



We lead the way by a new business model



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MT SERIES



Bridge Type
Multi-Milling-Turning
Machining Center ▶▶▶▶▶

WELE MECHATRONIC CO., LTD

MT-16	MT-20	AA65 Series RB Series	AA80 Series SB Series	AA90 Series LB Series	AQ Series MB Series	VQ Series HB Series	UG Series UB Series	UA Series MG Series	VTC Series MVB Series	MT series
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MT SERIES

Multi Milling & Turning Center with five sides and vertical turning purpose

- Multi-task application in one machine which has 5 sides milling and turning machining purpose to satisfy the customers' various applications and demands.
- One for a vary of the machining which including milling, turning, boring, and drilling in the MT machine.



Vertical spindle:

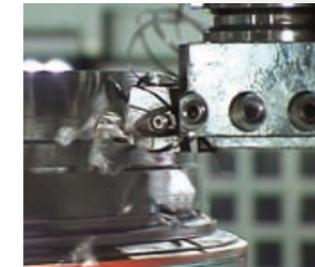
- Attached the 6000rpm gear-driven spindle provides the Max. output torque 740Nm.
- Optional available on
3000rpm (Gear-driven)
4000rpm (Gear-driven)
5000rpm (Gear-driven)
8000rpm (Built-in driven)
12000rpm (Built-in driven)

Automatic Head Exchange system:

- Equipped with the protect cover, 90 degree head, and turning head. (STD)
- Provides the five-sides and turning function.

Automatic Tool Exchange system:

- Equipped with the multi-functions tooling for turning job. (OPT)
- Fully automatic tool exchange for vertical/ horizontal type and turning tools.
- The mechanism design not only save tool exchange time, but also increases efficiency and quality. (Patent)



Turning head (STD)



90 degree head (STD)

Rotating & Indexing table:

- Uses the ultra-heavy loading taper roller bearing for radial force support.
- Hydro-static bearing designed on axial bearing support, to ensure the long term accuracy and heavy cutting force.
- Special for milling application which provides the high positioning accuracy in index table (0.001 degree).
- Uses the dual servo Tandem control system to enhance the high torque transmission and to eliminate the backlash.
- Table size $\varnothing 1.6m$ as standard; $\varnothing 2m$ optional available.



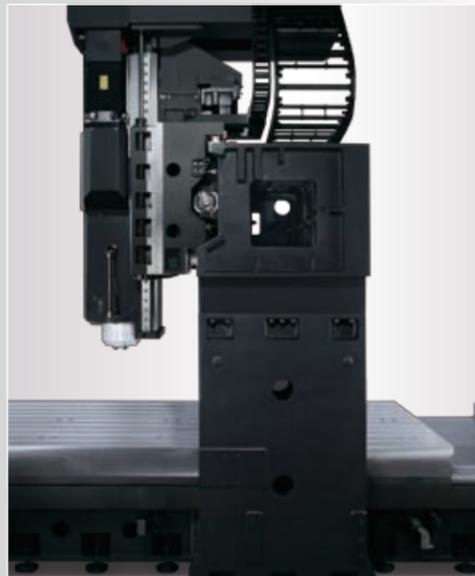
Spec.

- Above figure shown as MT-16 machine with roof enclosure guarding and some optional accessories.

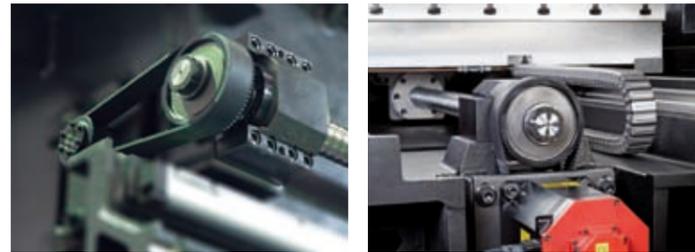
MT-16	MT-20	AA65 Series	AA80 Series	AA90 Series	AQ Series	VQ Series	UG Series	UA Series	VTC Series	
		RB Series	SB Series	LB Series	MB Series	HB Series	UB Series	MG Series	MVB Series	MT series

Rigid Construction and Design Concept

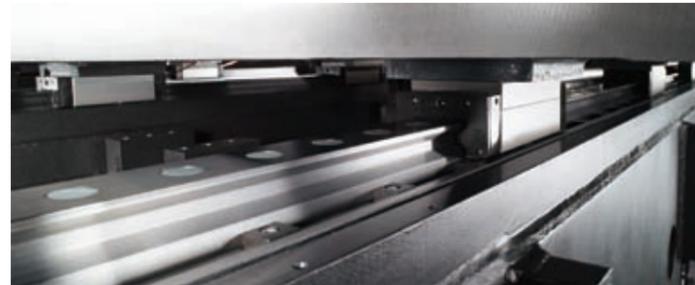
- All of main structures designed by computer dynamic simulation and analysis that provides the excellent rigidity and precision accuracy.
- All casting and welding parts had been fully annealed to guarantee long term accuracy for the machine.
- All axes except rotating table are using ultra-heavy loading and low friction coefficient of linear roller guide way.



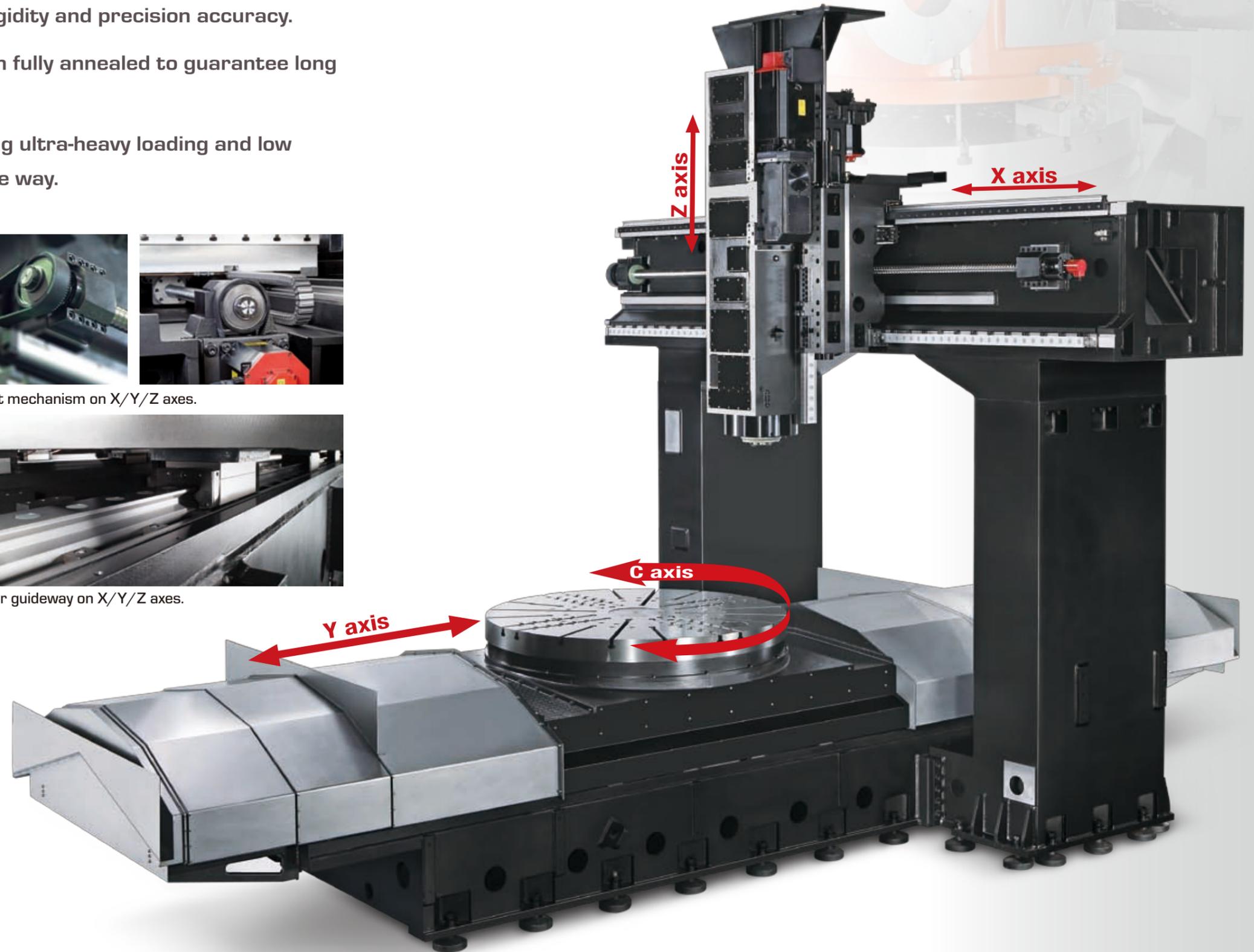
Cross section shown the cross beam designed for higher rigidity with 20% enhance above.



Torque limit mechanism on X/Y/Z axes.



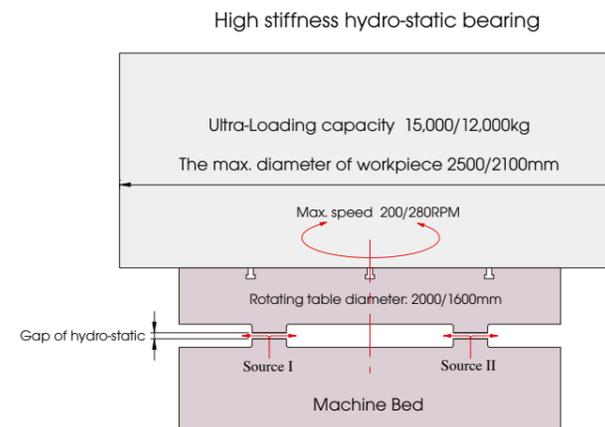
Linear roller guideway on X/Y/Z axes.



MT-16	MT-20	AA65 Series	AA80 Series	AA90 Series	AQ Series	VQ Series	UG Series	UA Series	VTC Series	
		RB Series	SB Series	LB Series	MB Series	HB Series	UB Series	MG Series	MVB Series	MT series

Features of the Rotating Table

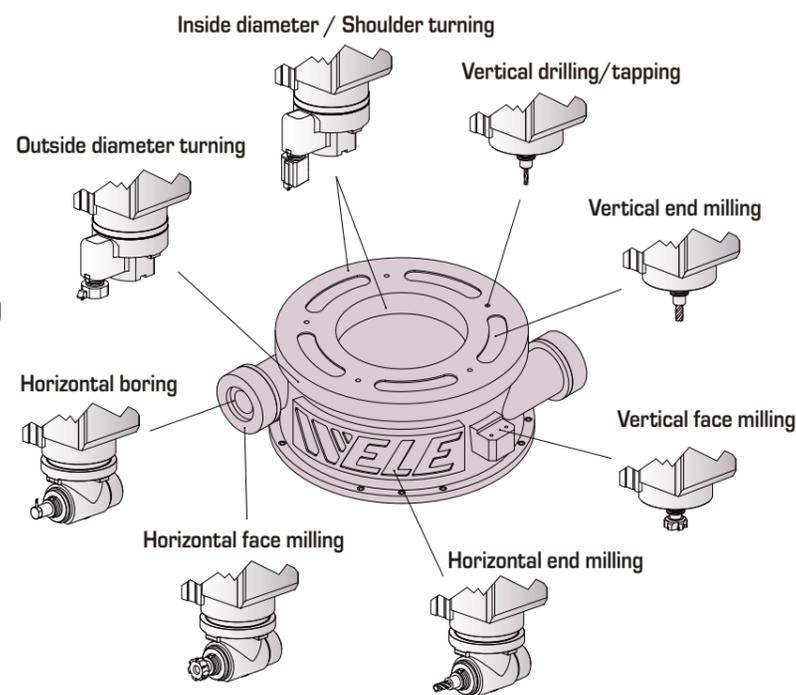
- WELE own developed rotating & indexing table which is adapted with the hydro-static bearing for the ultra-heavy loading and cutting force.
- Dual servo driven Tandem control system attached on the rotating & indexing table, not only to eliminate the backlash, but also to provides the cutting torque. It is not only for turning job, but also for the indexing application. (Resolution: 0.001 degree)
- Patent pended on monitoring the hydro-static bearing status that its life time and accuracy can be maintained.



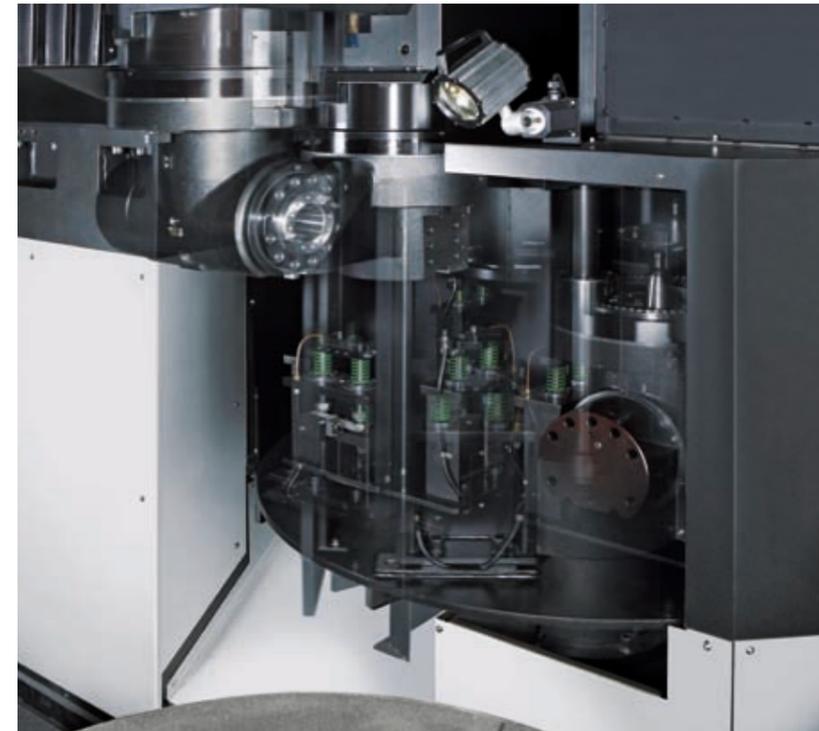
Application

WELE developed advance MT series machines to meet the customers' vary demands and general purpose, such as:

- Oil & Gas industry
(ex. Hydro-electrical power generator's parts)
- Aerospace industry
(ex. Turbine housing)
- Transportation industry
(ex. Car's part, Die and Mold)
- Huge and round shape parts
(ex. Bearing, Gear, Hub, and Valve parts)



Fully Automatic Tool/ head exchange



- Automatic head exchange system :
Turning head, 90 degree head, and protect cover.



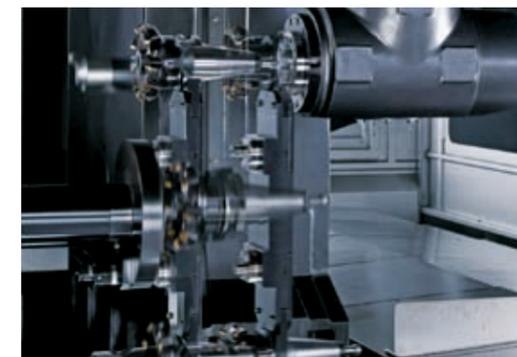
- Automatic protect cover exchange



- Automatic turning head exchange



- Automatic vertical tool exchange.



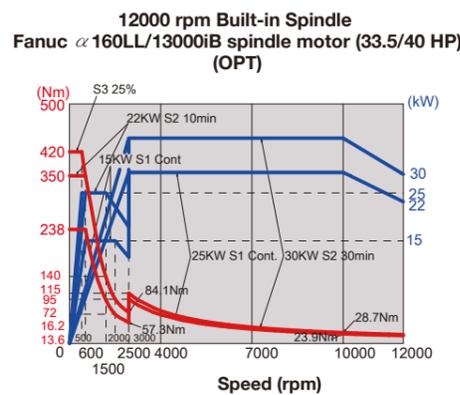
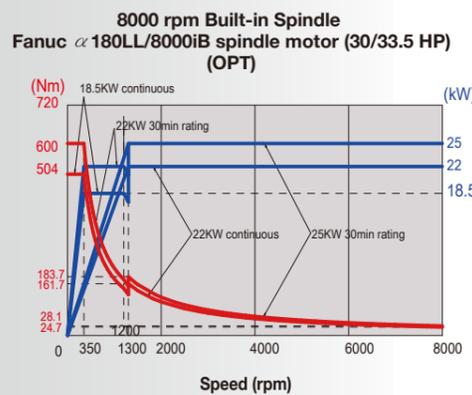
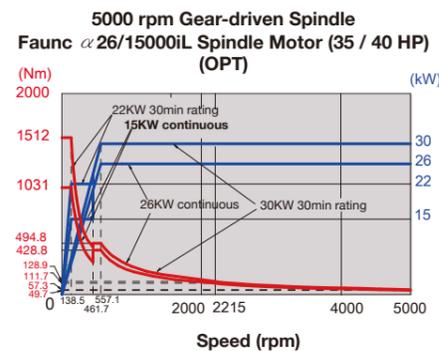
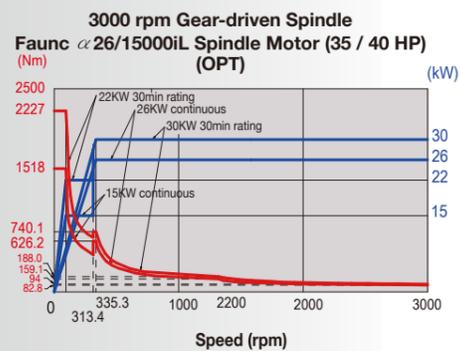
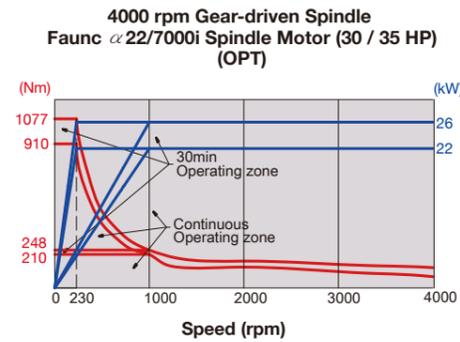
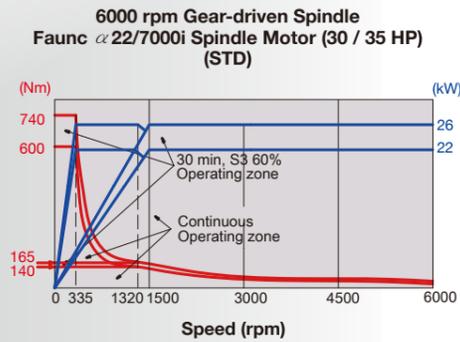
- Automatic horizontal tool exchange.



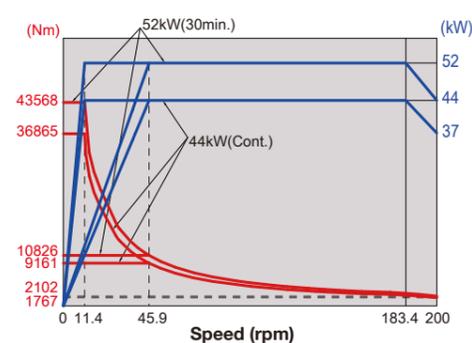
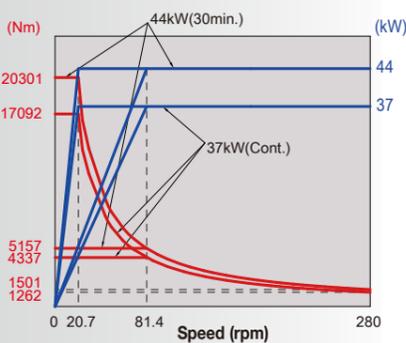
- Automatic turning tool exchange.

Spindle Output Torque Chart

Vertical spindle:



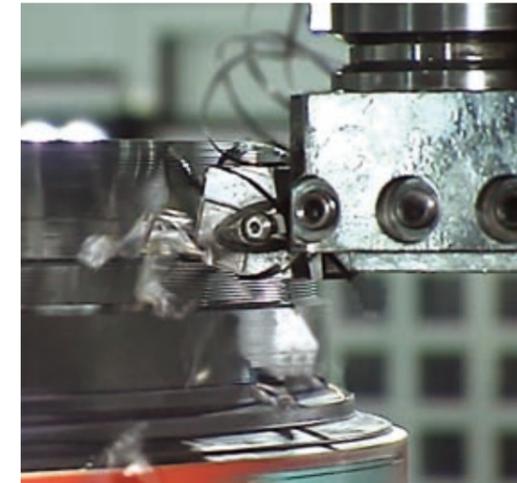
Rotating & Indexing Table:



High efficiency machining performance

Powerful turning performance - **1,650 cc/min**

Workpiece material: S45C



MT-16	
Rotating Table power	37/44 kW
Linear velocity (Vc)	143.5 m/min
Cutting depth (Ap)	11.5 mm
Feed per rev. (fz)	1.0 mm/rev
Mass Removal rate (MRR)	1,650 cc/min

Face cutting performance - **660 cc/min**



Milling spindle power	22/26kW
Milling tool	Φ 125x6 teeth
Cutting width (Ae)	100 mm
Cutting depth (Ap)	6 mm
Feedrate (f)	1,100 mm/min
Mass Removal rate (MRR)	660 cc/min

End milling performance - **550.4cc/min**



Milling spindle power	22/26kW
Milling tool	Φ 40x4 teeth
Cutting width (Ae)	8 mm
Cutting depth (Ap)	32 mm
Feedrate (f)	2,150 mm/min
Mass Removal rate (MRR)	550.4 cc/min

Genius Design and Experienced Technology



Strictly Quality Assurance



Leading and Reliable Electrical Technology

- Friendly operator control panel.
- On AUTO mode, execute tool exchange at magazine side.
- Prevent over travel (OT) error in operation
- High efficiency heat exchanger to cooling the electrical cabinet
- UL wiring and CE certification are optional available.
- Centralize automatic lubricating system on all axial guideway and feed system.
- Design for monitor of spindle overloading and protection.
- Auto-backup function for machine parameters.
- USB interface for data transfer.
- Mix type tool number management including random and fix Tool#.
- Trouble shooting screen in NC memory.
- Standard is AICC look ahead in 200 blocks/sec. ; 600, 1000 blocks/sec. are optional available.

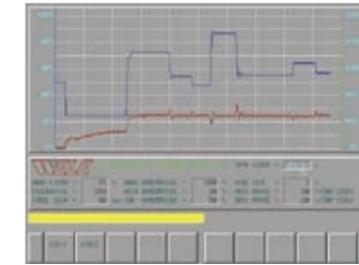


Advance Technology and Convenient Functions



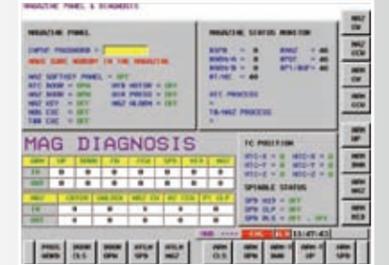
Thermal Compensation Mode (TCM - Option)

Environmental and machining temperature can bring the caused the machine deformation. An unique technology of thermal compensation function can be reduced the machine error correctly.



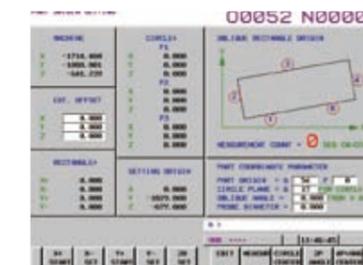
Feed Adaptive Control (FAC)

To provide the customer increase their working efficiency. We called it FAC (Feed Adaptive Control). It does not need any adjustment the machine can reach a perfect cutting condition while the machine in operation.



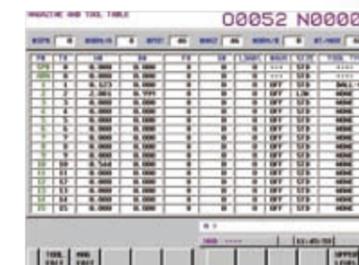
Tool Magazine Panel and I/O diagnose

To provide the customers diagnose the tool magazine's I/O status be conveniently and do the trouble shooting.



Oblique Part Origin (OPO)

The function is not only create the reference points in one workpiece but also calculates the length, width, and diameter of workpiece. and it will be defined the workpiece dimension rapidly.

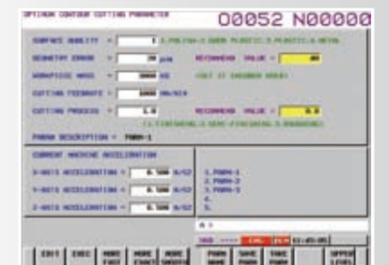


Tool Table Management (TTM)

The WELE Tool Table has its advantage as below:

- Tool number management
- Geometric compensation
- Cutting condition setting
- Random tool management.

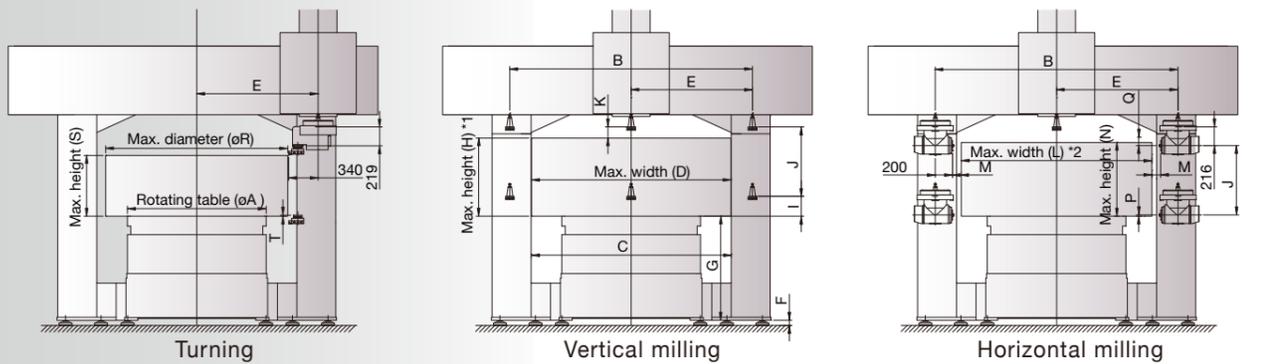
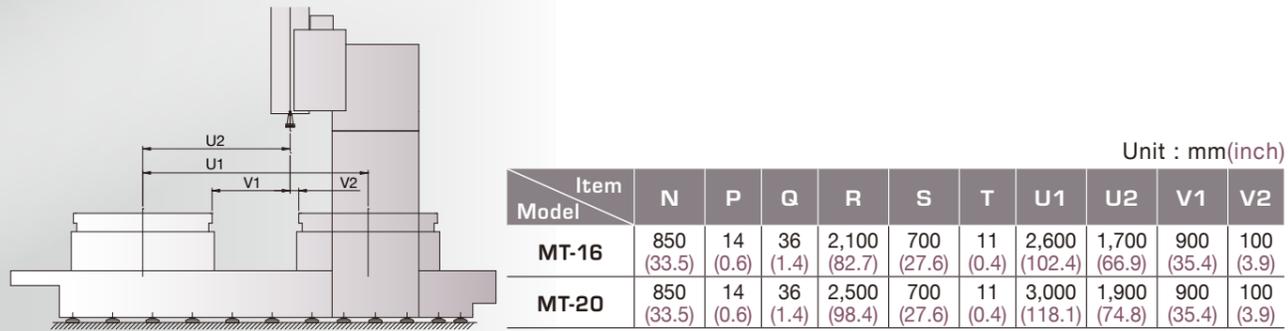
Mentioned above function can be provided to meet the requirement of the customer.



Optimum Contour Cutting Parameter (OCCP)

WELE own developed the unique optimized cutting condition software which can be adjusting the cutting condition automatically according to the machine response presently. When the machine is using for a while, the optimized cutting condition software can be detected the variation of the machine performance and verify the parameter in accordingly.

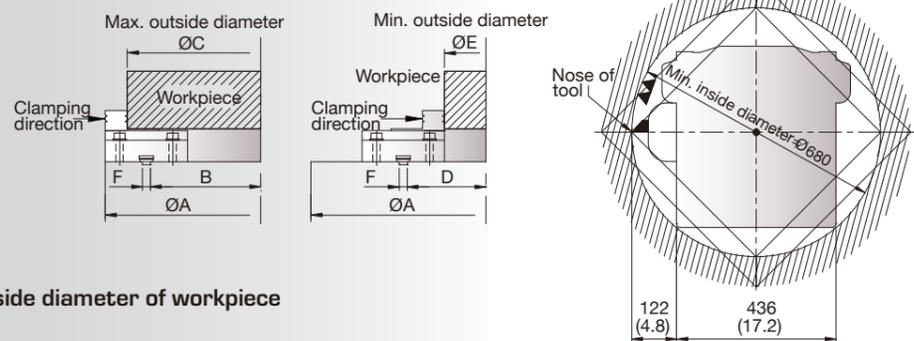
Working Envelope Dimensions



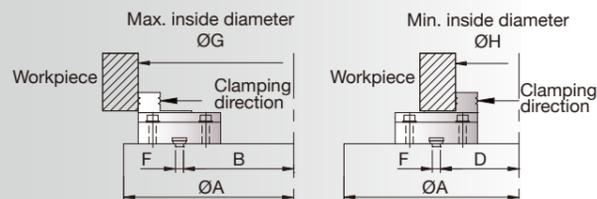
*1: [Max. height of vertical milling] - Ref. Tool length (K) : 130mm
 *2: [Max. width of horizontal milling] - Ref. Tool length (M): 100mm

Working Envelope Dimensions for Clamping

Outside diameter of workpiece



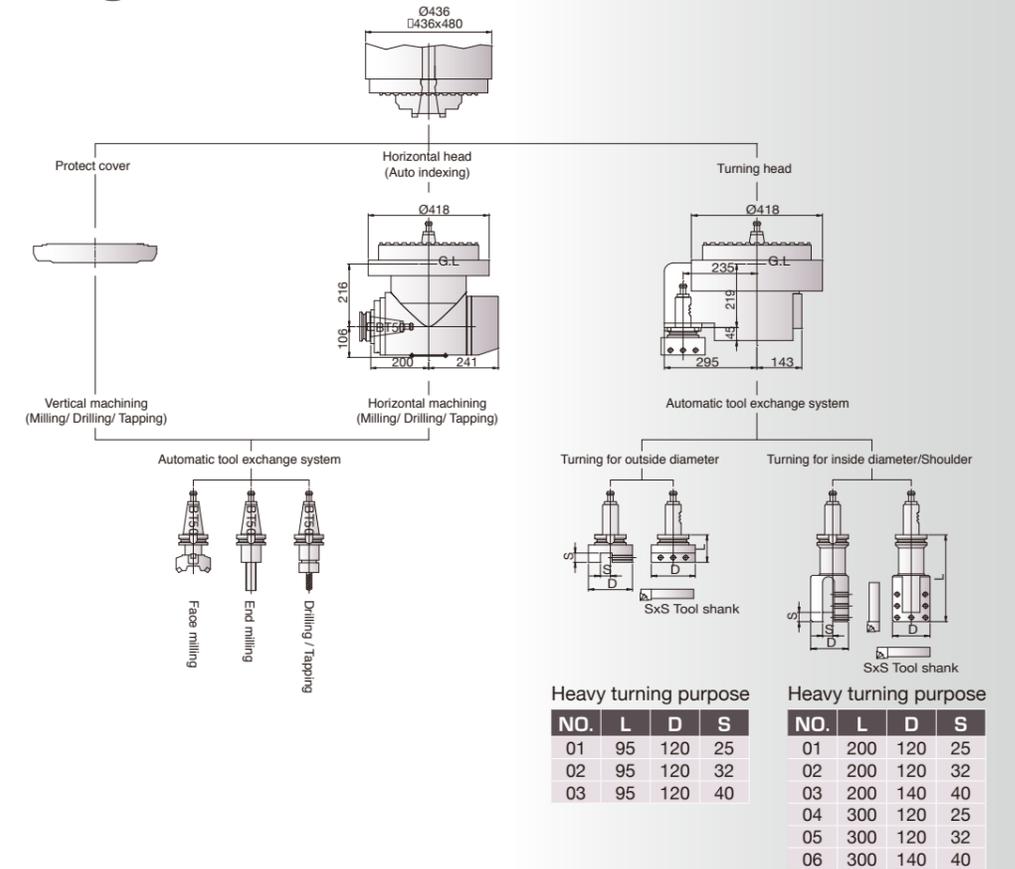
Inside diameter of workpiece



Item Model	A	B	C	D	E	F	G	H
MT-16	1600 (63)	695 (27.4)	1521 (59.9)	335 (13.2)	462 (18.2)	22 (0.9)	1641 (64.6)	582 (22.9)
MT-20	2000 (78.7)	901 (35.5)	1933 (76.1)	316 (12.4)	424 (16.7)	22 (0.9)	2053 (80.8)	544 (21.4)

Unit : mm(inch)

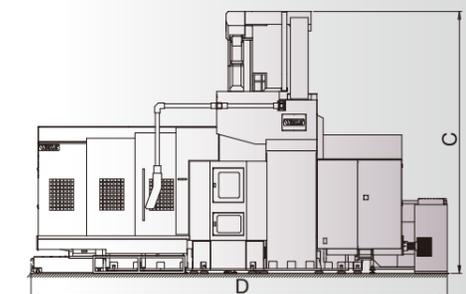
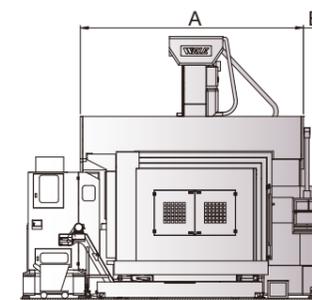
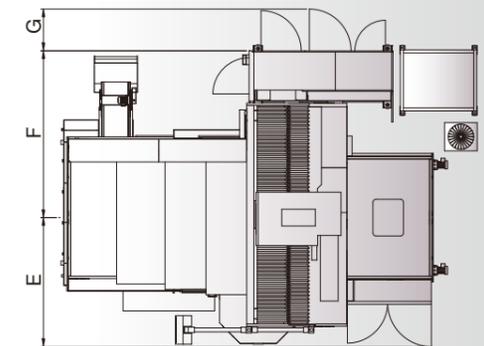
Spindle Configuration



Machine Dimensions and Space Requirement

Mode	A	B	C	D	E	F	G
MT-16	4,400 (173.2)	360 (14.2)	4,600 (181.1)	8,200 (322.8)	2,550 (100.4)	3,300 (129.9)	820 (322.3)
MT-20	4,800 (189.0)	360 (14.2)	4,600 (181.1)	9,200 (362.2)	2,750 (108.3)	3,500 (137.8)	820 (322.3)

Unit : mm(inch)



Technical specifications

Specification	Unit	MT-16	MT-20
Machining capacity			
X axis travel	mm(in)	2800 (110.2)	3200 (126.0)
Y axis travel	mm(in)	2600 (102.4)	3000 (118.1)
Z axis travel	mm(in)	800 (31.5)	
Table diameter	mm(in)	1600 (63.0)	2000 (78.7)
Max. turning height	mm(in)	700 (27.6)	
Max. swing diameter	mm(in)	2100 (82.7)	2500 (98.4)
Distance between columns	mm(in)	2308 (90.9)	2708 (106.6)
Distance from table top to spindle nose (V type)	mm(in)	230-1030 (9.1-40.6)	
Distance from table top to spindle center line (H type)	mm(in)	14-814 (0.6-32.0)	
Distance from table top to turning tool's face	mm(in)	11-811 (0.4-31.9)	
Milling spindle unit			
Spindle motor	kW(HP)	22/26 (30/35)	
Spindle speed-Vertical	rpm	10-6000	
Spindle speed-Horizontal	rpm	10-2400	
Spindle output torque (cont. / 30min rating)	Nm (ft-lb)	626.2/740.1 (461.8/545.8)	
Spindle taper		#50	
Rotating & Indexing table unit			
Rotating table motor	kW(HP)	37/44 (49.6/59)	44/52 (59/69.3)
Rotating table speed	rpm	10-280	10-200
Rotating table output torque (cont. / 30min rating)	Nm (ft-lb)	17092/ 20301 (12596/ 14961)	36865/ 43568 (27168/ 32107)
Rotating table loading	kg(lb)	12000 (26400)	15000 (33000)
Feedrate			
X/Y axis rapid feedrate	mm(in)/min	15000/20000 (590.6/787.4)	15000/18000 (590.6/708.7)
Z axis rapid feedrate	mm(in)/min	15000 (590.6)	
X/Y/Z axis cutting feedrate	mm(in)/min	1-10000 (0.04-393.7)	
Tool magazine unit			
Tool magazine capacity	set	32 (Milling tool and turning tool)	
Max. tool diameter/ adjacent pocket empty	mm(in)	127/215 (4.9/8.5)	
Max. tool length (from gauge line)	mm(in)	400 (15.7)	
Max. tool weight	kg(lb)	20 (44)	
Spindle taper		#50	
Turning tool section size	mm(in)	□32x32 (1.26x1.26)	
Accuracy			
X/Y/Z axis positioning accuracy (VDI, P)	mm(in)	P=0.025/full stroke	
X/Y/Z axis repeatability accuracy (VDI, Ps mean)	mm(in)	Ps=0.020	
C axis positioning accuracy (VDI, P)	arcsec	30	
C axis repeatability accuracy (VDI, Ps mean)	arcsec	15	
Space requirement and others			
Power requirement (220V +/- 10% , 3 phase, 50/60 Hz)	kVA	75	
Pneumatic requirement	kg/cm ²	5	
Machine width	mm(in)	6670 (262.6)	7070 (278.3)
Machine length	mm(in)	8200 (322.8)	9200 (362.2)
Machine weight	kg(lb)	30000 (66000)	35000 (77000)

**Product specifications and accessories are subject to change without notice.

**Specially order are also available on request.

Standard and optional accessories

● : Standard ○ : Option

Item \ Model	MT-16	MT-20
Z axis travel extend to 1000mm (39.4")	○	○
Vertical Spindle : 6000 rpm geared spindle (30/35HP)	●	●
Vertical Spindle : 4000 rpm geared spindle (30/35HP)	○	○
Vertical Spindle : 3000 rpm geared spindle (35/40HP)	○	○
Vertical Spindle : 5000 rpm geared spindle (35/40HP)	○	○
Vertical Spindle : 8000 rpm built-in spindle (30/33.5HP)	○	○
Vertical Spindle : 12000 rpm built-in spindle (33.5/40HP)	○	○
4 jaws manual chuck	●	●
Adjustable torque limit clutch on X, Y, Z axis	●	●
Twin semi close-loop feed system on X, Y, Z axis	●	●
Spindle cooling system	●	●
Recycling collectors for lubrication on X, Y, Z axis	●	●
Hydraulic system	●	●
Pneumatic system	●	●
Centralized guide ways lubrication system	●	●
Coolant system and regular tank	●	●
Coolant through the tool adapter	○	○
Coolant through the spindle (Form A) w/1000 liter tank	○	○
Full splash guard	●	●
Roof enclosure guarding system	○	○
Fully automatic tool exchange system (Vertical, Horizontal, and Turning tools)	●	●
Fully automatic head exchange system (Horizontal head/ Turning tool head)	●	●
Auto multi-head exchange and index in every 5° mechanism	●	●
32 tools capacity of chain type tool magazine	●	●
60 tools capacity of chain type tool magazine	○	○
90 tools capacity of chain type tool magazine	○	○
Oil-mist recycle system	○	○
Air conditioner on electrical cabinet	●	●
Linear scale feedback system for X, Y, Z axes (Fagor)	○	○
Hydraulic chiller	○	○
Oil skimmer	○	○
Work light, Operation cycle finish and alarm lights	●	●
Caterpillar type chip conveyor and bucket	●	●
Spray hose for chip washing down	●	●
Swing type operator panel (moveable in horizontal direction)	●	●
Hanging type operator panel (moveable in four direction)	○	○
RS-232 and RJ45's interface	●	●
MPG remote handwheel	●	●
Display type MPG remote handwheel	○	○
Technical manuals	●	●
Tool kit and foundational bolt	●	●
Data server (include 1GB memory Card)	○	○
Automatic tool length measurement (Blum)	○	○
Automatic workpiece measurement (Blum)	○	○
Fanuc 31iMB controller	●	●