Matsuura

5-Axis Vertical Machining Center

MX-520

PC4

MAXIA
Innovation by Matsuura

Matsuura

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- Product specifications and dimensions are subject to change without prior notice.
- The photos may show optional accessories.

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MX Series

Matsuura's Globally Best Selling "5-Axis + Multi-pallet" thoroughly covering all key customer needs

"Safe and Easy 5-Axis Machining"

MX Series

A 5-axis entry-level machine with ease of use and automation features.

Matsuura hand-built 5-axis quality; exceptional performance, low cost of ownership & assured residual value.

Achieve stable machining accuracy while ensuring excellent operability, such as accessibility to the work envelope and ease of setup.

MX-520

MX-330 — MX-420 — MX-520 — MX-850

MX Series Line-up

Series

Further Evolved, on Ease of Use and Automation

Featuring the latest technological developments based on the Matsuura Slogan: "The Reason to be Chosen"

Advanced MIMS

Equipped with optimal functions developed based on real customer testimonials, addressing challenges of automated and unmanned operation.

Improve productivity and save on labor with safe and reliable extended unmanned operation.

The 5 Matsuura Intelligent Meisters

1 Productivity Meister — **Automation**

Improve Productivity in the face of Staffing Issues with Extended Unmanned Operation

- Extended unmanned operation support

2 Operability Meister — **Simple**

Fuss-free Simple Operation, Increased Work Efficiency

- Intuitive operability
- Simple & secure scheduling
- Reduced operator's burden
- Visualized machine operation status

MiOS 4

3 Performance Meister — **Accuracy**

Show Consistent Excellent Performance, Increased Machining Efficiency

- Stabilization of machining accuracy
- Cycle time reduction
- Reduced machining error

4 Reliability Meister — **Secure**

Reduction of Machine Downtime, Extended Stable Operation

- Reduced machine recovery time
- Reduced error-related downtime
- Resolved chip management issue

5 ECO Meister — **Environment**

Power Saving, Reduced Environmental Burden & Operation Cost

- Reduced power consumption
- Visualized power consumption

1 Productivity Meister

Automation

Improve Productivity in the face of Staffing Issues with Extended Unmanned Operation

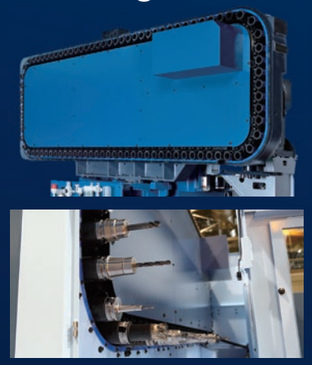
Capable of 24 hours continuous operation - Simple automation

The ***MX-520*** comes 4 pallet system and 90 tool option, offering superb profit enhancing lights out production while utilizing minimal floorspace.

PC4 (Floor pallet system) Option

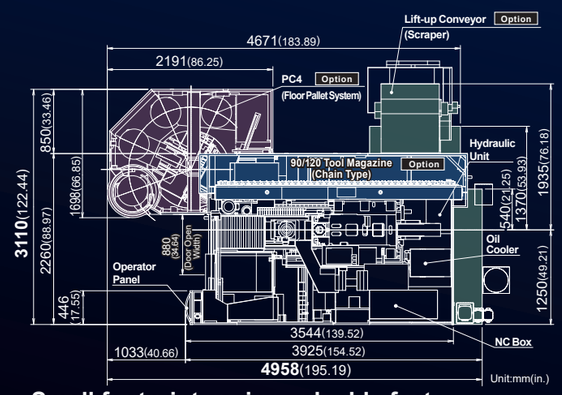
Pallet storage: Memory random system

90-tool magazine Option



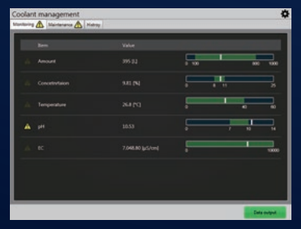
PC4 Work station (rotary) Option

Assisting set-up by rotating the workstation by 90 degree increments.



Small footprint saving valuable factory space

Coolant management system Option



Prevents production halts caused by coolant shortage and reduces coolant replenishment work by automatically monitoring the coolant condition (level, concentration, temperature, pH, electrical conductivity) to allow for extended unmanned operation.

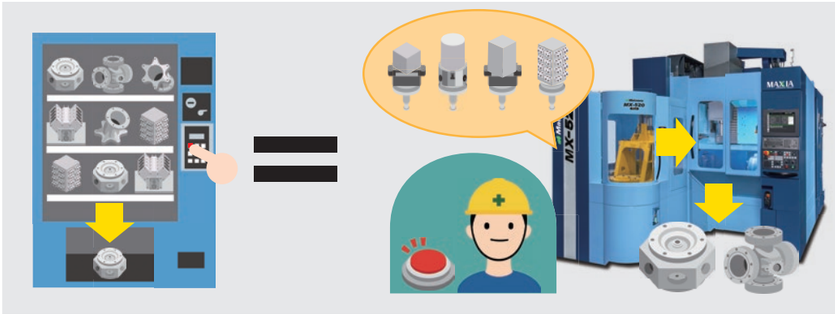
Visualizing coolant conditions also helps you improve machined surface quality, tool wear, and reduce maintenance time.

* Only available for water-soluble coolant
* Industrial water arranged by customer.
*The coolant management system requires the operation status monitoring option (one year data storage capacity expansion).

Matsuura Original Muti-pallet System Solution

High-Mix, Low-Volume Production

Matsuura's class leading multi-pallet solutions allow you to leave fixtures for recurring jobs on specified pallets, enabling you to respond quickly to customer requests, producing the required parts as required – much "like a vending machine".

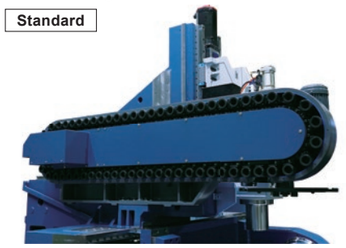


Scan me and watch!

Tool specification

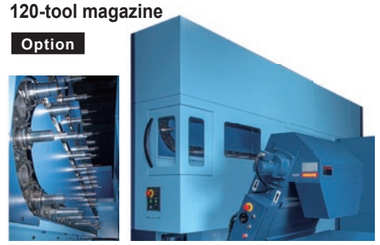
60-tool magazine

Standard



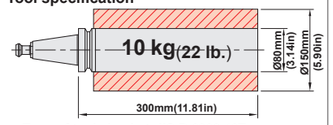
120-tool magazine

Option



Floor plan is the same as 90-tool magazine

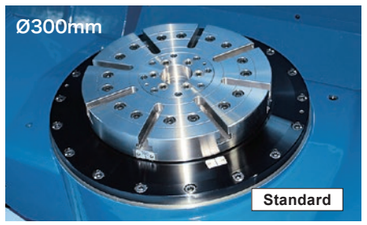
Tool specification

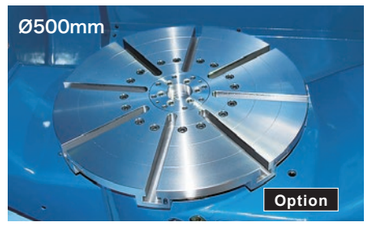


Type of tool shank	:	JIS B 6339 40T
Max. tool diameter	:	Ø80 mm (Ø3.14 in.) with adjacent tools Ø150 mm (Ø5.90 in.) without adjacent tools
*Storage pocket is limited for large diameter tools		
Max. tool length	:	300 mm (11.81 in.)
Max. tool mass	:	10kg (22 lb.)

Table specification

Utilizing 3-axis machining knowhow is possible even during the transition to 5-axis machining





Automation with a robot

Interface for connection with external work transfer equipment.

▶Robot interface Option

Supports automation with a robot system.
3 types of "FOCAS only", "FOCAS+I/O", and "ETHERNET/IP ADAPTER" available for various types of robots.

▶Automatic door Option

Automatically opens and closes the operator door.

▶Pressure supply system to fixtures Option

Equipped with pressure supply ports for through-pallet system fixtures. Supplies pressure to the auto clamping device and makes it possible to utilize an external workpiece transfer system.

*Requirements and restrictions differ depending on table/pallet, hydraulic pressure/pneumatic pressure/vacuum.

2 Operability Meister **Simple**

Fuss-free Simple Operation, Increased Work Efficiency

Intuitive Operability for Secure and Reliable Unmanned Operation

MiOS 4 NEW

New Operating System
Matsuura Integrated Operating System

The newest update of the user interface, the first in 10 years, offers intuitive operability regardless of operator experience. The improved icon layout provides easier workflow, and the larger main screen improves visibility by displaying important information at all times.

The home screen displays all necessary information for automatic operation

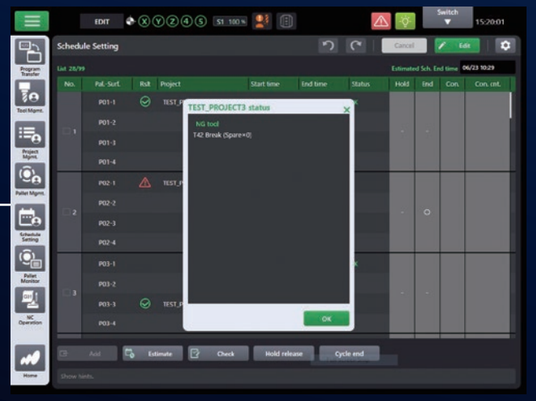
Machining schedule, machining progress (start/end time display), tool life, machining program and tool management pre check are all displayed on the main screen. Machine status can be seen at a glance, facilitating secure and reliable unmanned operation.

Home screen

Precheck function to notify missing setups

Set up support function to send notifications in event of a program setting error and tool shortage, ensuring secure schedule operation with reduced setup error and operator burden.

You can check the completion time of the work by displaying machining start and completion time. Easier schedule setting to meet the delivery of machined parts.



Schedule setting screen

Switch layout with easy-to-follow operations

To facilitate screen switching required from setup work to schedule operation, the side menu displays related switches according to the order of work.

Reduces screen switching time by always displaying frequently used switches.

Program Preparation
▼
Tool preparation
▼
Workpiece preparation (pallet and schedule set-up)
▼
Programmed operation

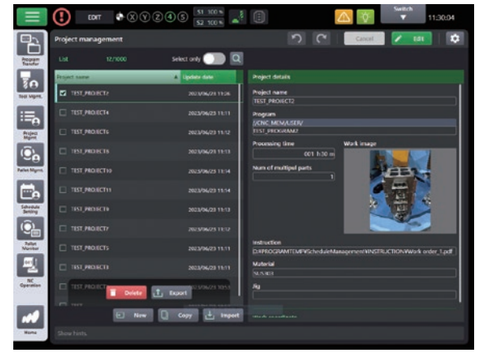
*Switch layout can be customized.

Project management function

Unitary control of machining data(machining program, material / fixture / image data, work coordinate data, setup instruction data) as project file (***up to 1000data***). Easy and secure data transfer between machines with data input/output function, preventing delivery delays due to machine setup time or machine stops caused by human errors in schedule setups. Enables easy and reliable night/weekend unmanned operation.

Large capacity memory (16GB) Option

To support high-mix low-volume production and extended operation, program capacity has been increased to 16GB. Enables management of larger programs without stress by increasing program transfer speed.



Project management screen
* Image is for illustrative purposes.

User friendly tool management screen

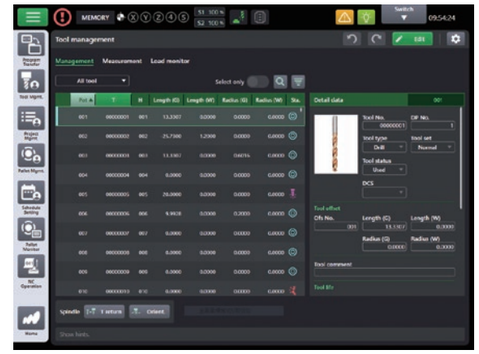
Equipped with tool life management as standard, the unmanned capability of the machine is enhanced.

- ▶By creating tool lists you can check and search specific tool data.
- ▶With the load / unload function you can store tool data on a temporary basis.

Tool pre-check function

- ▶Confirms tools are available before machining begins.
- ▶Prevents alarms and unplanned stops during unmanned operation.

* Installed as standard with multi-pallet system



Tool management screen

Easy pallet management and scheduling

Continuous operation is made possible by setting all necessary information into the schedule table. Order or priority of machining can be easily changed to meet production requirements. Pallet reserve, interrupt, priority and repeat can be set for each pallet. After setting a project in a palette on the pallet management screen, you can create a schedule on the schedule setting screen.

Schedule operation	Machine according to the numbers on the schedule setting screen
Interrupt setting	Give top priority to urgent parts and interrupt in the preset schedule
Reserve setting	Set up pallets during the daytime for unmanned machining at night time
Continue setting	Repeat the specified schedule continuously
End setting	Finish the automatic operation when the machining on an “end” schedule is completed

Pallet management screen

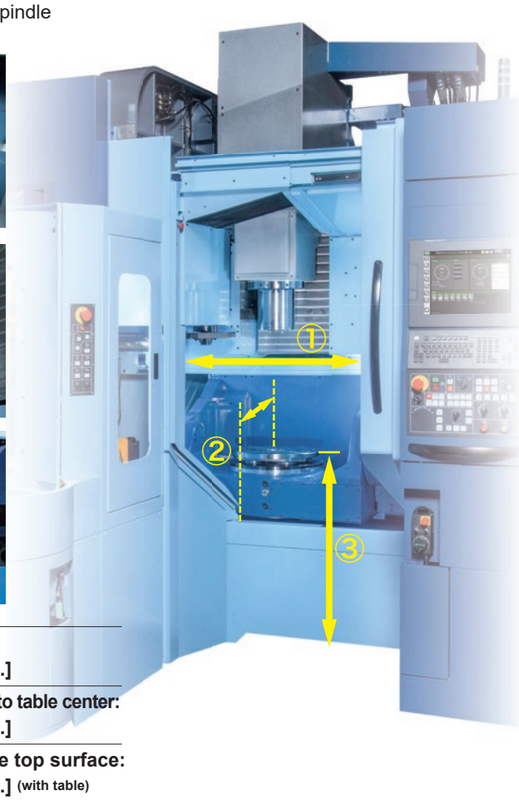
Schedule setting screen

Pallet monitoring screen

Reduced Operator's Burden

Designed for sustained performance

Accessibility to workpiece and spindle



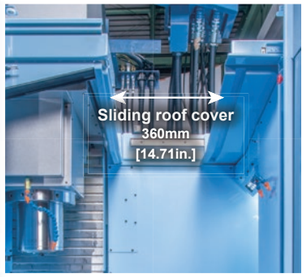
① Front door opening width:
800mm [31.49in.]

② Distance from machine front to table center:
385mm [15.15in.]

③ Distance from floor to table top surface:
850mm [33.46in.] (with table)
870mm [34.25in.] (with pallet)

Designed for easy crane access

A sliding roof cover, incorporating a proven Matsuura design, affords the operator a spacious 360mm roof opening for loading billets safety by crane.



Designed for easy maintenance

Improved work efficiency by layout daily maintenance devices centrally in one place.

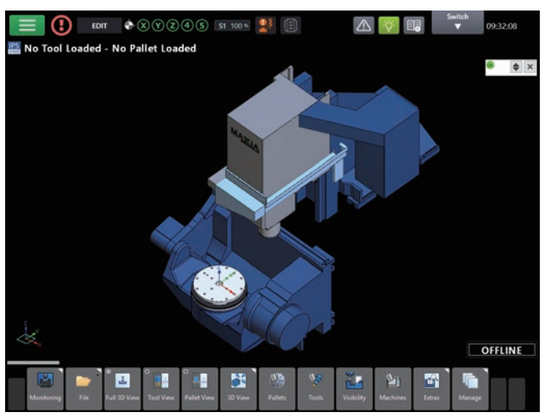
Intelligent Protection System

Collision prevention function Standard

The collision prevention function is developed specially by Matsuura. It prevents machine collisions due to programming errors in automatic operation, and also prevents human error in advance during manual operation and workpiece setup.

* With ***Intelligent Protection System***, interference check is available during cutting simulation.
* The ***Intelligent Protection System*** simulates your programming components (tools, workpiece, fixtures, etc.) that match the machine model, alerting you to any possible interference or collision before actual machining takes place.
* Model editing tool for model creation on an external PC is available. Model data of stock, tools, etc. can be created in a single software.

Previously required an external PC.
Now installed to the NC screen as standard



Visual Management for Machines

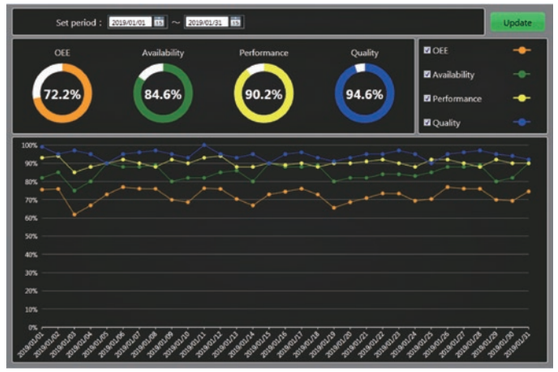
Operation status monitoring Standard

Machine availability and performance can be monitored to improve process planning.

- ▶Performance is monitored to check OEE.
- ▶Data can be output to process data acquisition (PDA) systems.

* Overall equipment efficiency (OEE) = availability x performance x quality
* The storage period is one month. Upgrade to one year of data storage is optional.

Operational state display

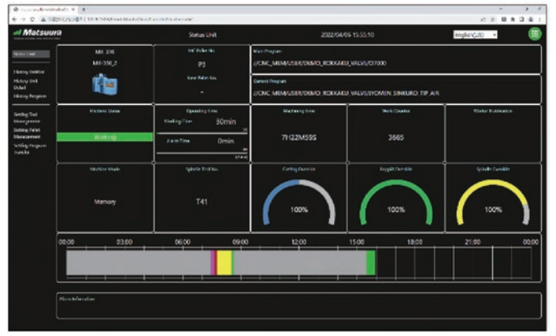


Overall operation ratio display

Matsuura remote monitoring system Option

- ▶Monitor the operating status of multiple machines, even while off site.
- ▶Check machine operation history (machines can be displayed collectively or individually).
- ▶Edit the pallet schedule, even when away from the machine.

Multiple machines operating status



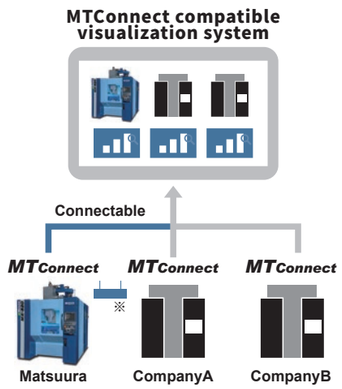
Individual machine operating status

MTConnect/OPC UA Option

MTConnect/OPC UA is an open communication protocol for the manufacturing industry. MTConnect/OPC UA enables low-cost visualization and oversight of all CNC machines in a factory, regardless of the machine manufacturer. Benefits include;

- ▶Optimization of production schedule
- ▶Identify and utilize free machine time
- ▶Early detection of abnormalities

* Support for both wireless and wired LANs



3 Performance Meister

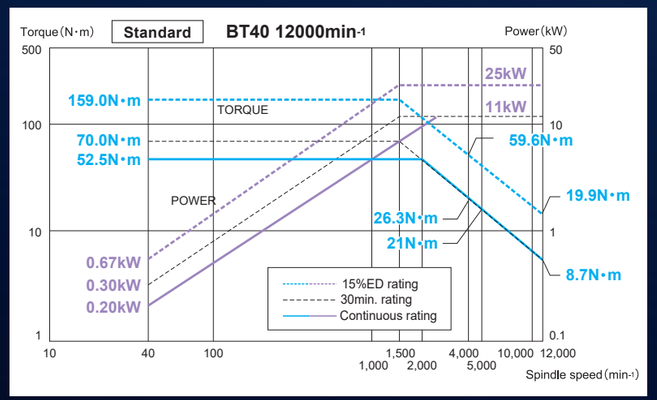
Accuracy

Show Consistent Excellent Performance, Increased Machining Efficiency

High-rigidity, high-precision MAXIA BT40 Spindle

MAXIA Spindles – designed and built only by Matsuura, deliver maximum performance, accuracy and longevity of service for many, many years - even when continuously machining hard-to-cut materials. High torque, heavy duty and high speed are assured across the range of spindle options from Matsuura.

- Built-in reliability with superior design and sustained spindle performance drawn from Matsuura's lengthy engineering heritage.
- From high - speed aluminum machining to pre-hardened steels; exceptional performance in all machining environments is assured.
- Matsuura controls every aspect of our Spindles creation; from design concept, to precision in-house component manufacture, to clean room assembly, to rigorous testing, to final installation & commission. Quality assurance & sustained Spindle performance – every time.
- Maintenance free Spindle technology; grease lubricated, low noise, environmentally friendly
- 80mm diameter bearing with excellent balance of high - speed rotation and reliability.

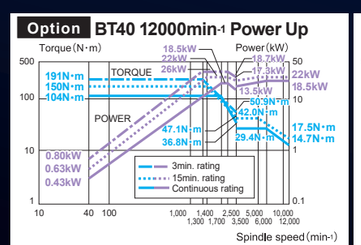


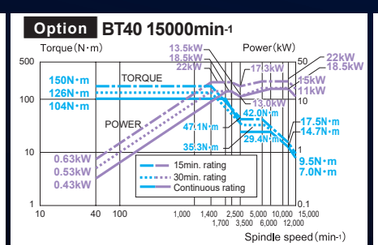
Machining test results

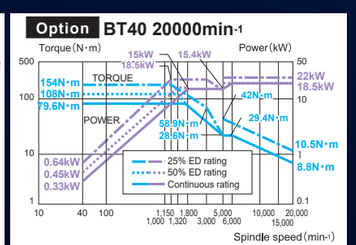
BT#40 12000min-1 (159N·m) **Standard**

	Part material	Tool size (mm)	Cutting width Cutting depth (mm)	Spindle speed (min-1)	Cutting feed rate (mm/min)	Cutting capacity (cc/min)
Face mill	A5052	Ø80 (3.14) 3blades	W=70(2.75) D=4(0.15)	5,500	4,000 (157.48)	1,120
	S45C	Ø80 (3.14) 5blades	W=70(2.75) D=3(0.11)	900	1,800 (70.86)	378
End mill	A5052	Ø25 (0.98) 2 blades	W=22(0.86) D=6(0.23)	12,000	7,000 (275.59)	924
	S45C	Ø20 (0.78) 4 blades	W=3(0.11) D=30(1.18)	5,000	3,000 (118.11)	270

	Part material	Tool size (mm)	Spindle speed (min-1)	Cutting feed rate (mm/min)	Cutting capacity (cc/min)
U Drill	A5052	Ø33 (1.29)	1,200	500 (19.68)	427
	S45C	Ø33 (1.29)	1,200	220 (8.66)	188
Tap	A5052	M30×P3.5	120	420 (16.53)	-
	S45C	M24×P3.0	100	300 (11.81)	-





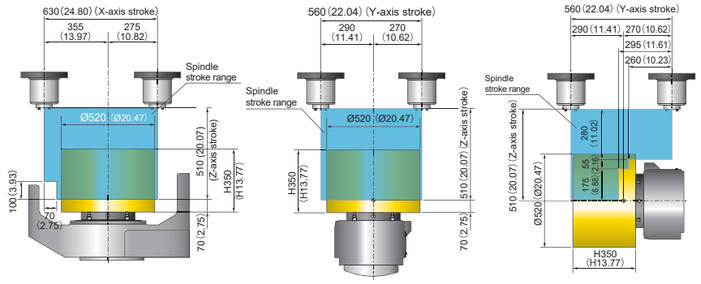


Lower costs, fewer set-ups, and eliminate accumulated load errors with 5-axis machining

Specially designed 4th-/5th-axis table. The headstock & trunnion configuration has been designed in such a way as to minimize the possibility of collision, whilst maximizing tool access & reach.

Spindle Stroke Diagram (Table specification)

Unit : mm (in.)



* Table size: Ø300 mm (Ø11.81 in.), X-axis 0 to −560 mm (-22.04 in.)
* In an actual machine, the X-axis moves when the table moves.

Productivity improvement via cycle time reduction; acceleration of machine movement

The newly-designed ***MX-520*** achieved a cycle time reduction of 10% or more (compared to conventional model) by improving the 4/5 axis raid traverse rate to 33/50min-1 (conventional 17/33min-1) and machine movement performance.

[Material] Aluminum(147x120x60mm)[5.78x4.72x2.36in.]
[Number of tools] 12 tools
[Spindle speed] 2,000~12,000min-1

Cycle time	Conventional	New-designed
4/5 axis indexing	56min 00sec	49min 56sec
Simultaneous 5 axis	37min 08sec	32min 24sec
Total	93min 08sec	10% or more Reduction 82min 20sec

Data is not intended to guarantee the performance.

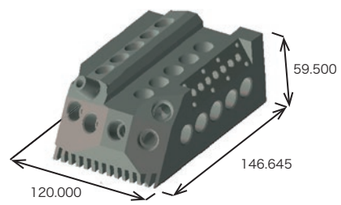


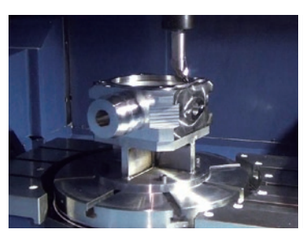
Fig. Cycle time comparison

Synchro Tip + Orbit machining Option

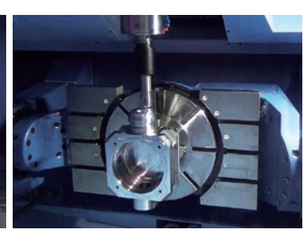
Patent No. 5883535

Simple turning function combining orbit machining and C-axis rotation

Turning processes can also be performed on this machining center by using a synchro tip. Since turning and machining can now be done in one, no additional setup time is required for the turning process.



* ***Synchro Tip***
(Orbit machining + C-axis rotation)



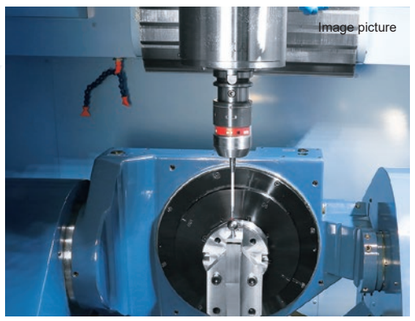
* Orbit machining

Thermal displacement compensation

Spindle Standard | Environment Option | Feed axes Option

The displacement compensation monitors the temperature of major machine components—such as the spindle, ball screws, bed or column—automatically calculates the amount of compensation, and feeds it back to the NC controller.

* The feed axis thermal displacement compensation can be used on the machine without scale feedback specification.



eZ-5

eZ-5 Advanced 5-axis error measurement and correction Option

Geometric error correction is essential for multi-axis machine tools. eZ-5 completes measurement, using a touch probe and calibration sphere, in a mere 3 minutes. The high accuracy of the machine is maintained through quick and simple operations.

Auto measure calibration support NEW

Option

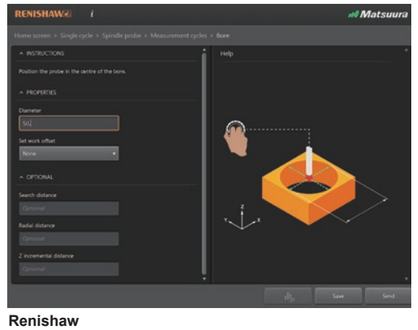
With the advanced calibration sphere (ACS-1), anyone can perform calibration easily and accurately and reduce calibration time.

ACS-1

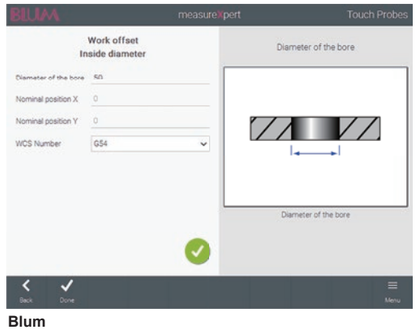
Automatic measurement (interactive) Option

Intuitive and user-friendly input support screens to guide operators through the process of automatic measurement and part setup.

* Automatic measurement (interactive) is available only when Renishaw macro or Blum macro is selected.



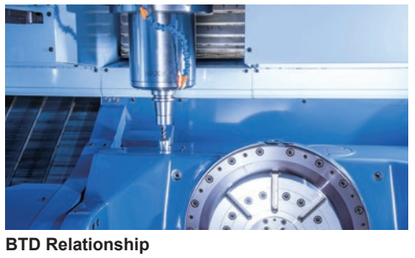
Renishaw



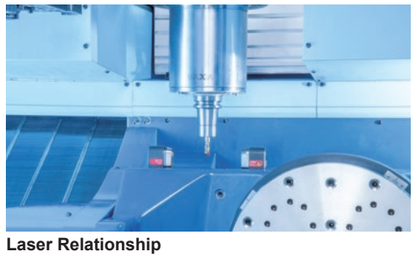
Blum

Tool breakage detection Option

Achieve higher accuracy and accuracy stability by improving measurement accuracy and reducing measurement error. Mechanical type and laser type (Renishaw and Blum) are available.



BTD Relationship

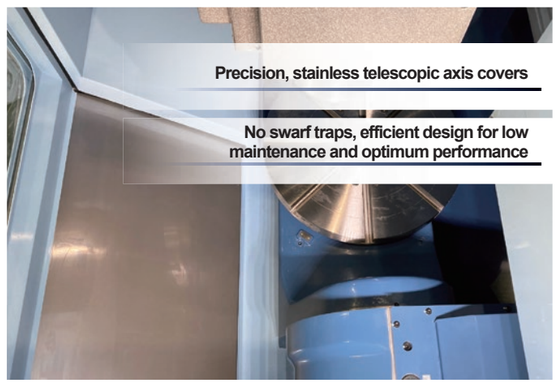


Laser Relationship

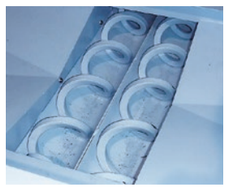
Reduction of Machine Downtime, Extended Stable Operation

Reliable chip removal

Chips are transported to the rear of the machine by the chip flow. By using the optional spiral chip conveyor and lift-up conveyor together, it can be operated for long periods of time.



Lift-up chip conveyor with drum filter (side disposal) Option



Spiral chip conveyor 2 sets Option

*Chip bucket is option

Sludge collection Option Patent No. 7233145

90% or more of the sludge in the tank is automatically collected. Reduced running costs by extending tool and coolant life, cleaner work environment by eliminating decay and unpleasant odor of coolant, and reduced time spent cleaning by improving maintenance intervals.

* Only available for casting & aluminum sludge
* Only available for water-soluble coolant

Before After

Power Saving, Reduced Environmental Burden & Operation Cost

Equipped with a function that reduces power consumption during idling and reduces environmental loading. The power monitor visualizes the power consumption of machines and the amount of power consumed per day, supporting customers in saving energy.

- ▶Power off function
- ▶Auto power off function
- ▶ECO drive function
- ▶ECO mode

Power monitor screen

MX-520 Specification / Equipment

Standard Machine Specifications

Movement and Ranges		
X-axis travel	[mm (in.)]	630 (24.80)
Y-axis travel	[mm (in.)]	560 (22.04)
Z-axis travel	[mm (in.)]	510 (20.07)
A-axis rotation angle	[deg]	-125 ～ +10
C-axis rotation angle	[deg]	360
Table		
Working surface	[mm (in.)]	Ø300 (11.81)
Loading capacity	[kg (lb.)]	200 (440)
Max. workpiece size	[mm (in.)]	Ø520 × H350 (Ø20.47 × H13.77) Ø710 × H350 (Ø27.95 × H13.77) (with restrictions)
Spindle		
Spindle speed	[min^{-1}]	40 - 12000 (grease lubrication)
Spindle speed change command		S5 digits direct command
Spindle taper		7/24 taper #40 (BT double contact type)
Spindle bearing inner diameter	[mm (in.)]	Ø80 (Ø3.14)
Max. spindle torque	[N·m]	159/1500min^{-1}
Feedrate		
Rapid traverse rate X / Y / Z	[mm (in.)/min]	40000/40000/40000 (1574.8)
A / C	[min^{-1}]	33 / 50
Feedrate X / Y / Z	[mm (in.)/min]	1 - 40000 / 1 - 40000 / 1 - 40000 (0.03 - 1574.8)
A / C	[min^{-1}]	33 / 50
Automatic Tool Changer		
Type of tool shank		JIS B 6339 tool shank 40T
Pullstud		JIS B 6339 pullstud 40P
Tool storage capacity	[tools]	60 (chain type)
Max. tool diameter (With adjacent tools)	[mm (in.)]	Ø80 (Ø3.14)
(Without adjacent tools)		Ø150 (Ø5.90) Storage pocket is limited for large diameter tools
Max. tool length	[mm (in.)]	300 (11.81)
Max. tool mass	[kg (lb.)]	10 (22)
Method of tool selection		Memory random system
Power Sources		
Electrical power supply	[kVA]	44 (depends on the options provided)
Power supply voltage	[V]	AC 200/220±10% Transformer is required for the voltage except above
Power supply frequency	[Hz]	50/60±1
Tank Capacity		
Coolant tank capacity	[L]	560
Oil cooler tank capacity	[L]	14 (total capacity:16)
	[L]	7 (total capacity: 9) (15000min^{-1} , 20000min^{-1} option)
Machine Size		
Machine weight	[kg (lb.)]	11,500 (PC4, 90T)
NC System		
Control system		***Matsuura G-Tech31i***
Standard Accessories		
Operating system: ***MiOS4***		***MIMS*** (Matsuura Intelligent Meister System)
AD-TAP function		***Intelligent Protection System***
IPC function		Integrating spindle run hour meter
Auto grease supply unit for feed axes		Integrating auto run hour meter
M-code counter (20 kinds)		Operation status monitoring (Operating data storage period: 2 months)
Service tools and tool box		Power off function
Machine color paint		Auto power off function
Leveling bolts, leveling plates		Power monitor
Scale feedback (A/C axis)		Tool pre-check function (Std only for machine with PC4)
Spindle thermal displacement compensation system		* 2 years spindle warranty

List of Fittings

○:Standard ▲:Option

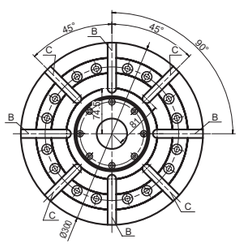
Spindle			
12000min^{-1} (BT40 grease lubrication)			○
12000min^{-1} Power Up (BT40 grease lubrication)			
Spindle motor output	kW	18.5 / 22	▲
Max. spindle torque	N·m	191	
15000min^{-1} (BT40 auto grease lubrication)			
Spindle motor output	kW	18.5 / 22	▲
Max. spindle torque	N·m	150	
20000min^{-1} (BT40 auto grease lubrication)			
Spindle motor output	kW	15 / 18.5	▲
Max. spindle torque	N·m	108	
20000min^{-1} (BT40 Oil-air lubrication)			
Spindle motor output	kW	15 / 18.5	▲
Max. spindle torque	N·m	108	
Tool Storage Capacity			
60 tool (chain type, memory random)			○
90 tool (chain type, memory random)			▲
120 tool (chain type, memory random)			▲
Table			
Ø300mm			○
Ø500mm			▲
Ø300mm + Flat table			▲
Pallet Changer System			
PC4 (floor pallet system) *1			▲
Work rotation system (manual) for PC4			▲
High Accuracy Control			
Scale feedback (X,Y,Z) Heidenhain			▲
Feed axis thermal displacement compensation			▲
Environmental thermal displacement compensation (12000min^{-1} or 15000min^{-1} or 20000min^{-1} spindle)			▲
Coolant			
Coolant unit (water soluble)			○
Coolant unit (oil soluble)			▲
Vacuum type coolant through A 7MPa or 14MPa			▲
Vacuum type coolant through B 7MPa or 14MPa			▲
Vacuum type coolant through C 2MPa or 7MPa			▲
Coolant flow checker			▲
Mist separator unit (without fire damper)			▲
Mist separator unit (with fire damper)			▲
Coolant temperature controller with tank 100L			▲
Coolant temperature controller with tank 200L			▲
Spindle coolant pump capacity			▲
Coolant management system (water soluble)			▲
In-Process Measurement, Tool Breakage Detection			
I.p.measure/auto.centering(Renishaw, Matsuura macro or Renishaw macro)			▲
I.p.measure/auto.centering(Renishaw macro only)			▲
I.p.measure/auto.centering(Blum, Matsuura macro or Blum macro)			▲
I.p.measure/auto.centering(Blum macro only)			▲
Broken tool detection (mechanical, Metrol)			▲
Broken tool detection (laser, Renishaw)			▲
Broken tool detection (laser, Blum)			▲
Broken tool detection in ATC (Metrol, 60/90/120tools)			▲
Auto measure calibration support (ACS-1/Ref. tool + Renishaw macro or Matsuura/Blum macro)			▲
Auto measure calibration support (ACS-1/without Ref. tool + Renishaw macro or Matsuura/Blum macro)			▲
Safety Device			
Automatic fire extinguisher			▲
Chip Removal			
Chip flush			○
Spiral chip conveyor			▲
Scraper type lift-up chip conveyor (incl. drum filter) rear disposal			▲
Scraper type lift-up chip conveyor (incl. drum filter) side disposal			▲
Chip bucket			▲
Air blow for chip swarf removal			▲
Workpiece cleaning gun (machine side)			▲
Workpiece cleaning gun (APC side)			▲
Sludge collection (water soluble)			▲
Operation/Maintenance Support			
Work light			○
Add optional block skip switch 2-9			○
Tool No.8 digits			○
Additional eight M function			▲
Spindle load monitoring function			▲
Weekly timer			▲
3 color signal light (red,yellow,green from top)			▲
AC100V outlet 3A			▲
External manual pulse generator			▲
eZ-5 (with calibration sphere)			▲
eZ-5 (without calibration sphere)			▲
Pressure supply system for fixtures			▲
Rotary wiper (air supply system)			▲
Rotary wiper (electrical system)			▲
Automation operator door			▲
Robot interface			▲
Operation status monitoring (storage capacity expansion: 1 year)			▲
Matsuura remote monitoring system			▲
Machine information output: MT connect/OPC UA			▲
Inside machine camera			▲
Large capacity memory (16GB)			▲
Processing Support			
Tool ID system (BALLUF)			▲
Tool IC system (BIG DAISHOWA)			▲
Synchro tip + Orbit function			▲
Optional Packages			
High-speed, high-precision package			▲
5-axis package			▲
High-speed, high-precision 5-axis package			▲

*1 Max. workpiece size for PC4 : Ø520xH330mm (Ø20.47xH12.99in.), 175kg

Ø300mm Table top view

Standard

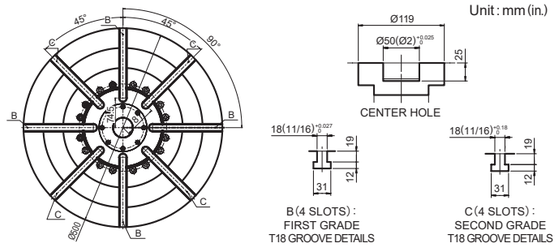
Unit : mm (in.)



Ø500mm Table top view

Option

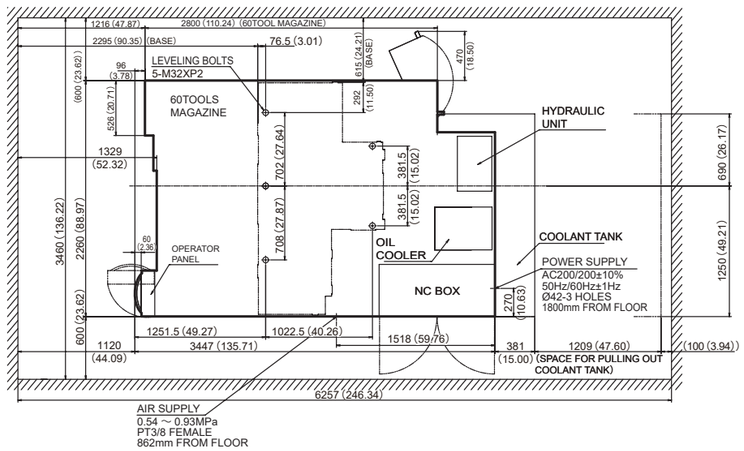
Unit : mm (in.)



MX-520 Floor plan

Standard

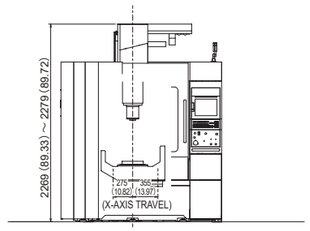
Unit : mm (in.)



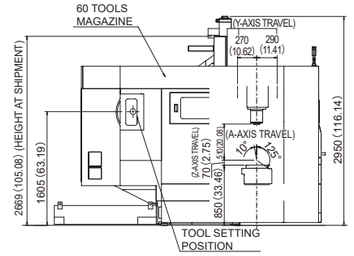
MX-520 External view

Unit : mm (in.)

[Front view]



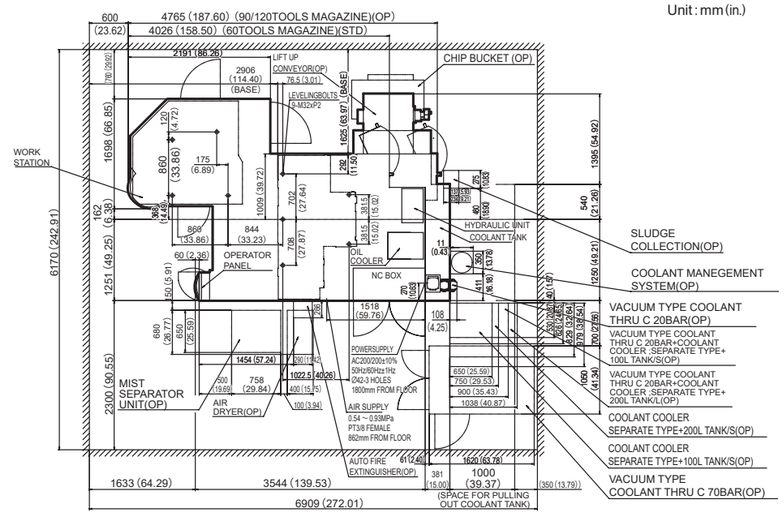
[Left side view]



MX-520 PC4 Floor plan

Option

Unit : mm (in.)

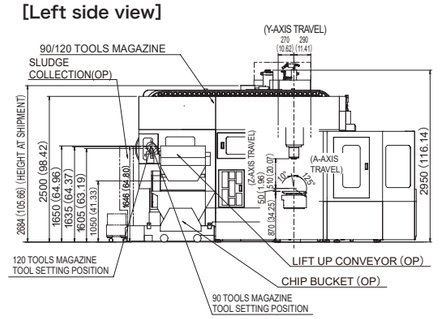


MX-520 PC4 External view

Unit : mm (in.)

[Front view]

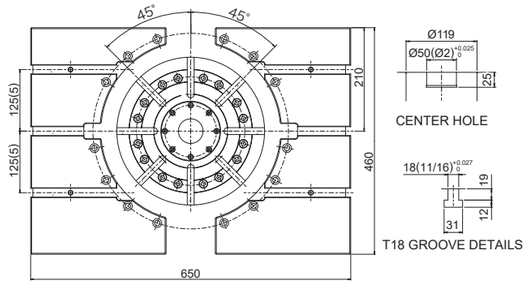
[Left side view]



Ø300mm + Flat Table top view

Option

Unit : mm (in.)



Pallet top view

Option

Unit : mm (in.)