Matsuura

Horizontal Machining Center

H.Plus-500

MAXIA

Innovation by Matsuura

Matsuura H.Plus-500

Redesigned from the ground up & hand-crafted in our state of the art factory in Japan utilizing "Monozukuri" principles, the all new *H.Plus-500* is a revolution in horizontal machining

Designed with the highest capacity specification in its class,
the new ***H.Plus-500*** incorporates many decades of
Matsuura horizontal excellence into one state of the art profit enhancing platform.

Vast array of cost effective options – tailored to your production

Integrated tools & pallet changers can be fully expanded later as your business changes & grows. Long periods of reliable and profitable unmanned running are assured.

*ATC: 60-tool drum type magazine provided as a standard feature. Expandable to a maximum of 245 tools (Matrix type) available as an option.
*APC: Floor pallet system (PC6) available as an option.

Ergonomically designed for ease of use

With an operator or integrated into an unmanned production environment, the ***H.Plus-500*** is designed & built around ease of use to minimise all non-productive time & to optimise spindle utilisation. New NC features include; Touch Screen, email functionality, on-screen manuals & enhanced MIMS software.

BT50 MAXIA Spindle as Standard

Matsuura – the pioneers of leading spindle technology are rightly proud of our MAXIA BT50 12,000 min^{-1} spindle supplied as standard with the ***H.Plus-500***. A 15,000min^{-1} option is also available. Both spindles offer superb operation and reliability – from aluminium machining to hard to cut steels & exotic materials.

High-speed, high-precision drive

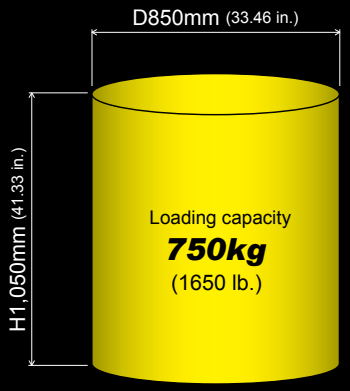
The rotary table is equipped with a proven Direct Drive motor (100min^{-1}). Matsuura's OEM & revolutionary DCS*1 function for the table clamp/unclamp system and ADC*2 function that automatically tunes acceleration/deceleration according to the workpiece weight are installed as standard.

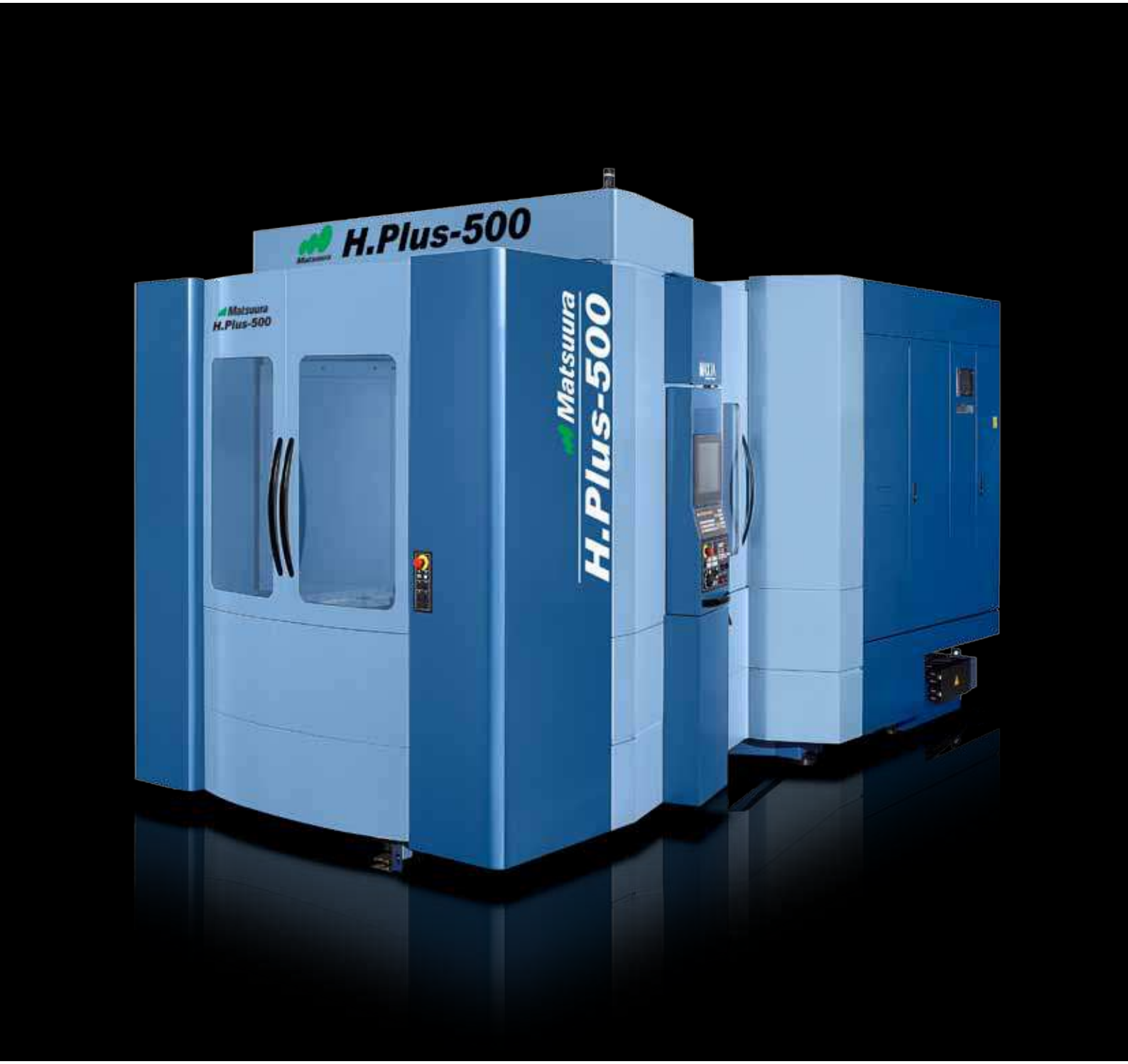
* 1 Dynamic Clamp System
* 2 Automatic Acc. & Dec. Control (Automatic acceleration/deceleration control function)

Compact floor space

Compared to the previous model, Matsuura Design Engineers have achieved a 15% reduction in required floorspace for the new ***H.Plus-500*** whilst increasing internal capacities for workpiece size, tools & pallets.

Maximum workpiece size





MAXIA
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Reliable, Capable, Proven and Advanced

Legendary Rigidity – ***H.Plus*** Series

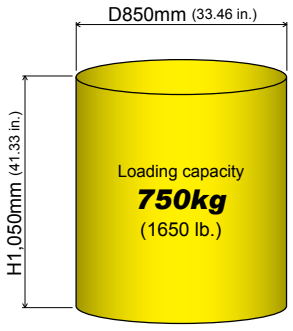
H.Plus Series machines are renowned in every industry for their superb rigidity, the new ***H.Plus-500*** has inherited from its forebears the proven engineering design principles to also achieve maximum rigidity

Maximum workpiece size	D850× H1,050 mm (D33.46× H41.33 in.)
Loading capacity	750 kg (1650 lb.)
Travel (X/Y/Z)	800 / 800 / 800 mm (31.49 / 31.49 / 31.49 in.)
Feedrate (X/Y/Z)	60 / 60 / 60 m/min (2.36 / 2.36 / 2.36 ipm)

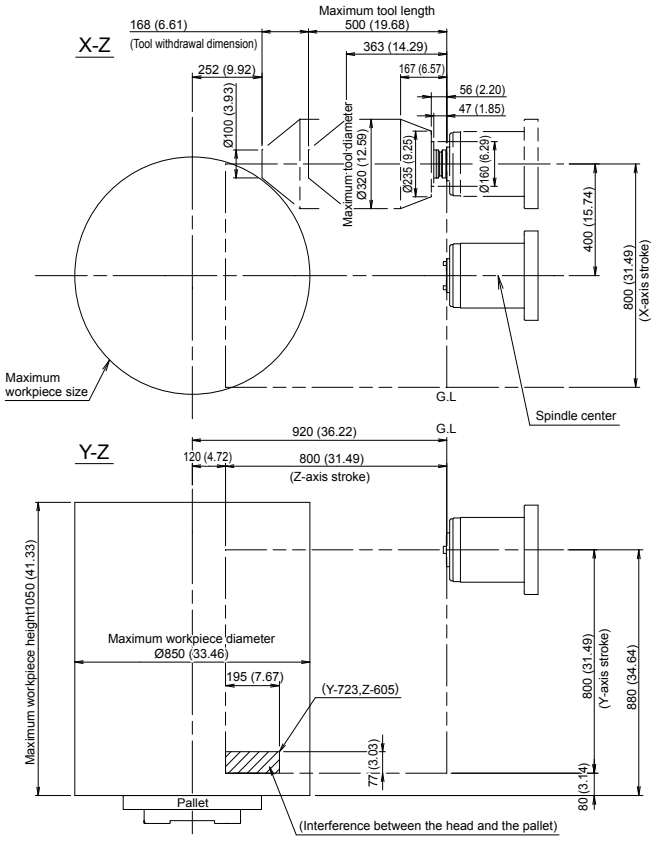
Increased Workpiece Capacity

Even considering the 15% reduction in required floor space, the new ***H.Plus-500*** has increased workpiece capacity – increasing from 900mm in height to 1,050mm & increased billet weight from 500kg to 750kg.

■ Maximum workpiece size



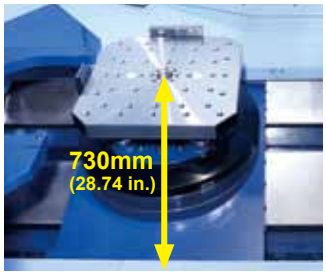
■ Stroke diagram (Unit: mm (in.))

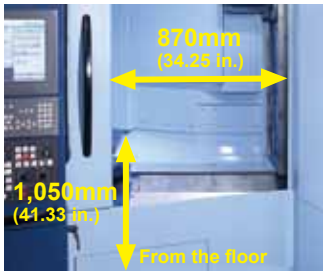


Designed to Maximise Workflow

The cavernous work area is serviced by an operator door that opens a massive 870mm. Pallet centre is a mere 730mm away from the door edge.

From the operator door to the pallet center	730 mm (28.74 in.)
Operator door opening width	870 mm (34.25 in.)
From the floor to the pallet top surface	1,050 mm (41.33 in.)





Expandable for Maximised Unmanned Running - ATC

60-tool ATC as standard

A proven & reliable 60 tool station ATC magazine (drum type) is the standard for the new ***H.Plus-500***. ***MIMS*** functionality assures rapid & smooth tool set-up.

Tool change time (tool-to-tool)	10 kg (22 lb.) or less	2.1 sec
	10 kg (22 lb.) and more	3.3 sec
Indexing time from the tool change position	Longest (T1→T31)	11.7 sec
	Shortest (1pot)	6.6 sec
Tool selection method		Fixed address system

ATC Options: Matrix Magazines for maximum unmanned production

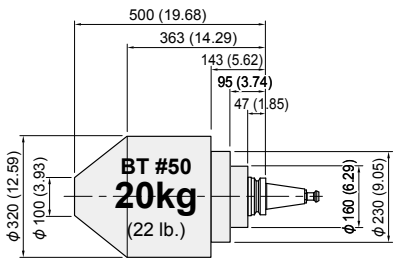
Option

High capacity type	A maximum of 245 tools can be stored.
High speed type	A maximum of 209 tools can be stored. Optimized tool rack arrangement to shorten tool transfer time

High speed type

Maximum tool weight: 20 kg, maximum tool length: 500 mm

(Unit: mm (in.))



*Common to the drum magazine and Matrix magazine

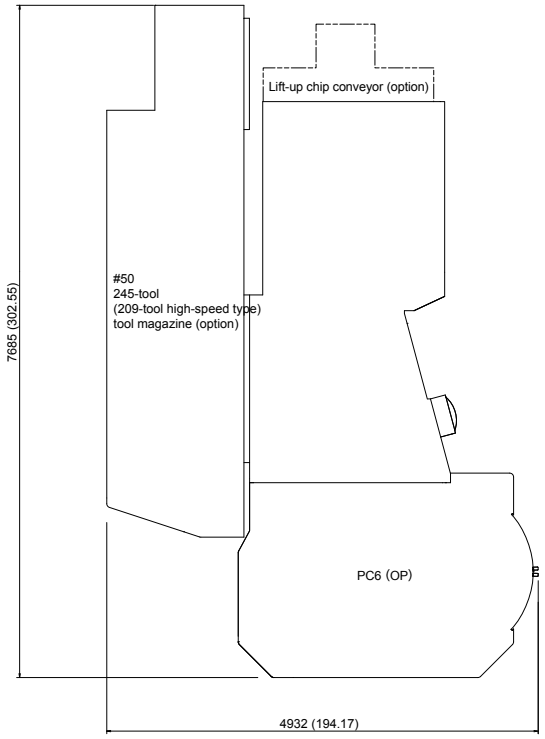
Expandable for Maximised Unmanned Running – APC Multi Pallet System

PC6 Floor pallet system

Floor pallet system (PC6) available as an option

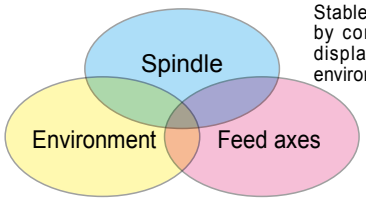
PC6 Floor pallet system

PC6 Floor plan (Unit: mm (in.))



Thermal displacement compensation

The thermal displacement compensation function 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. In addition, an environmental thermal displacement compensation function is newly employed to compensate deformation of the machine that may be induced by room temperature changes.



Stable machining accuracy is obtained by combining three kinds of thermal displacement compensation: spindle, environment, and feed axes (X/Y/Z).

* The X/Y/Z thermal displacement compensation function can be used on the machine with no scale feedback specification.

Pressure supply system for fixtures

Pressure supply ports for fixtures through the pallet are available as an option.

* A pressure supply source, solenoid valves, pressure switches, gap sensors, joints and hoses must be prepared by the customer.

	Number of ports	Pressure (MPa)
1. Work station side	8 ports	Max.19.6
2. Machine side	4 ports	Max.19.6

MAXIA Spindle
#50 taper, 12,000 min^{-1} as Standard

Spindle

All-round machining from high-speed aluminum cutting to hard-to-cut material cutting. The spindle thermal displacement compensation function, provided as a standard feature, ensures stable high-precision machining.

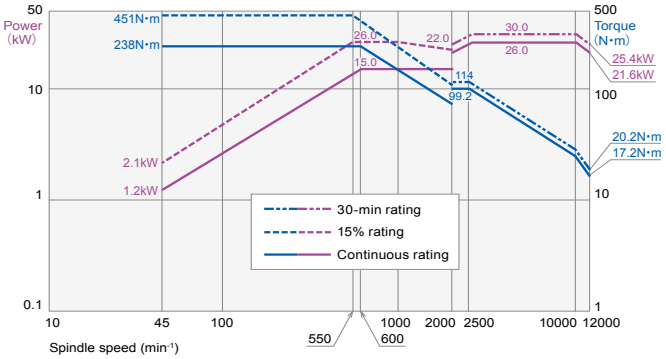
Spindle taper	12,000min^{-1}	15,000min^{-1}
BT50 (BT dual contact type)	Standard	Option
HSK-A100	Option	Option

MAXIA Spindle

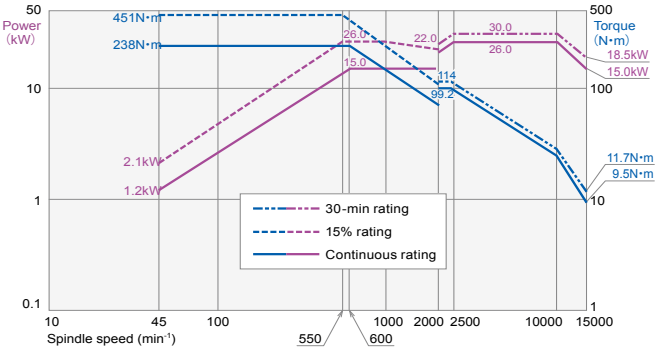
Fabricated in a dedicated clean room to ensure that spindle runout at the mouth is reduced to less than 1 micron. Thermal displacement, vibration and noise are reduced to the minimum and contribute to high precision machining.

Spindle motor power & torque diagram

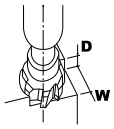
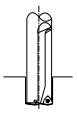
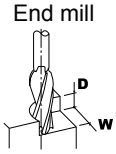
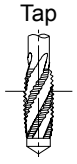
Standard BT50 12,000min^{-1}



Option BT50 15,000min^{-1}



■ Cutting test results (BT50 12,000min^{-1})

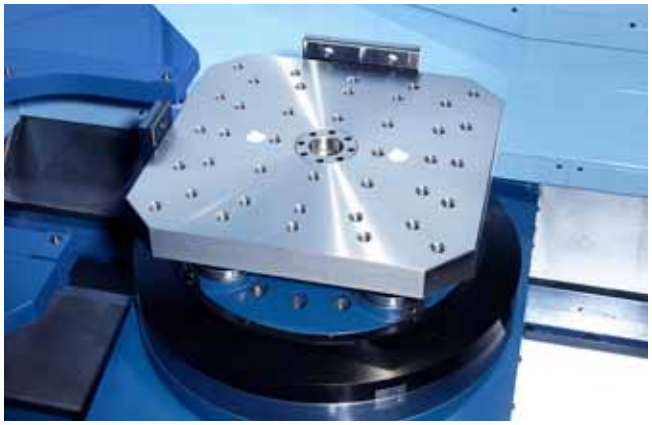
	Part material	Tool size	Cutting width / Cutting depth	Spindle speed	Cutting feed rate	Cutting capacity		Part material	Tool size	Spindle speed	Cutting feed rate	Cutting capacity
Face mill 	A5052	Ø100mm (3.93) 4 blades	W=80mm (3.14) D=5mm (0.19)	5,500 min^{-1}	8,000 mm/min (314.96)	3,200 cc/min	Drill 	A5052	Ø52mm (2.04)	1,500 min^{-1}	400 mm/min (15.74)	849 cc/min
	S50C	Ø125mm (4.92) 7 blades	W=100mm (3.93) D=6mm (0.23)	550 min^{-1}	950 mm/min (37.40)	570 cc/min		S50C	Ø52mm (2.04)	1,500 min^{-1}	220 mm/min (8.66)	467 cc/min
		Ø80mm (3.14) 5 blades	W=70mm (2.75) D=4mm (0.15)	1,000 min^{-1}	2,600 mm/min (102.36)	728 cc/min						
End mill 	A5052	Ø25mm (0.98) 2 blades	W=20mm (0.78) D=15mm (0.59)	12,000 min^{-1}	7,000 mm/min (275.59)	2,400 cc/min	Tap 	A5052	M42 × P4.5	120 min^{-1}	540 mm/min (21.25)	
	S50C	Ø25mm (0.98) 4 blades	W=3mm (0.11) D=40mm (1.57)	5,500 min^{-1}	6,000 mm/min (236.22)	720 cc/min		S50C	M42 × P4.5	80 min^{-1}	360 mm/min (14.17)	

* The above data is based on actual cases. Depending on conditions, actual results may differ.

Direct Drive (DD) Motor – 4th-axis Table

Rotary indexing table with a DD motor

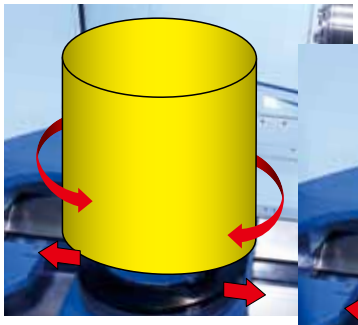
A non-contact, high-speed, high-acceleration, high precision DD motor (100 min^{-1}) is used for driving the 4th axis. This motor ensures low noise, superb unerring performance & trouble-free operation, and is virtually maintenance free.



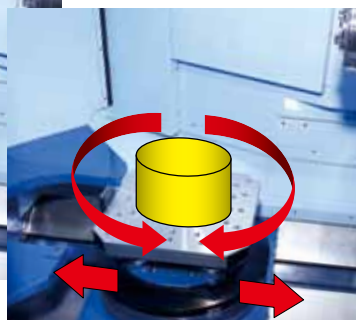
ADC (Automatic Acc. & Dec. Control)

Automatic acceleration/deceleration control function

The B-/Z-axis acceleration/deceleration can be automatically tuned during ATC operation according to the moment of inertia applied to the workpiece. Indexing time can be reduced by up to 40%.



Inertia: large
(B/Z axes:
normal acceleration/deceleration)



Inertia: small
(B/Z axes:
optimal acceleration/deceleration)

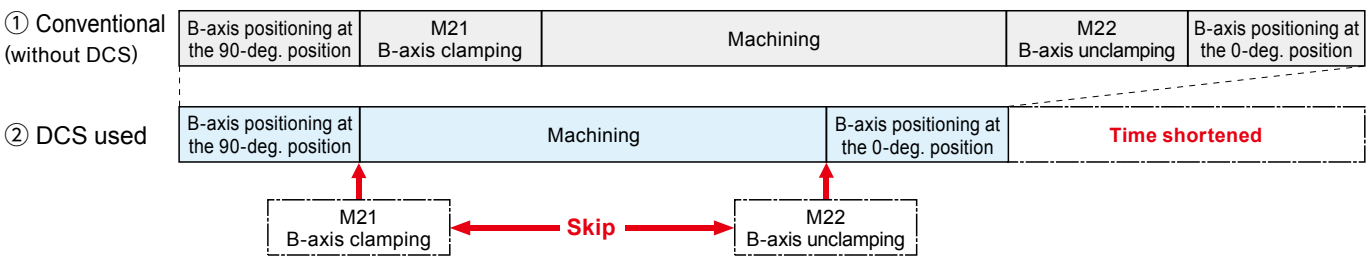
DCS (Dynamic Clamp System)

The key to shorter indexing times is the table clamping/unclamping time.
Matsuura's DCS function is the world's first revolutionary clamping system. The load level applied to the DD motor is monitored, and the table is clamped only when the load level has exceeded the setting value. The table remains unclamped even during machining as long as the load level is within the preset load range.

■ Within the preset load range ⇒ Machining with the table unclamped
(M21 and M22 skipped for light machining)

■ Load range exceeding the setting value ⇒ Machining with the table clamped
(M21 and M22 not skipped for heavy machining)

■ Light machining



MIMS with New Features for Safety and Security of Machining

MIMS *Matsuura Intelligent Meister System*

Digitized Meister knowledge, skills and ingenuity
Matsuura's unique interface to maximize rapid operation and usability

Environment

Eco Meister

Power saving

- Power cut-off function
- Energy-saving devices installed

Accuracy

Thermal Meister

Stable accuracy

- Spindle thermal displacement compensation
- X/Y/Z thermal displacement compensation
- Environmental thermal displacement compensation

Simple

Operability Meister

Fuss-free simple operation

- Tool setup support
- Workpiece setup support

Secure

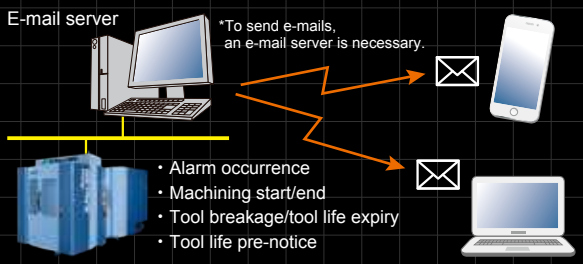
Reliability Meister

Machine downtime reduction

- Preventive maintenance support
- Failure cause analysis
- Electronic manuals
- E-mail function

E-mail function

At the occurrence of an alarm during operation, an e-mail message to notify the alarm can automatically be sent to the registered e-mail addresses. The operating status or machining progress status notification is also possible.



A maximum of 10 e-mail addresses can be set for each notification item.

Electronic manuals

Electronic manuals can be viewed on the main operation panel. Search features and bookmarks ensure quick access to the information you are looking for.

15-inch touch panel screen adopted

The machine is equipped with a new operating system that features a 15-inch touch panel. Icons required for operation, setup and maintenance are displayed on the screen. Screen display can be switched by single-tapping, and can be customized as needed.

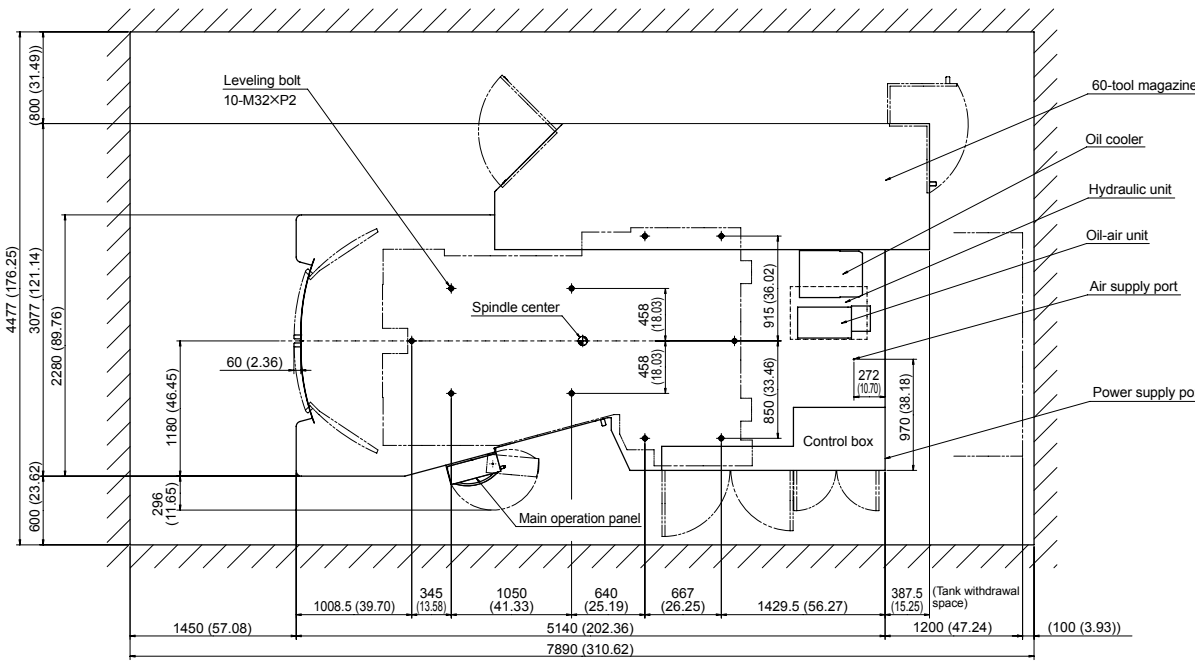
Standard Machine Specifcations

■ Movement and Ranges		
X-axis stroke (column right/left)	mm (in.)	800 (31.49)
Y-axis stroke (head up/down)	mm (in.)	800 (31.49)
Z-axis stroke (pallet back/forth)	mm (in.)	800 (31.49)
B-axis rotation angle (rotation on the Y axis)	deg	0 - 360
■ Table (Pallet)		
Working surface (X × Y)	mm (in.)	500×500 (19.68×19.68)
Loading capacity	kg (lb.)	750 (1650)
Max. part size	mm (in.)	φ850×H 1050 (φ33.46×H 41.33)
■ Spindle		
Spindle speed	min^{-1}	45 - 12000 (Oil-air lubrication)
Type of spindle taper		7/24 taper #50 (BT dual contact type)
Spindle bearing inner diameter	mm (in.)	100 (3.93)
Spindle motor output	kW	AC 15 / 22 / 26 (low-speed coil: cont. / 40% / 15%) AC 15 / 30 / 30 (high-speed coil: cont. / 30 min / 60%)
Max. spindle torque	N·m	451 / 550min^{-1}
■ Feed Rate		
Rapid traverse rate X / Y / Z	mm/min (ipm)	60000 / 60000 / 60000 (2362.20 / 2362.20 / 2362.20)
B	min^{-1}	100
■ Automatic Tool Changer		
Type of tool shank		JIS B 6339 tool shank 50T
Pull stud		JIS B 6339 pull stud 50P
Tool storage capacity	tools	60 (drum type)
Max. tool diameter	mm (in.)	110 (4.33) 230 (9.05) For medium-diameter tools. Storage locations are restricted. 320 (12.59) For large-diameter tools. Storage locations are restricted.
Max. tool length	mm (in.)	500 (19.68)
Max. tool mass	kg (lb.)	20 (44)
Method of tool selection		Fixed address system
Tool change arm		W-grip type

■ Automatic Pallet Changer		
No. of pallets		2
■ Power Sources		
Electrical power supply	KVA	71 (Depends on the optional features)
Power supply voltage	V	AC 200 / 220±10% Transformer required for the voltage except above
Power supply frequency	Hz	50 / 60±1
Compressed air supply	MPa	0.54 - 0.93
■ Tank Capacity		
Hydraulic oil tank	L	40
Coolant tank	L	600
Oil cooler tank capacity	L	10 (Total capacity: 30)
■ Machine Size		
Machine weight	kg (lb.)	15,000 (33,000)
■ NC System		
Control system		***Matsuura G-Tech 31i***

■ Standard Accessories	
01. Total splash guard with top side cover	02. ***ATC*** magazine guard
03. ***ATC*** auto door	04. Pallet magazine safety guard
05. Pallet loading station	06. Safety guard for loading station (with interlock)
07. Spindle oil cooler	08. Auto grease supply unit for feed axes
09. Air dryer	10. Coolant unit
11. Chip flush	12. Spiral chip conveyor
13. Swarf back disposal	14. Work light
15. Synchronized tapping function	16. ***AD-TAP*** function
17. Feed axis collision prevention (software OT)	18. Spindle overload protection
19. ***IPC*** function	20. Standard mechanical tools & tool box
21. M-code counter (9 kinds)	22. Machine color paint
23. ***MIMS*** (Matsuura Intelligent Meister System) Thermal Meister included	
24. Leveling bolts and plates (not for foundation)	
25. Software tool for memory card program operation & editing CD-ROM	
26. Spindle two-year warranty	

Floor Plan (Unit : mm (in.))



List of Fittings

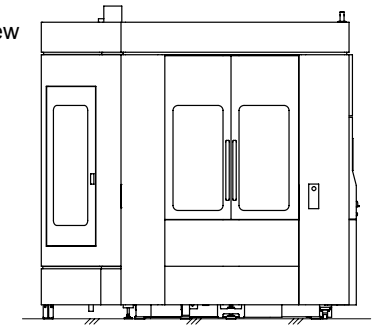
○: Standard ▲: Option

■ Spindle	
12,000 min^{-1} (BT50, oil-air)	○
15,000 min^{-1} (BT50, oil-air)	▲
12,000 min^{-1} (HSK-A100, oil-air)	▲
15,000 min^{-1} (HSK-A100, oil-air)	▲
■ ATC (drum magazine)	
60 tools (#50, fixed address)	○
61 tools (#50, memory random)	▲
60 tools (HSK-A100, fixed address)	▲
61 tools (HSK-A100, memory random)	▲
■ ATC (Matrix magazine)	
120/150/180/210/245/245 tools (#50, high capacity type, 245-tool base)	▲
114/144/174/209 tools (#50, high speed type, 209-tool base)	▲
120/150/180/210/245/245 tools (HSK-A100, high capacity type, 245-tool base)	▲
114/144/174/209 tools (HSK-A100, high speed type, 209-tool base)	▲
■ High Accuracy Control	
Scale feedback X-/Y-/Z-axis (Heidenhain)	▲
■ APC	
PC2	○
PC6 (Floor pallet system)	▲
■ Additional Axes	
Matsuura rotary table, built-in DD motor type (max. 100 min^{-1})	○
■ Coolant	
Coolant tank unit	○
Vacuum type through-spindle coolant A (7MPa)	▲
Vacuum type through-spindle coolant B (7MPa)	▲
Vacuum type through-spindle coolant C (2 MPa)	▲
Vacuum type through-spindle coolant C (7 MPa)	▲
Coolant flow checker (with through-spindle coolant)	▲
Ceiling shower coolant	▲
Mist separator (without fire damper)	▲
Mist separator (with fire damper)	▲
Coolant temperature controller with 100-liter tank (separately installed, small size)	▲
Coolant temperature controller with 200-liter tank (separately installed, large size)	▲

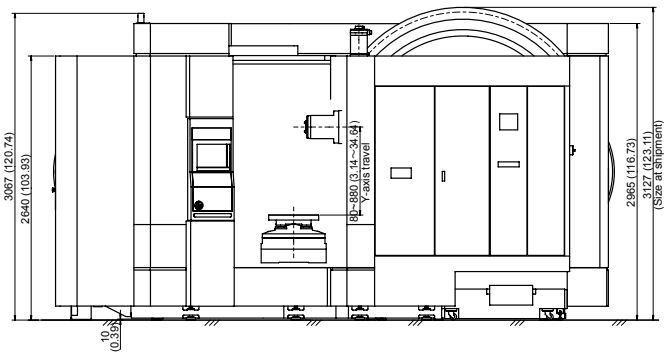
■ Automatic Measurement, Tool Breakage Detection	
Automatic measurement / automatic alignment (optical)	▲
Tool breakage / full automatic tool length measurement (contact)	▲
Tool breakage / full automatic tool length measurement (laser)	▲
Automatic measurement (optical) & tool breakage (contact)	▲
Automatic measurement (optical) & tool breakage (laser)	▲
External tool breakage (60-tool drum magazine, contact)	▲
External tool breakage (Matrix magazine, contact)	▲
■ Chip Removal	
Total splash guard	○
ATC auto door	○
Spiral chip conveyor	▲
2 MPa external nozzle (with through-spindle coolant)	▲
7 MPa external nozzle (with through-spindle coolant)	▲
Lift-up conveyor (scraper, drum, spiral, water-based)	▲
Chip bucket	▲
Air blow for chip removal	▲
Part washing gun (on the machine side)	▲
Part washing gun (on the APC side)	▲
■ Operation/Maintenance Support	
AD-TAP function	○
IPC function	○
MIMS	○
Auto grease supply unit for feed axes	○
Work light	○
Spindle runhour meter	○
Automatic operation runhour meter	○
Additional eight M functions	▲
Spindle load monitoring function	▲
Weekly timer	▲
3-color signal light (red, yellow, green from top)	▲
Rotary wiper (air driven)	▲
Rotary wiper (electrically driven)	▲
100 VAC socket 3 A	▲
Optional block skip addition 2 to 9	▲
Removable manual pulse generator	▲
Pre-machining tool check function	▲
Pressure supply system for fixtures	▲
■ Safety Devices	
Matsuura safety specification	○
Automatic fire extinguisher	▲
■ Optional Package	
High-speed high-accuracy package	▲

Outline (Unit : mm (in.))

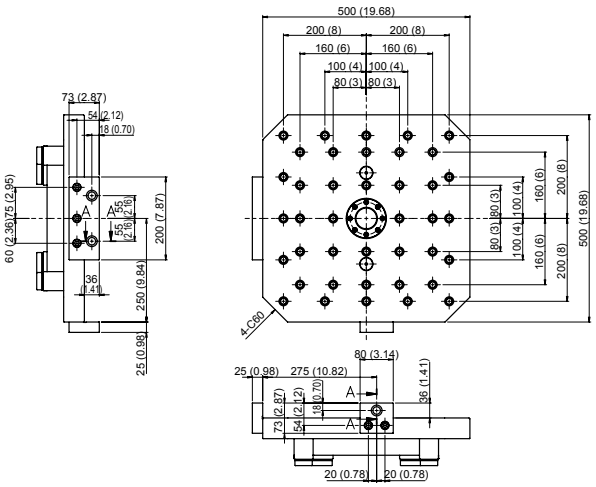
Front View



Right side view



Pallet Surface (Unit : mm (in.))



Matsuura

URL : http://www.matsuura.co.jp/
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