



**WELE MECHATRONIC CO., LTD**  
(<http://www.welegroup.com>)

**HEADQUARTERS:**

No.458, Shinsing Rd., Hukou Town, Hsin-Chu County 303, Taiwan  
TEL : +886-3-696-0360 (rep.) FAX : +886-3-696-0370

**TAICHUNG BRANCH:**

No.356, Sanfeng Rd., Houli Dist., Taichung City 421, Taiwan  
TEL : +886-4-2558-0762 FAX : +886-4-2558-2334

**WELE MECHATRONIC (SU-ZHOU) CO., LTD.**

No. 16, Fuhua Rd., Changshu Economic Development Zone,  
Changshu City, Jiangsu Province, China 215513  
TEL : +86-512-5229-7868 FAX : +86-512-5229-7866



15072704 MacdS. TEL 04-2733326



We lead the way by a new business model

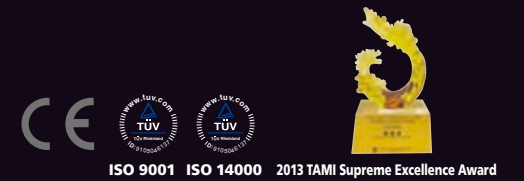
MT/MT-W SERIES



Bridge Type

Multi-Milling-Turning

Machining Center ▶▶▶▶▶



**WELE MECHATRONIC CO., LTD**

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

# 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  
4000rpm (Gear-driven)  
8000rpm (Built-in driven)  
12000rpm (Built-in driven)

### Automatic Head Exchange system:

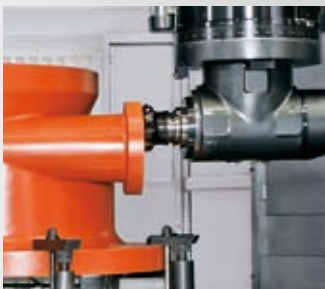
- Equipped with the protect cover, 90 degree head, and turning head. (STD)
- Provides the five-sides and turning functions.

### Automatic Tool Exchange system:

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



Turning head (STD)



90 degree head (STD)

### Turning & 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 indexing table (0.001 degree).
- Uses the dual servo Tandem control system to enhance the high torque transmission and to eliminate the backlash.
- Table size ø1.6m is for MT-16; ø2m is for MT-20.



MT series  
OnLine Spec.

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

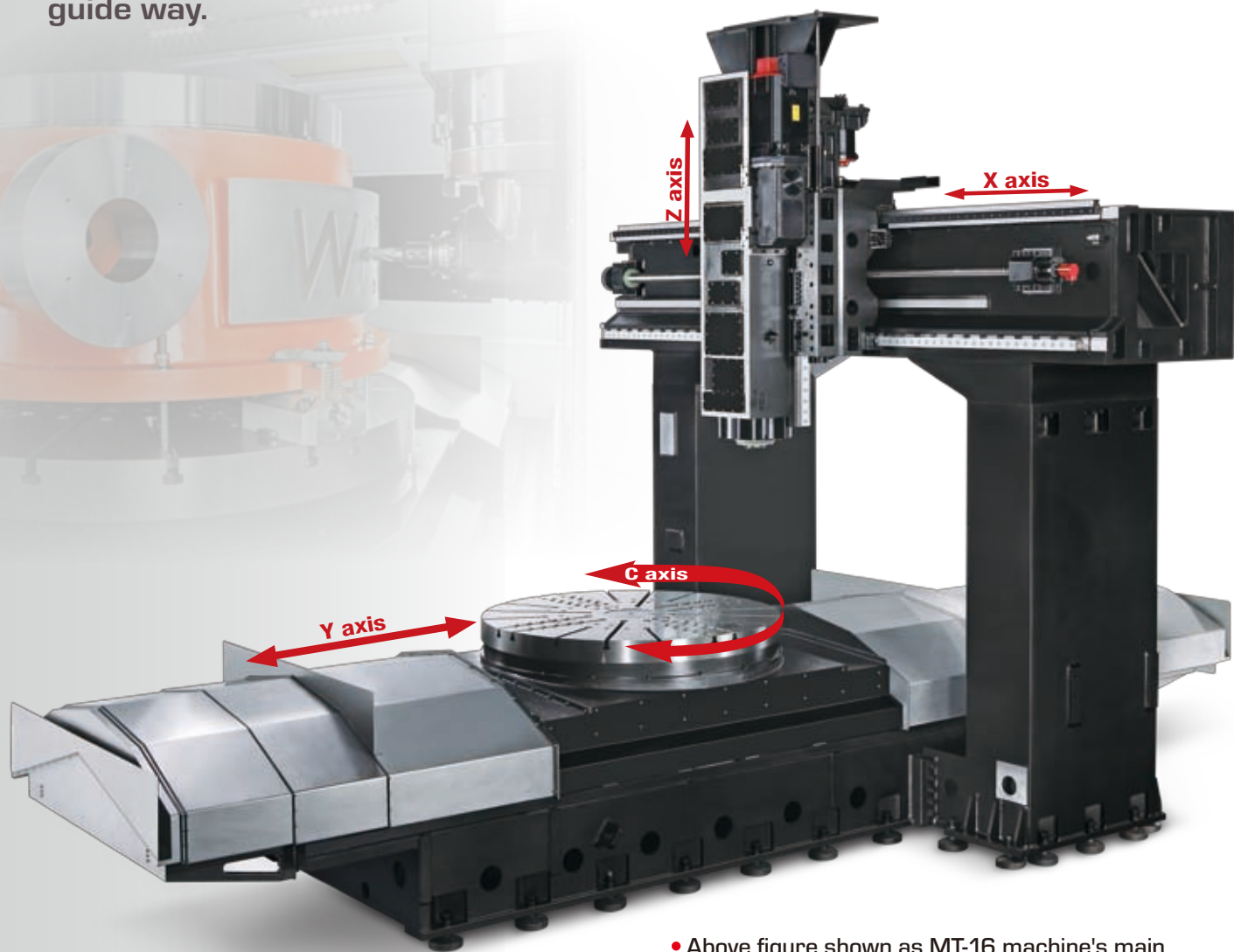


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# MT SERIES

## 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.



• Above figure shown as MT-16 machine's main structure without sheet metal.

## Fully Automatic Tool/ head exchange system (for MT-16/20)



• 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.



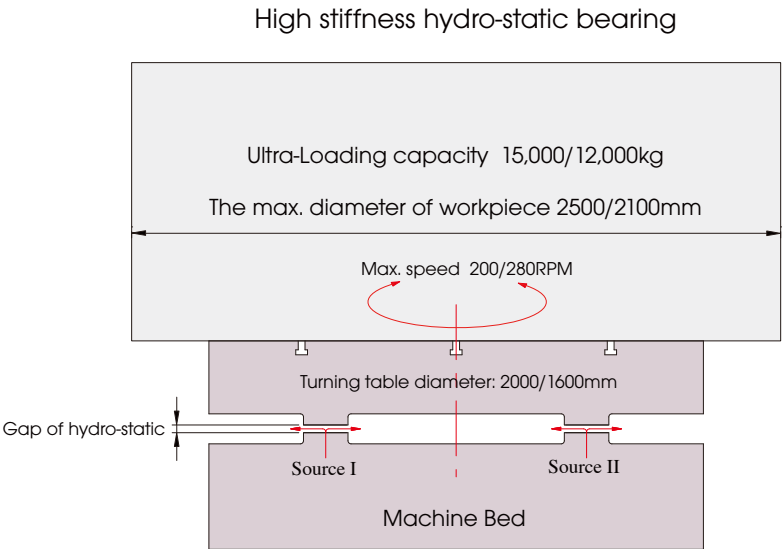
• Automatic turning tool holder exchange.



MT-16	MT-20	AA65 Series	AA80 Series	AA90 Series	AQ Series	VQ Series	UG Series	UA Series	VTC Series	
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## Features of the Turning & Indexing Table

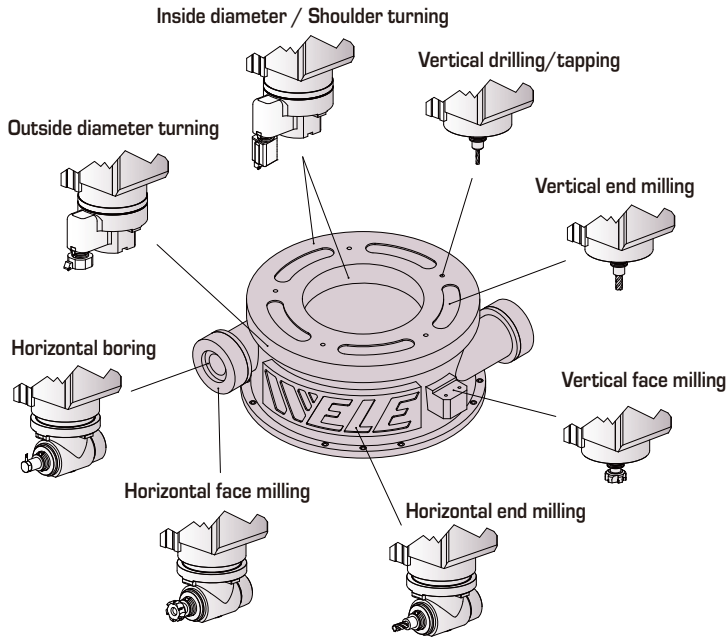
- WELE own developed turning & indexing table which is adapted with the hydro-static bearing for the ultra-heavy loading and cutting force.
- Dual servo driven Tandem control system attached on the turning & indexing table, not only to eliminate the backlash, but also to provides the cutting torque. 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)



## Various attach heads

Two speeds geared transmission box adoption can successfully ensure ultra heavy-duty and combined rough machining jobs. Several optional direct-driven spindles are also available for light alloy material or high speed machining requirements.



90° Head



Extension Head



30° Head



Universal Head

Type	90° Head	Extension Head	30° Head	Universal Head
<b>Specification</b>				
Spindle Taper	#50	#50	#50	#50
Sub Spindle Taper	BT50	BT50	BT50	BT50
Max. Tool diameter, mm(in)	215 (8.46)	215 (8.46)	215 (8.46)	215 (8.46)
Max. output torque, kW(HP)	15 (20)	18.5 (25)	15 (20)	15 (20)
Spindle speed, (rpm)	2,400	4,000	2,000	2,000
<b>Automatic indexing type attach head</b>				
Tool Clamp method	Automatic	Manual	Manual	Manual
Head exchange method	Automatic	Automatic (*1)	Automatic (*1)	Automatic (*1)
Index method	Auto C axis every 5° index	Not necessary	Auto C axis every 5° index	Auto C axis, manual A axis every 5° index.

\*1: Optional available for stationary round type head storage on MT-W series



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# MT-W SERIES

## Milling and Turning Machining Center with moving cross-rail function

- All in one design concept to save expense, setting time, and space requirement.
- Angular head storage along W axis any position: Automatic tool & head exchange available.
- Stationary round type head storage contains turning head and two optional stations.
- Provide various demands with vertical and horizontal milling and turning functions.
- Application : Oil & Gas, Aerospace, Mining, and Transportation industries.



- Above figure is MT-16W machine with full enclosure guarding and some optional accessories.

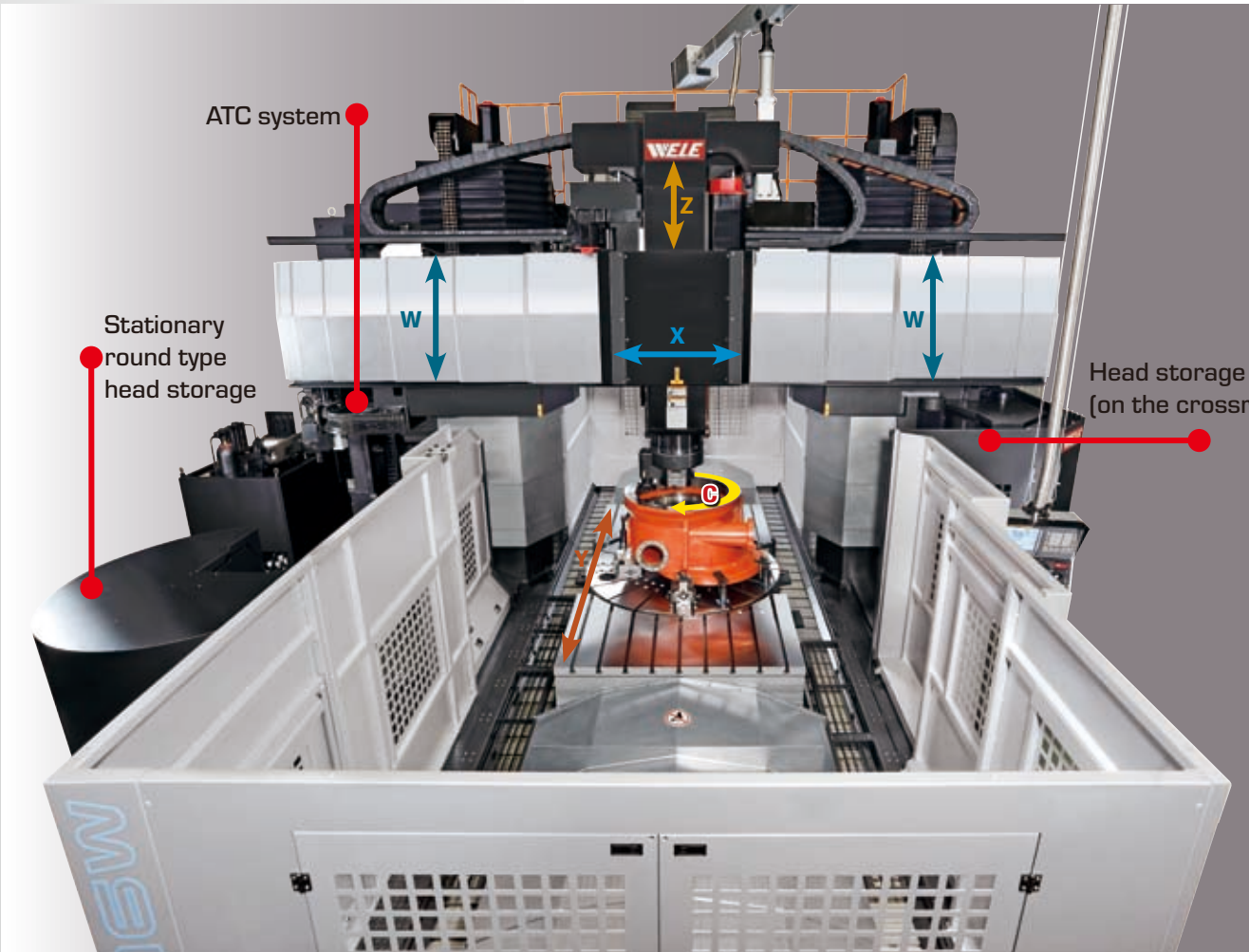


MT-W  
OnLine Spec.



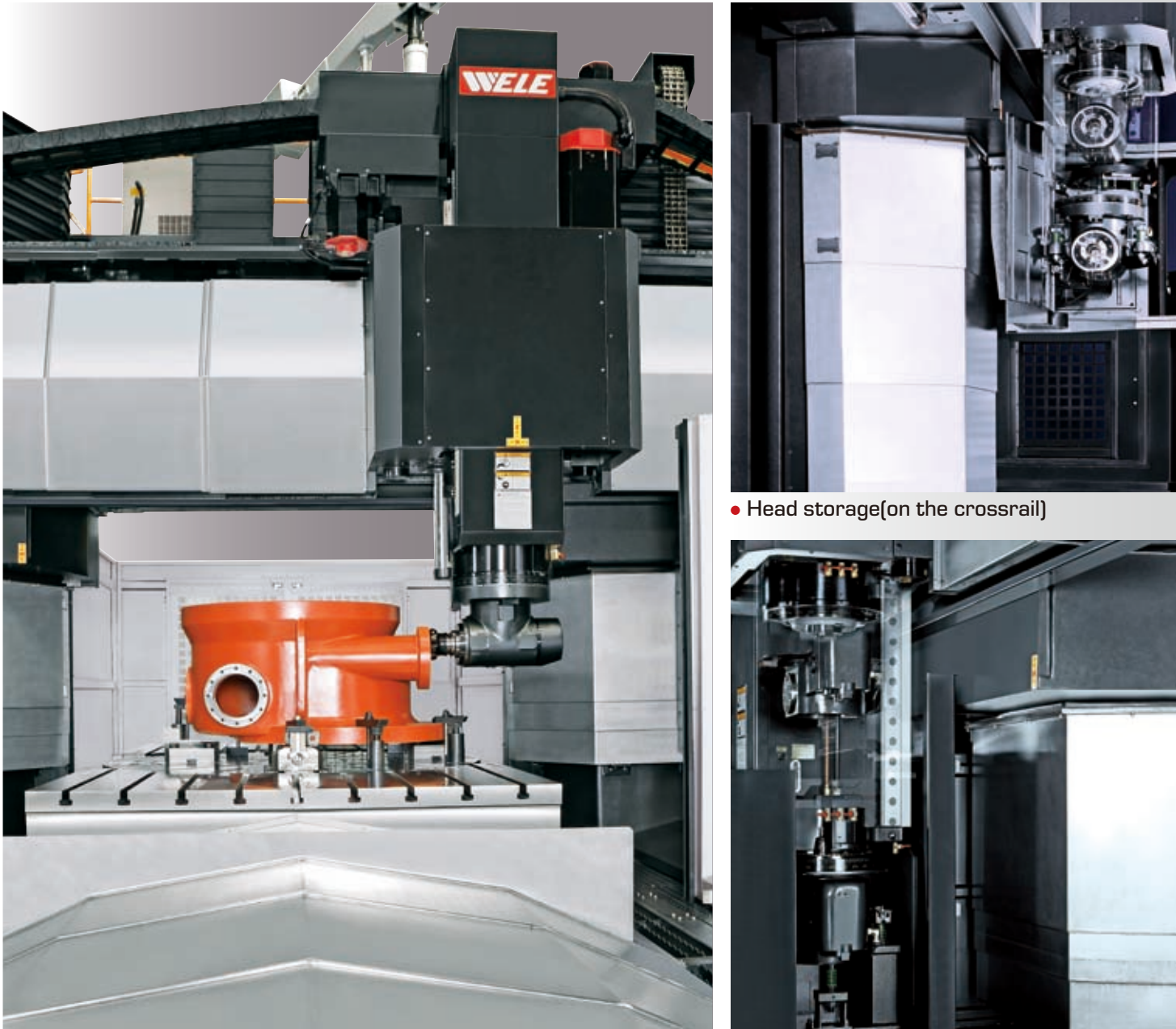
# MT-W SERIES

## Wider and Larger Machining Capacity

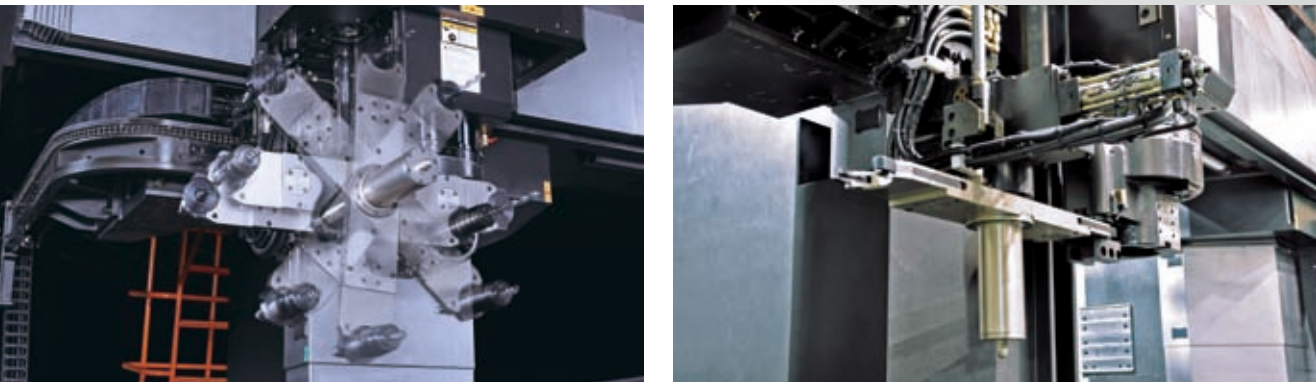


Travel	Unit	MT-16W	MT-20W
X axis travel (Vertical spindle forward & reverse movement)	mm (in)	2,800 (110.2)	3,200 (126.0)
Y axis travel (Turning table left & right movement)	mm (in)	3,060 (120.5)	3,500 (137.8)
Z axis travel (Vertical spindle up & down movement)	mm (in)	800 (31.4)	
W axis travel (Cross rail up & down movement)	mm (in)	1,000 (39.4)	
C axis travel (Table rotating)	degree	+/- 360	
Work Table capacity			
Table size	mm (in)	3,000x1,600 (118.1x62.9)	3,400x2,000 (133.8x78.7)
Turning table diameter	mm (in)	1,600 (62.9)	2,000 (78.7)
Max. Table load	kg (lb)	12,000 (26400)	15,000 (33000)

## Auto Head Exchange system (for MT-W series)



## ATC system (for MT-W series)

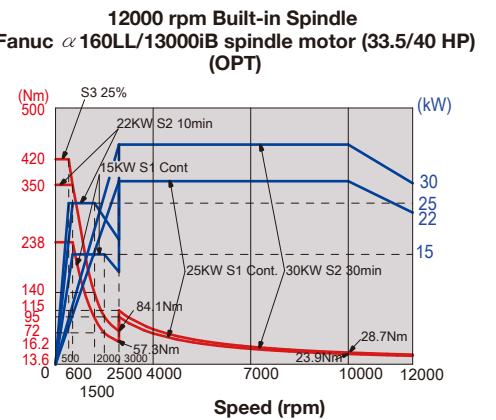
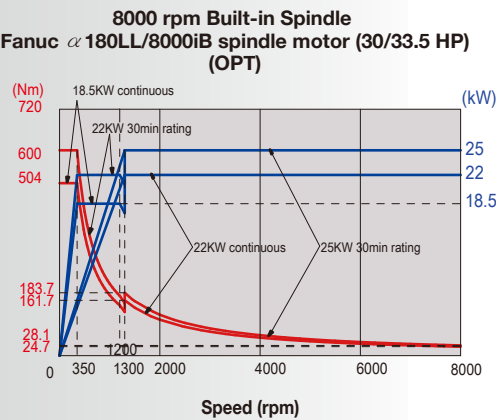
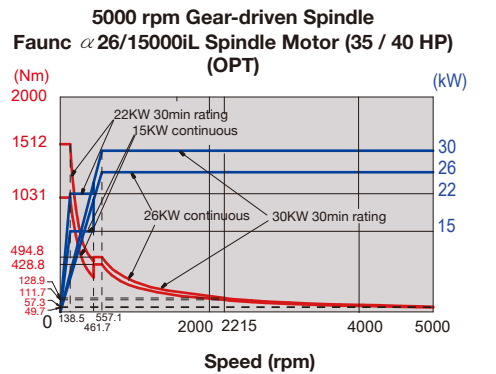
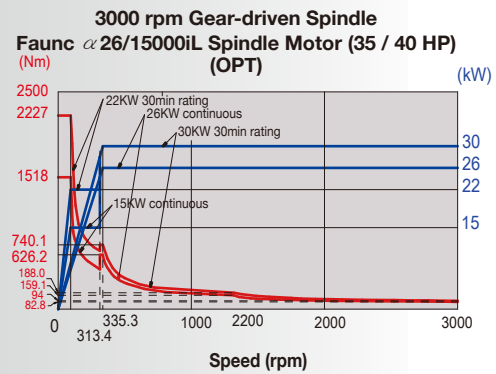
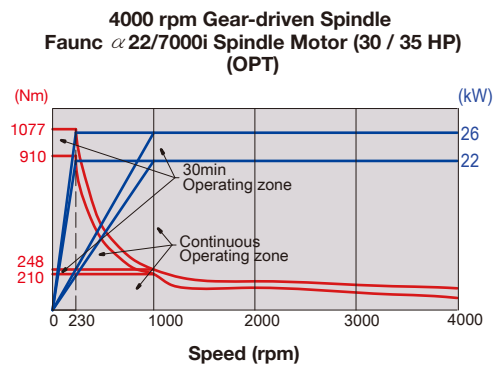
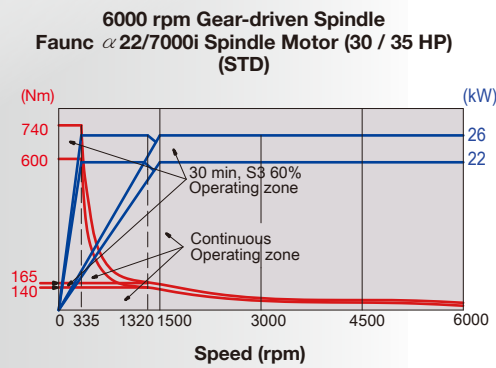




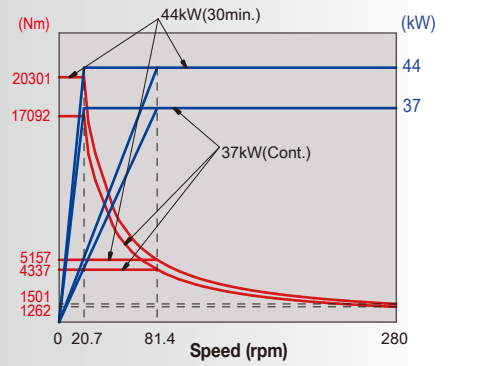
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Spindle Output Torque Chart

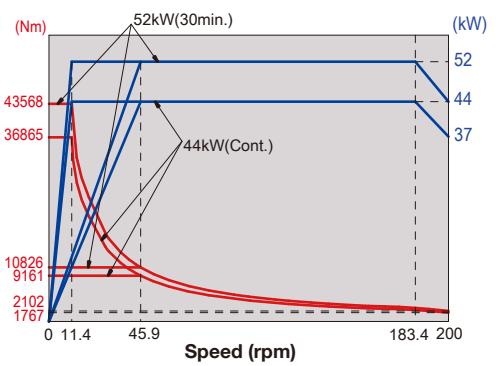
Vertical Spindle



Turning Spindle



Low gear ratio : 72.5    High gear ratio : 18.4  
MT-16(W) turning table

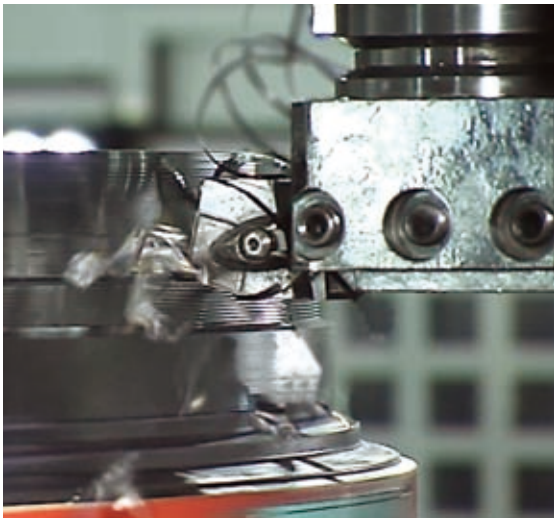


Low gear ratio : 131.6    High gear ratio : 32.7  
MT-20(W) turning table

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

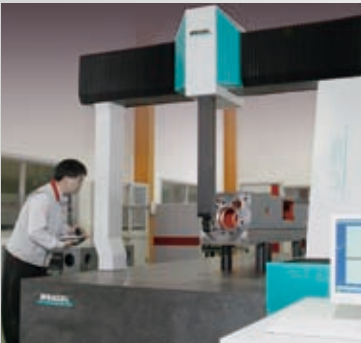


Milling spindle power	22/26kW
Milling tool	Φ 40x4 teeth
Cutting width (Ae)	8 mm
Cutting depth (Ap)	32 mm
Feedrate (f)	2,150 mm/min
Mass Removal rate (MRR)	550.4 cc/min

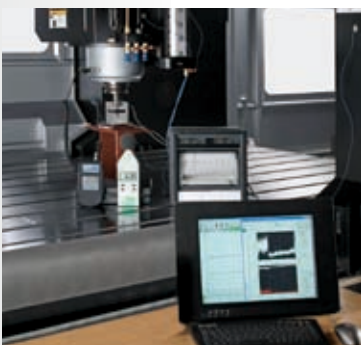
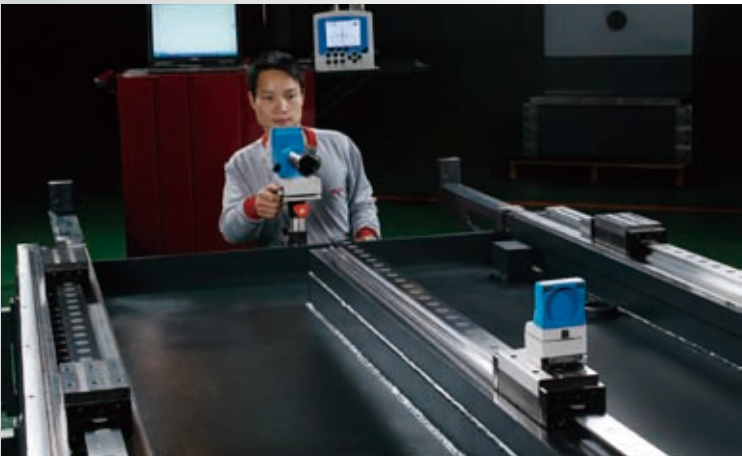


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# Genius Design and Experienced Technology



# Strictly Quality Assurance



# Leading and Reliable Electrical Technology

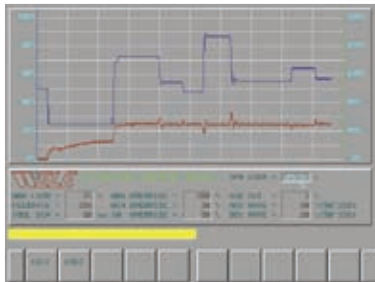
- Friendly operator control panel.
- On AUTO mode, execute tool exchange at magazine side.
- Prevent over travel (OT) error in operation
- High efficiency heat exchanger to cooling the electrical cabinet
- UL wiring and CE certification are optional available.
- Centralize automatic lubricating system 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



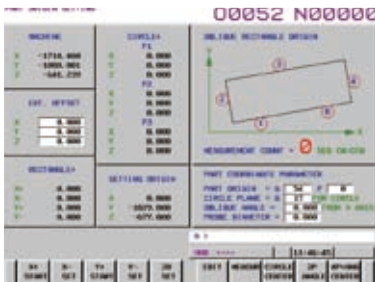
**Thermal Compensation Mode (TCM - Option)**  
Environmental and machining temperature can bring the caused the machine deformation. An unique technology of thermal compensation function can be reduced the machine error correctly.



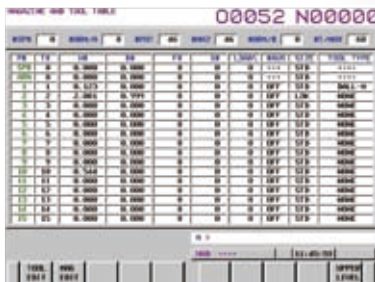
**Feed Adaptive Control (FAC)**  
To provide the customer increase their working efficiency. We called it FAC (Feed Adaptive Control). It does not need any adjustment the machine can reach a perfect cutting condition while the machine in operation.



**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.



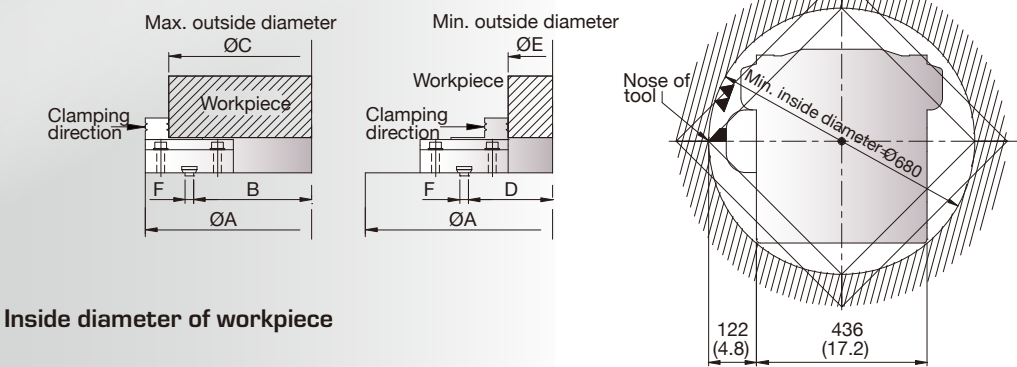
**Optimum Contour Cutting Parameter (OCCP)**  
WELE own developed the unique optimized cutting condition software which can be adjusting the cutting condition automatically according to the machine response presently. When the machine is using for a while, the optimized cutting condition software can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



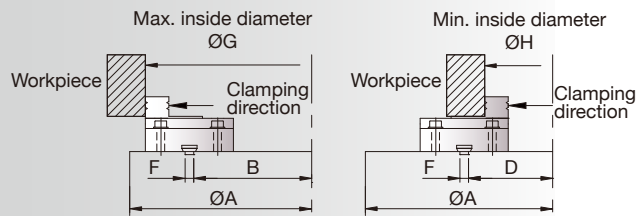
<b>MT-16</b>	<b>MT-20</b>	AA65 Series	AA80 Series	AA90 Series	AQ Series	VQ Series	UG Series	UA Series	VTC Series	
<b>MT-16W</b>	<b>MT-20W</b>	RB Series	SB Series	LB Series	MB Series	HB Series	UB Series	MG Series	MVB Series	<b>MT series</b>

Working Envelope Dimensions for Clamping

Outside diameter of workpiece



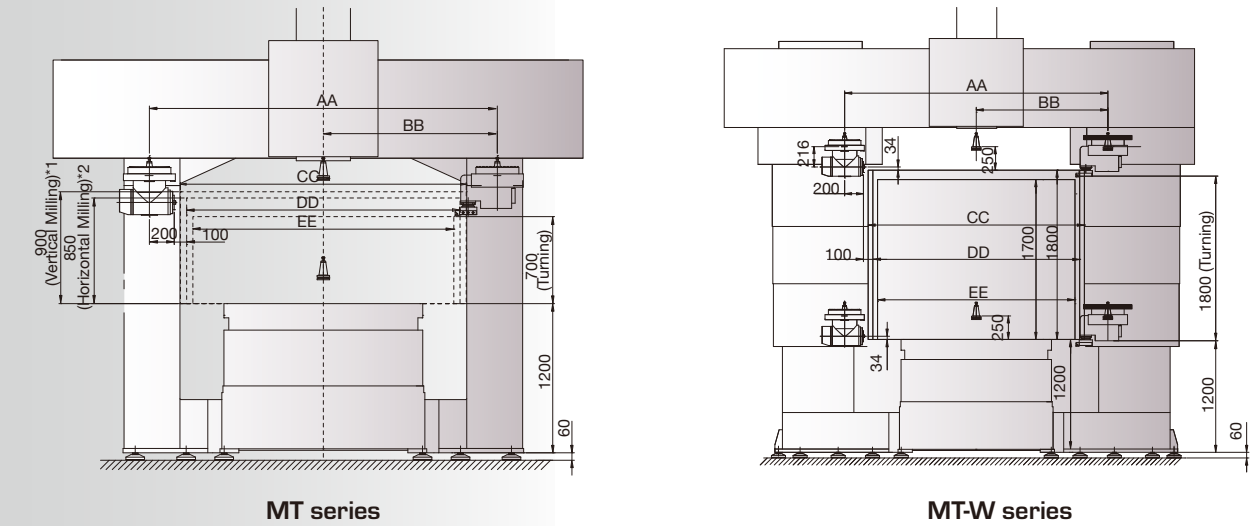
Inside diameter of workpiece



Unit : mm(inch)

Item Model	A	B	C	D	E	F	G	H
MT-16	1,600 (63)	695 (27.4)	1,521 (59.9)	335 (13.2)	462 (18.2)	22 (0.9)	1,641 (64.6)	582 (22.9)
MT-20	2,000 (78.7)	901 (35.5)	1,933 (76.1)	316 (12.4)	424 (16.7)	22 (0.9)	2,053 (80.8)	544 (21.4)

Working Envelope Dimensions

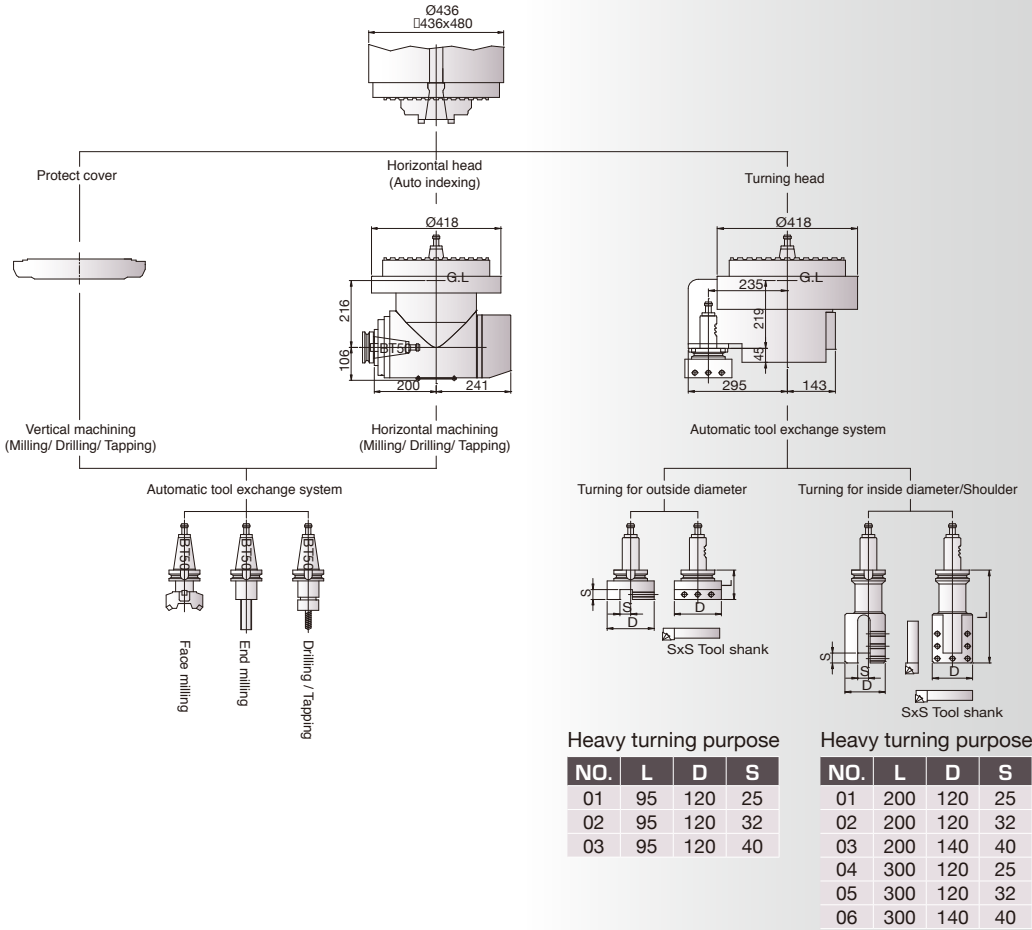


Unit : mm(inch)

Item Model	X travel AA	BB	Max. width For Vertical Milling CC	Max. width For Horizontal Milling DD	Max. diameter For Turning EE
MT-16/ MT-16W	2,800 (110.2)	1,400 (55.1)	2,300 (90.6)	2,200 (86.6)	2,100 (82.7)
MT-20/ MT-20W	3,200 (126)	1,600 (63)	2,700 (106.3)	2,600 (102.4)	2,500 (98.4)

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

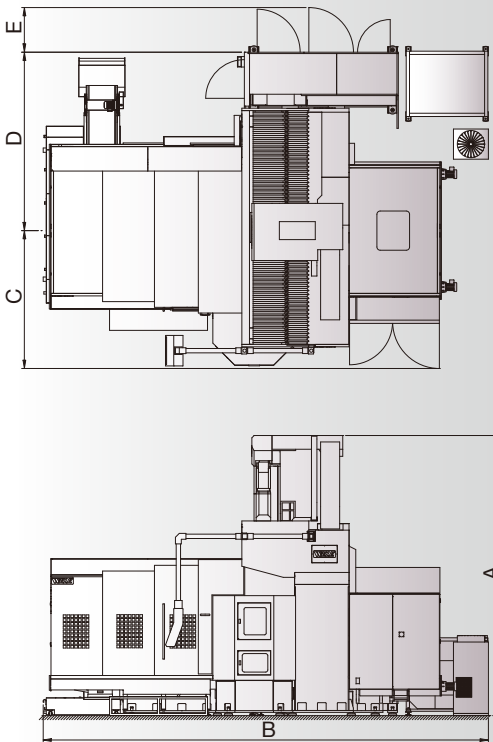
Spindle Configuration



Machine Dimensions and Space Requirement

Unit : mm(inch)

Model	A	B	C	D	E
MT-16	4,600 (181)	8,200 (323)	2,550 (100)	3,300 (130)	820 (32)
MT-20		9,200 (362)	2,750 (108)	3,500 (138)	
MT-16W	6,000 (236)	9,900 (390)	3,068 (121)	4,490 (177)	765 (30)
MT-20W		10,990 (433)	3,268 (129)	4,690 (185)	





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Technical specifications

Specification	Unit	MT-16/MT-16W	MT-20/MT-20W
Machining capacity			
X axis travel (Spindle forward & reverse movement)	mm(in)	2,800 (110.2)	3,200 (126.0)
Y axis travel (Turning table left & right movement)	mm(in)	MT-16: 2,600 (102.4) MT-16W: 3,060 (120.4)	MT-20: 3,000 (118.1) MT-20W: 4,000 (157.4)
Z axis travel (Spindle up & down movement)	mm(in)	800 (31.5)	
W axis travel (Crossrail up & down movement)	mm(in)	1,000 (39.4) only for MT-W	
Table diameter	mm(in)	1,600 (63.0)	2,000 (78.7)
Max. turning height	mm(in)	MT : 700 (27.6) MT-W: 1,700 (66.9)	
Max. swing diameter	mm(in)	2,100 (82.7)	2,500 (98.4)
Distance between columns	mm(in)	2,308 (90.9)	2,708 (106.6)
Distance between vertical spindle nose to table	mm(in)	MT : 230-1030 (9.1-40.6) MT-W: 250-2050 (9.8-80.7)	
Distance between angular head center line to table	mm(in)	MT : 15-815 (0.6-32.0) MT-W: 15-1815 (0.6-71.4)	
Distance between turning tool face to table	mm(in)	MT : 10-810 (0.4-31.9) MT-W: 10-1810 (0.6-71.2)	
Milling spindle unit			
Spindle motor	kW(HP)	22/26 (30/35)	
Vertical/ Horizontal spindle speed	rpm	10-6,000 / 10-2,400	
Spindle output torque (cont. / 30min rating)	Nm (ft-lb)	620/740 (460/545)	
Spindle taper		BBT#50	
Turning & Indexing table unit			
Turning table motor	kW(HP)	37/44 (50/60)	44/52 (60/70)
Turning table speed	rpm	10-280	10-200
Turning table output torque (cont. / 30min rating)	Nm (ft-lb)	17,000/ 20,300 (12,500/ 14,960)	36,800/ 43,500 (27,000/ 32,000)
Turning table loading	kg(lb)	12,000 (2,6400)	15,000 (33,000)
Feedrate			
X/Y axis rapid feedrate	mm(in)/min	15,000/20,000 (590.6/787.4)	15,000/18,000 (590.6/708.7)
Z/W axis rapid feedrate	mm(in)/min	15,000 (590.6)/ 3,000 (118.1)	
X/Y/Z/W axis cutting feedrate	mm(in)/min	1-10,000 (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)	
Turning tool section size	mm(in)	□32x32 (1.26x1.26)	
Accuracy			
Positioning accuracy on feed axes (VDI, P)	mm(in)	P=0.02 (0.007)/full stroke	
Repeatability accuracy on feed axes (VDI, Ps mean)	mm(in)	Ps=0.015 (0.002)	
C axis positioning accuracy (VDI, P)	arcsec	30	
C axis repeatability accuracy (VDI, Ps mean)	arcsec	15	
Power requirement and others			
Power requirement (220V +/- 10% , 3 phase, 50/60 Hz)	kVA	75	
Pneumatic requirement	kg/cm <sup>2</sup>	5	

\*\*Product specifications and accessories are subject to change without notice.  
\*\*Specially order are also available on request.  
\*\* Above specifications shown as related W axis which only for MT-16W & MT-20W.

Standard and optional accessories

● : Standard    ○ : Option    X : Not available

Item	Model	MT series	MT-W series
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 : 8000 rpm built-in spindle (30/33.5HP), BT#50		○	○
Vertical Spindle : 12000 rpm built-in spindle (33.5/40HP), BT#40		○	○
4 jaws manual chuck		●	●
Adjustable torque limit clutch on X, Y, Z axis		●	● (Incl. W 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 and Pneumatic system		●	●
Centralized guide ways lubrication system		●	●
Coolant system and tank with 750 liter capacity		●	●
Coolant through the tool adapter		○	○
Coolant through the spindle (Form A) w/extra 1000 liter tank		○	○
Full splash guarding system		●	●
Roof enclosure guarding system		○	X
Fully automatic tool exchange system (Vertical, Horizontal, and Turning tools)		●	●
Fully automatic head exchange system (Horizontal head/ Turning 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/ Heidenhain)		○	○: X, Y, Z axes ●: W axis (Fargo)
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)		●	X
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		●	●

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