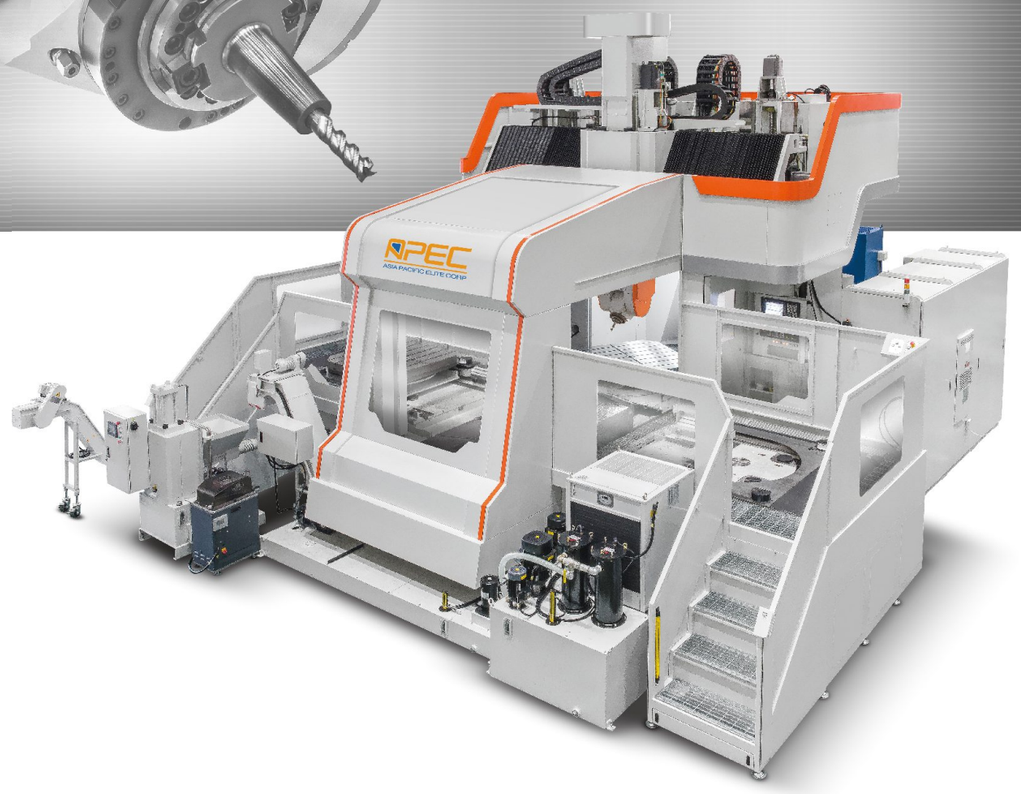
APEC
ASIA PACIFIC ELITE CORP

MDU
MDU-W series

Heavy Duty 5-axis Machining Center

- Aircraft gas turbine engine casing
- Hydraulic turbine impeller & propeller
- 1000Nm High torque machining capacity
- Spindle head with box-way design



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Asia Pacific Elite Corp.

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TONGTAI GROUP

2016.05.1000

APEC Wide ranges of large-scale machining centers

G Series
X=2~12 m Y=2.0~3.0 m
Rapid traverse=60 m/min

GF Series
X=6.0~30.0 m Y=4.0~5.0 m
Rapid traverse=40 m/min

GM Series
X=4.0~6.0 m Y=2.7~3.7 m
Rapid traverse=60 m/min

MT Series
X=3.2~6.2 m Y=1.5~3.4 m
Rapid traverse=12~20 m/min

MDU Series
X=2.0~2.5 m Y=2.0~2.5 m
Rapid traverse=10 m/min

Auto attachment heads

5 face machining

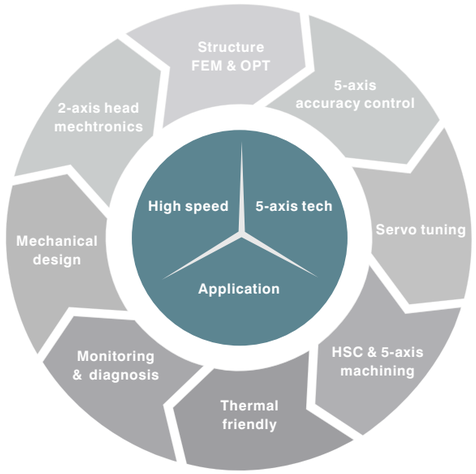
Heavy duty 5 face machining

5 axis continuous machining

5 axis heads

About Asia Pacific Elite Corp.

Creating benchmarks of large-scale 5-axis expert for high speed gantry machining center



Excellent products and services

APEC Ltd. affiliated with the TTG (Tongtai Group) which is the biggest machine tool building group in Taiwan, is the first company working on manufacturing the large gantry High-speed 5-axis machine in Asia area. To provide the most professional and complete products and service, we adopt the European main components design and manufacturing technology, designed for gantry type and high-end processing.

Since 2003 . we have been successfully selling our products in wide range of industry of automotive and aerospace ,and we also win the repeat orders in the Well-known enterprises all over the world and continue to build the excellent reputation.

Perfect application supporting and customer training

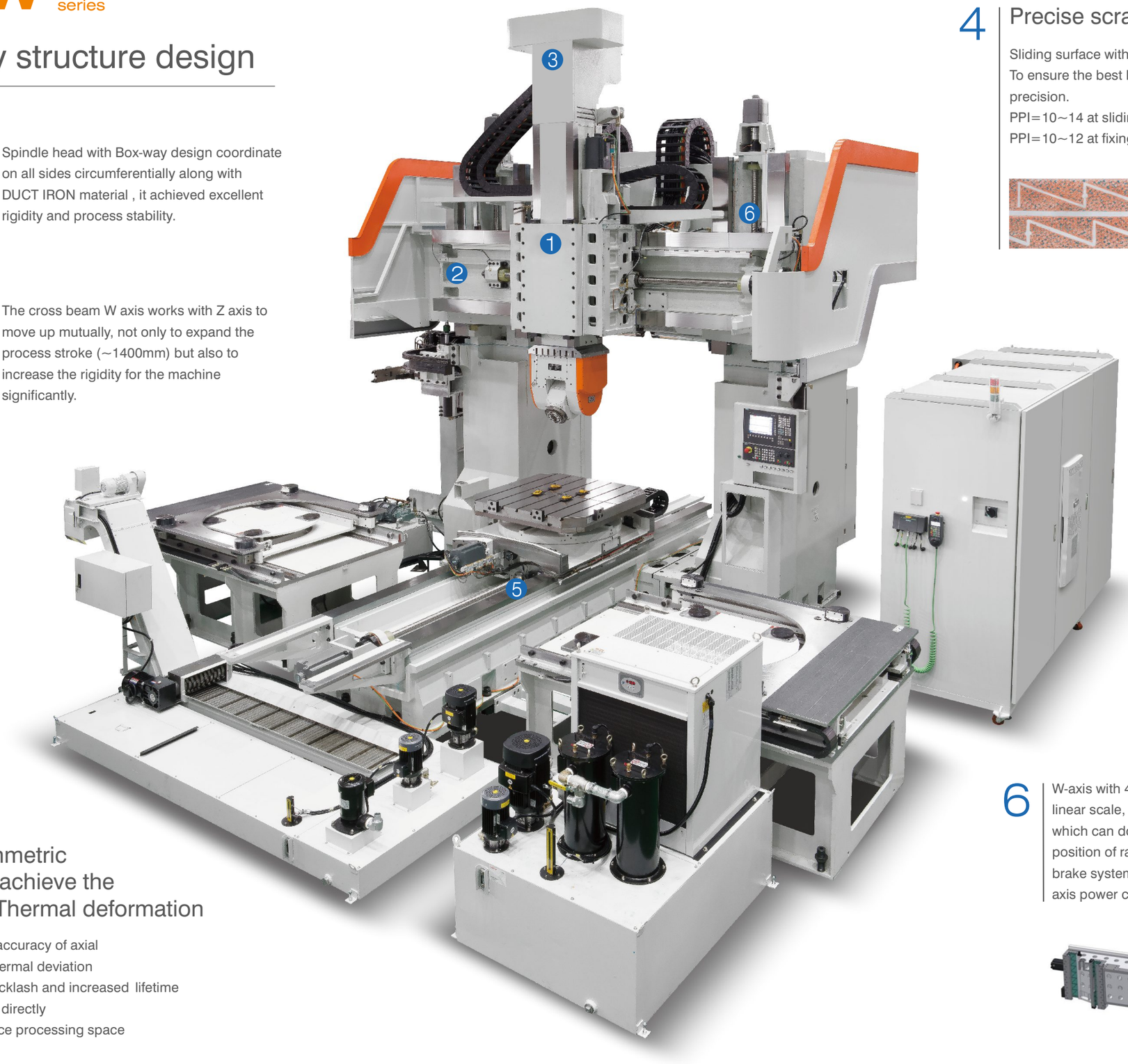
The most perfect application supporting and customer training
APEC is the company that specializes in machining for Aerospace and Automobile industries.
APEC team, by analyzing the processing demand from customers, not only recommends the suitable equipment but also provide the complete solutions. It helps the improving of machining efficiency and accuracy, and it upgrades the processing.

MDU-W series

High rigidity structure design

1 Spindle head with Box-way design coordinate on all sides circumferentially along with DUCT IRON material , it achieved excellent rigidity and process stability.

2 The cross beam W axis works with Z axis to move up mutually, not only to expand the process stroke (~1400mm) but also to increase the rigidity for the machine significantly.

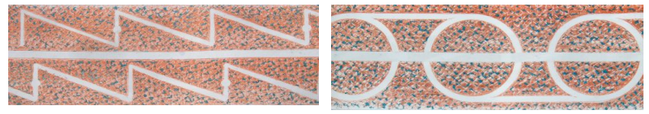


3 Centrosymmetric spindle to achieve the minimum Thermal deformation

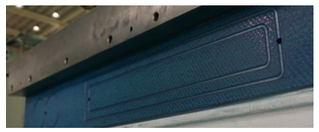
- To ensure the accuracy of axial
- Minimum of thermal deviation
- Reduce the backlash and increased lifetime
- Power transfer directly
- Non-interference processing space

4 Precise scraping

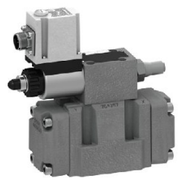
Sliding surface with Turcite-B, and standard scraping requirements.
To ensure the best lubrication effect, and it also Increasing mechanical precision.
PPI=10~14 at sliding surface under 70% contacting surface.
PPI=10~12 at fixing surface under 60-80% contacting surface.



5 The air floating design for X-axis is equipped with four “pneumatic pocket” to reduce the friction caused by the weight of workpiece.



6 W-axis with 4 box ways design, each side of it install with, optical linear scale, counterweight system adopted proportional valve which can do counter-balance compensation based on the position of ram automatically. W-axis’s with hydraulic clamping brake system can do 5-axis machining simultaneously and fixed-axis power cutting.

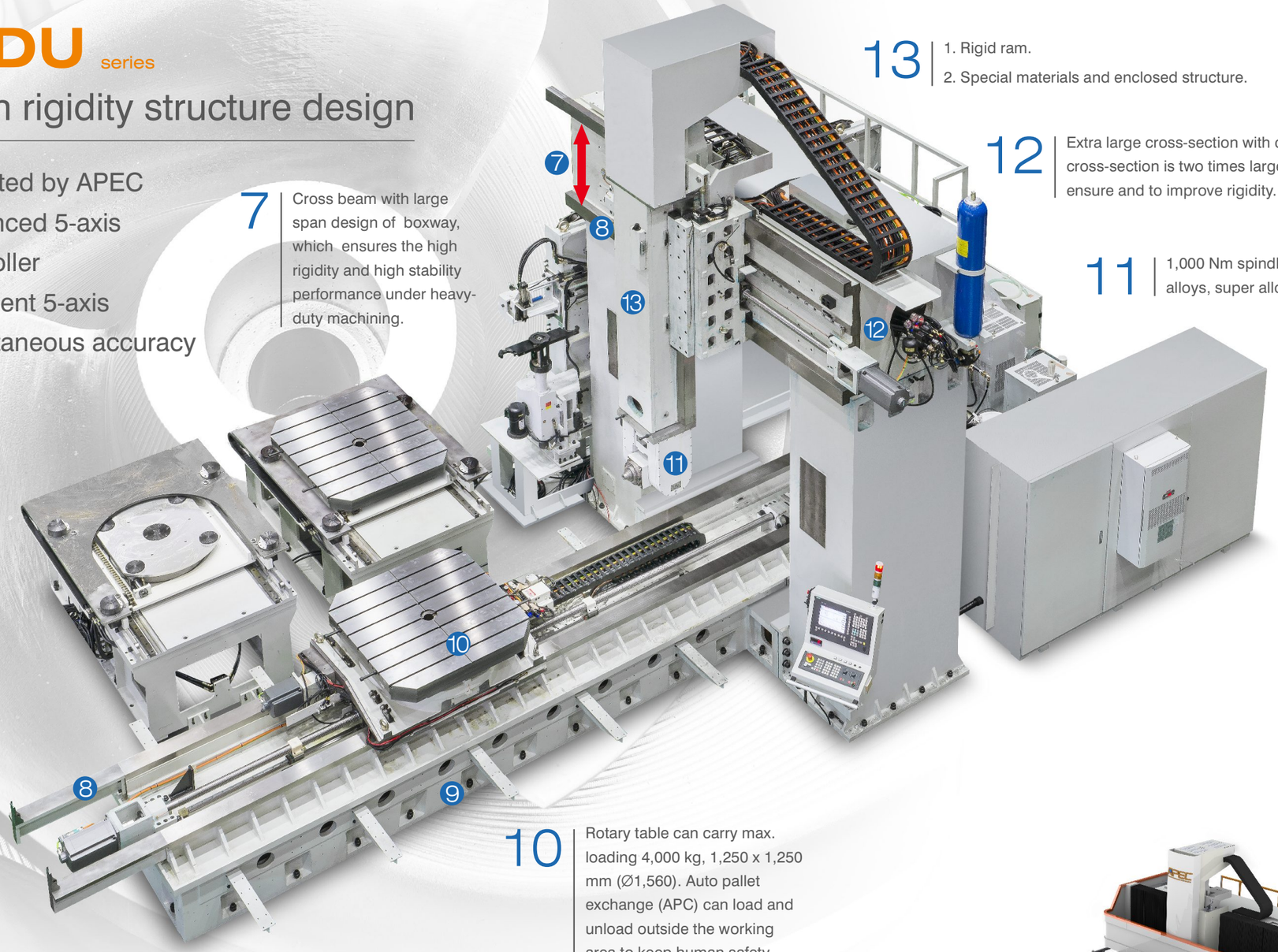


MDU series

High rigidity structure design

Patented by APEC
Advanced 5-axis controller
Excellent 5-axis simultaneous accuracy

7 Cross beam with large span design of boxway, which ensures the high rigidity and high stability performance under heavy-duty machining.

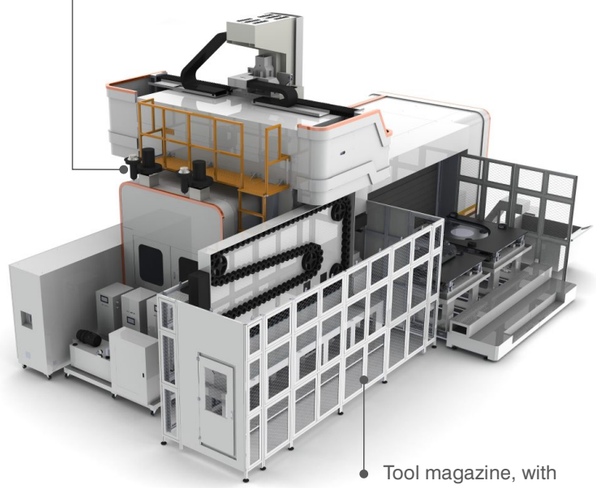


13
1. Rigid ram.
2. Special materials and enclosed structure.

12 Extra large cross-section with casting columns and cross beam, the cross-section is two times larger than general machines, this is to ensure and to improve rigidity.

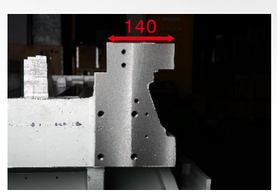
11 1,000 Nm spindle cutting torque for titanium alloys, nickel-based alloys, super alloys, and other difficult materials.

- Oil mist collection system ensures workshop air quality and operation human health.



- Tool magazine, with covers and door, is compliant with safety regulations.

10 Rotary table can carry max. loading 4,000 kg, 1,250 x 1,250 mm (Ø1,560). Auto pallet exchange (APC) can load and unload outside the working area to keep human safety.



9 An base, working table, columns, cross beam, saddle and ram are all made of high quality casting.

8 Extra large boxway design has passed through harden heat treatment and precision grinding, and with large span design to reach max. strength and high accuracy to increase the machine loading capacity effectively.

- Full-enclosure guard, safety sensor, and reinforced window to keep human safety and bring a clear observation.

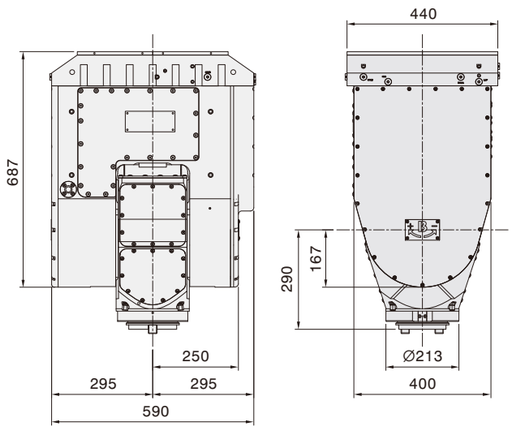
Design advantages

Minimum machining interference in the industry

Head width 590mm only, swivel axis (B-axis) by radius 290mm only so that no additional heads needed for internal machining space, to provide flexible rooms for machining.

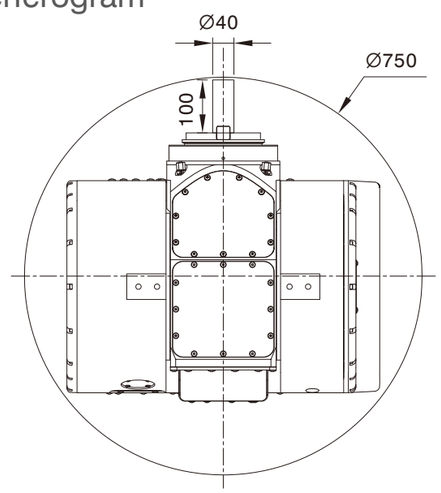
(Sta.)

Swivel head layout

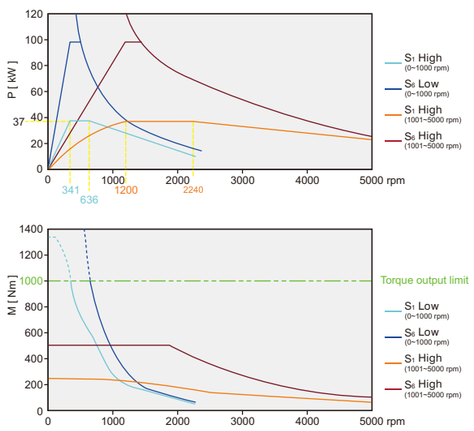


Spindle taper	CAT50 / ISO50 / HSK100A
Spindle speed	3,000 / 5,000 rpm
Spindle power (S1/S6)	37 / 40 kW
Spindle torque	1,000 Nm
Swivel speed	10 rpm
Swivel torque (S6)	3,200 Nm
Swivel/Rotation angle	±110°

Interferogram

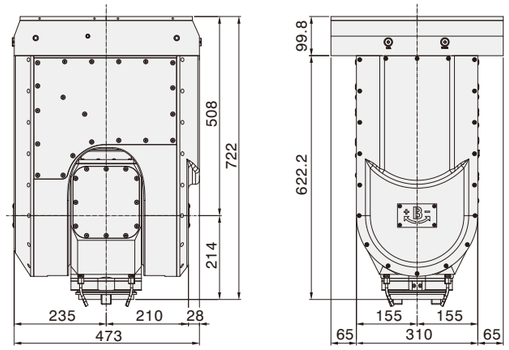


Spindle power and torque



(Opt.)

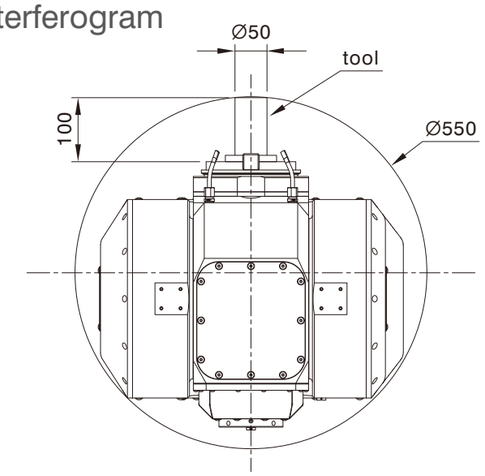
Swivel head layout



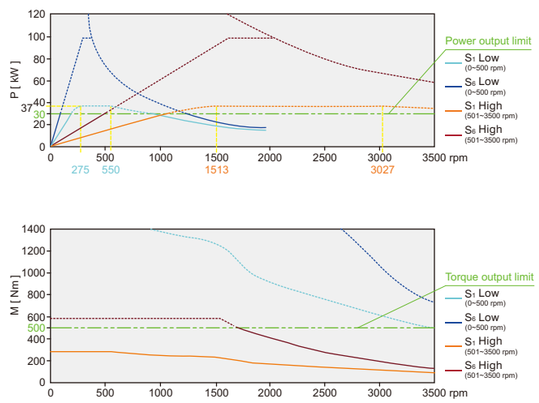
Spindle taper	CAT50 / ISO50 / HSK100A
Spindle speed	3,500 rpm ※
Spindle power (S1/S6)	30 kW
Spindle torque	500 Nm
Swivel speed	10 rpm
Swivel torque (S6)	2,000 Nm
Swivel/Rotation angle	±110°

※Spindle speed 5,000 rpm (Opt.)

Interferogram

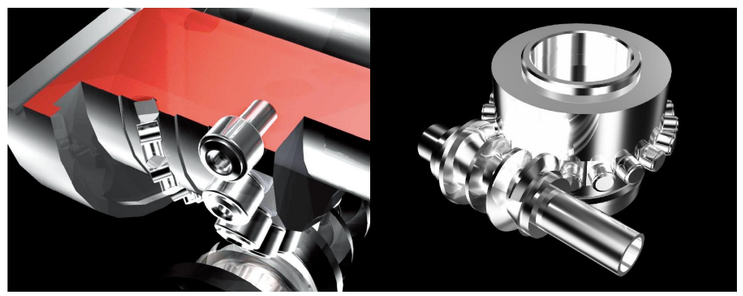


Spindle power and torque



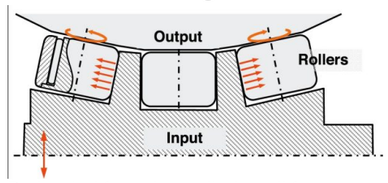
Design advantages

c axis rotary talbe using high rigid roller gear cam mechanism technology transferred by Japan



- Zero backlash
- High positioning accuracy
- Low abrasion
- Higher durability (than worm-gear type)

Preload configuration



Preloaded force is applied to all force direction to eliminate backlashes.

High precision, long life

Because C-axis rotary table is driven by roller gear cam with rolling contact between roller and cam, it can start at a lower torque. Benefits are zero backlash with double-sided contact, low vibration, long life, high accuracy, and better than conventional worm-gear mechanism.

Inside rotary table, roller gear cam connects to a high torque spindle so that high accuracy is guaranteed under long-term heavy-duty cutting.

Working table positioned by high accuracy taper cone (Solic lock system)

Stable support while machining

Each of four taper cones is double-side contact to increase the stability and rigidity, and with hydraulic locking mechanism, each contact surface can produce 20 tons of clamping force. It is to ensure working table stable supported while machining.

In case of power failure, auto self-lock system starts and protects machine and workpiece

With auto self-lock system allows the user at the time of the machine collision, power off or hydraulic failure to avoid possible danger.

Dual safety device to ensure mechanism clamping tables properly

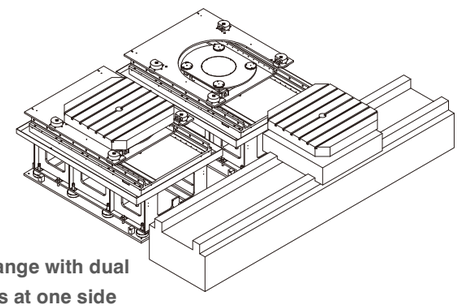
With air sensor, if the taper cone is not clamped properly, it sends out an alert to ensure machining safety.

Auto pallet exchange system / Flexible manufacturing system (opt.)

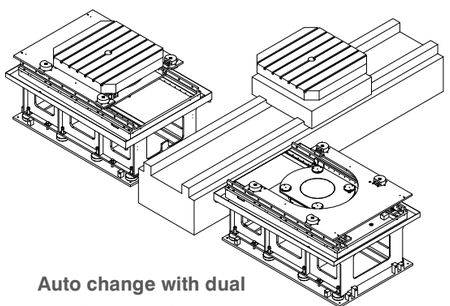
Single machine production

With this option, while the machine is running, another working table is loading and unloading workpiece. This increases production duty rate.

2 working table placements: 1.tables at same side; 2. tables at opposite sides.



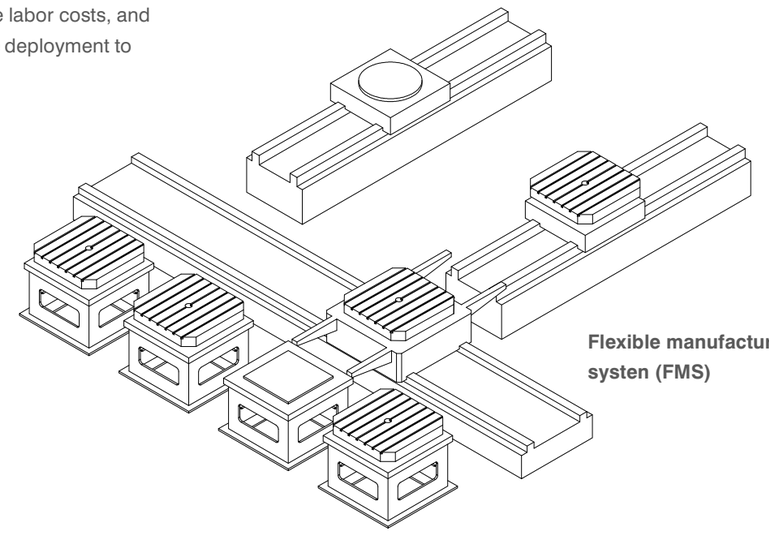
Auto change with dual positions at one side



Auto change with dual positions at either side

Mass production line

With FMS (flexible manufacturing system), it can reduce the delivery time, lower the labor costs, and production costs. It can rearrange deployment to meet needs of mass production.



Flexible manufacturing systen (FMS)

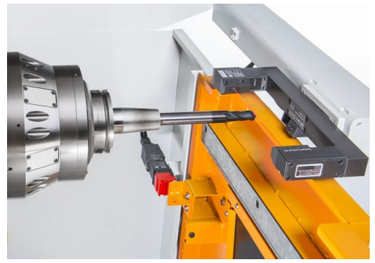
Automation & intelligence

Workpiece measurement-ireless(Opt.)

- Rapid measuring can increase productivity.
- No ball-bar circular deviation.
- Measuring result independent of coolant viscosity on work piece surface.

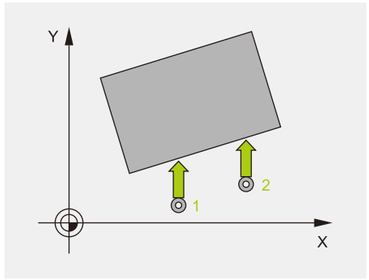
Laser tool measuring system (Opt.)

- Tool length/diameter measurement.
- Tool breakage and deflection monitoring.
- Measuring result not affected by coolant on tools.



Automatic workpiece position correction (Opt.)

Significantly reducing the workpiece installation and calibration time.

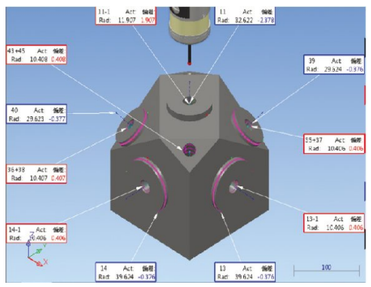


Auto 5-axis accuracy calibration system (Opt.)

- Rapid 5-axis accuracy auto measurement and calibration.

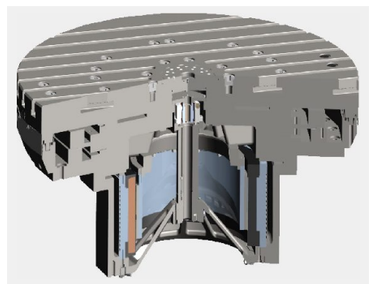
Workpiece profile comparison package (Opt.)

Just after machining, auto and direct workpiece contour and CAD solid model comparison can be done on machine to ensure machining accuracy.



Turning & Milling (Opt.)

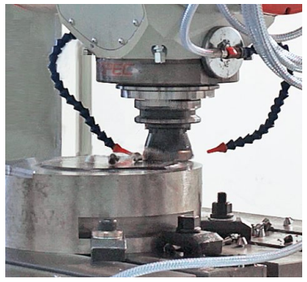
Torque motor drive of the table with a special tool, milling and cutting can be done at the same time.



MDU-W

machining capacity

Power cutting of titanium

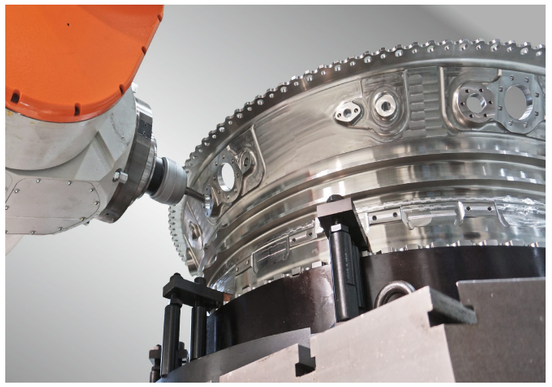


Material : Ti6Al4V
Tool : insert tool D80
Spindle speed : 200rpm
Feed : 1100mm/min
Depth : 3.5mm
Width : L32mm
Q : 123.2cm^3/min

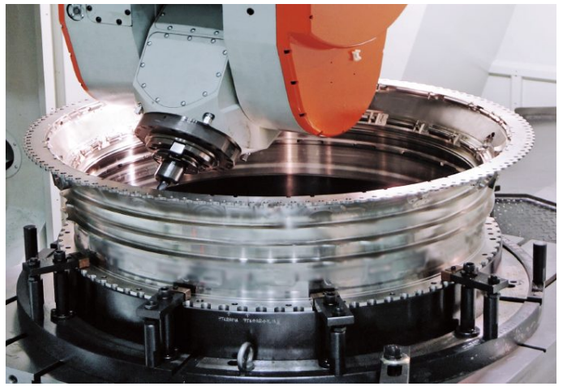
Power cutting of steel

Material : S45C
Tool : insert tool D160
Spindle speed : 497rpm
Feed rate : 764mm/min
Depth : 5mm
Width : 140mm
Q: 534.8cm^3/min

External engine machining



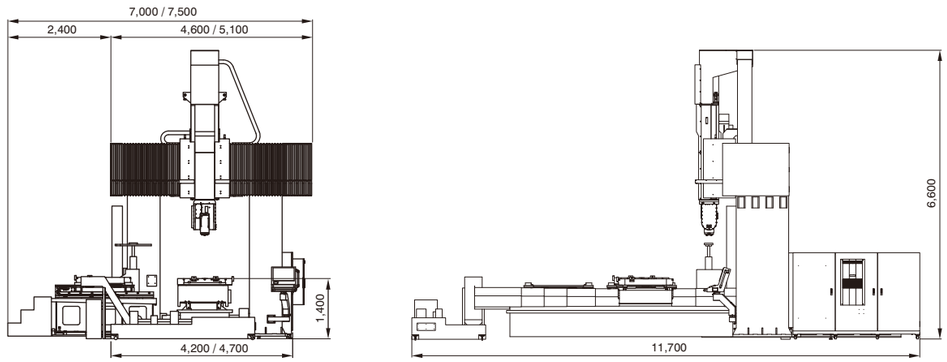
internal engine machining



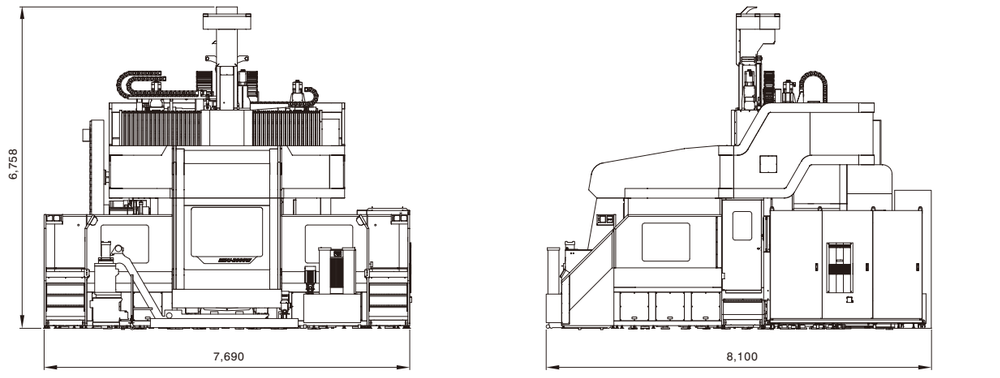
Machine Dimensions

MDU

Unit : mm



MDU-W



Mechanical appearance

Machine Specifications

Specifications	Unit	MDU	MDU-W
Travel			
X-axis	mm	2,000 / 2,500 (excluding APC travel)	
Y-axis	mm	2,000 / 2,500	
Z-axis	mm	800	
W-axis	mm	–	600
Distance between two columns	mm	2,000 / 2,500	
Distance between spindle nose to table surface	mm	B-axis 0°= 200~1,000 B-axis 90°= 500~1,300	B-axis 0°= -100~1,300 B-axis 90°= 190~1,590
Spindle			
Spindle taper		CAT50	
Spindle speed	rpm	5,000	
Spindle power (S1/S6)	kW	37 / 40	
Spindle torque (S1/S6)	Nm	1,000	
Swivel head (B-axis)			
Swivel speed	rpm	10	
Swivel torque (S1/S6)	Nm	3,200	
Clamping torque	Nm	5,000	
Swivel angle	deg	±110°	
Rotary working table (C-axis)			
Rotate speed	rpm	5	
Rotate torque (S1/S6)	Nm	8,500 / 29,000	
Clamping torque	Nm	16,000	
Rotate range	deg	360° (cont.)	
Max. table size	mm	1,250 x 1,250	
Table load	kg	4,000	
Traverse			
Rapid traverse	m/min	XYZ=10	
Automatic Tool Changer			
Tool magazine capacity	pc	60	
Max. tool diameter -with adjacent tool	mm	Ø125	
Max. tool diameter -without adjacent tool	mm	Ø250	
Max. tool weight per piece	kg	25	
Max. tool length	mm	400	

※ All specifications and designs are subjected to change without notice.

Standard accessories

- Siemens Sinumerik 840D controller
- Automatic tool magazine 60 tools
- 5-axis with Heidenhain linear scales
- X/Y/Z-axis with boxway
- German made ZF gear box
- Air conditioner for electrical cabinet
- Chiller for spindle
- Counter balance system
- Manual pulse generator
- Auger type chip conveyor
- Chip conveyor
- Transformer
- Security door interlock
- Waterproof lamp
- Full-enclosure splash guard (without roof)

Optional accessories

- Heidenhain iTNC530 CNC controller
- Spindle speed with 5,000 rpm
- Coolant through spindle 20/70 bar
- Coolant around spindle nose
- Inverter cooling system
- Automatic voltage regulator
- Automatic tool change 120 tools
- Tool management system
- Coolant tank with pumps
- Oil skimmer with anti-bacterial filtering system
- Oil mist collector
- Oil mist filter system
- Chip cart
- Laser tool measuring system
- Workpiece measuring-wireless data transmission
- Workpiece profile inspection system
- Auto 5-axis accuracy calibration system
- Flexible manufacturing system
- Automatic pallet exchanger
- Mill-Turn integration (Please contact sales for more details.)
- Full-enclosure splash guard (with roof)