Matsuura

5-Axis Vertical Machining Center

MAM72-70V

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.

This product is subject to all applicable export control laws and regulations

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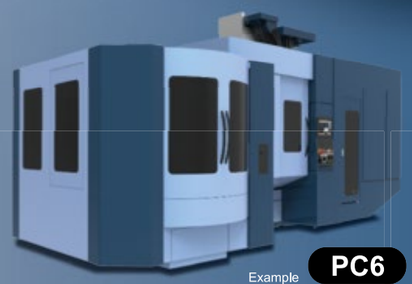
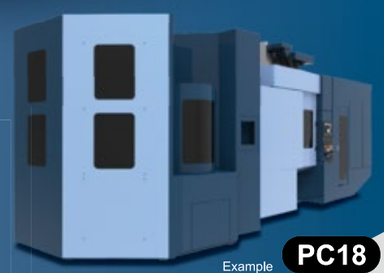
- ***Unrivalled Large Capacity Productivity***
- ***Enhanced Operability***
- ***Automated and Unmanned 5 axis Production***

PC2



Example PC6



Example PC18

New Addition to the *MAM72*[*1] Series – delivering *Matsuura*'s legendary 5 axis performance in an all new larger capacity design

*1: ***MAM*** (Matsuura Advanced Manufacturing)

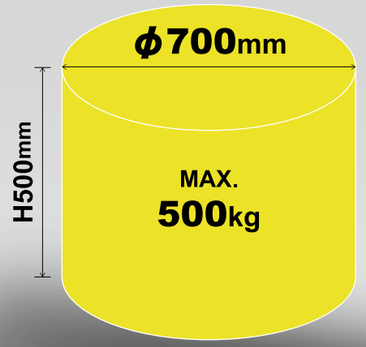
Extended unmanned operation + variable-part, variable-volume production

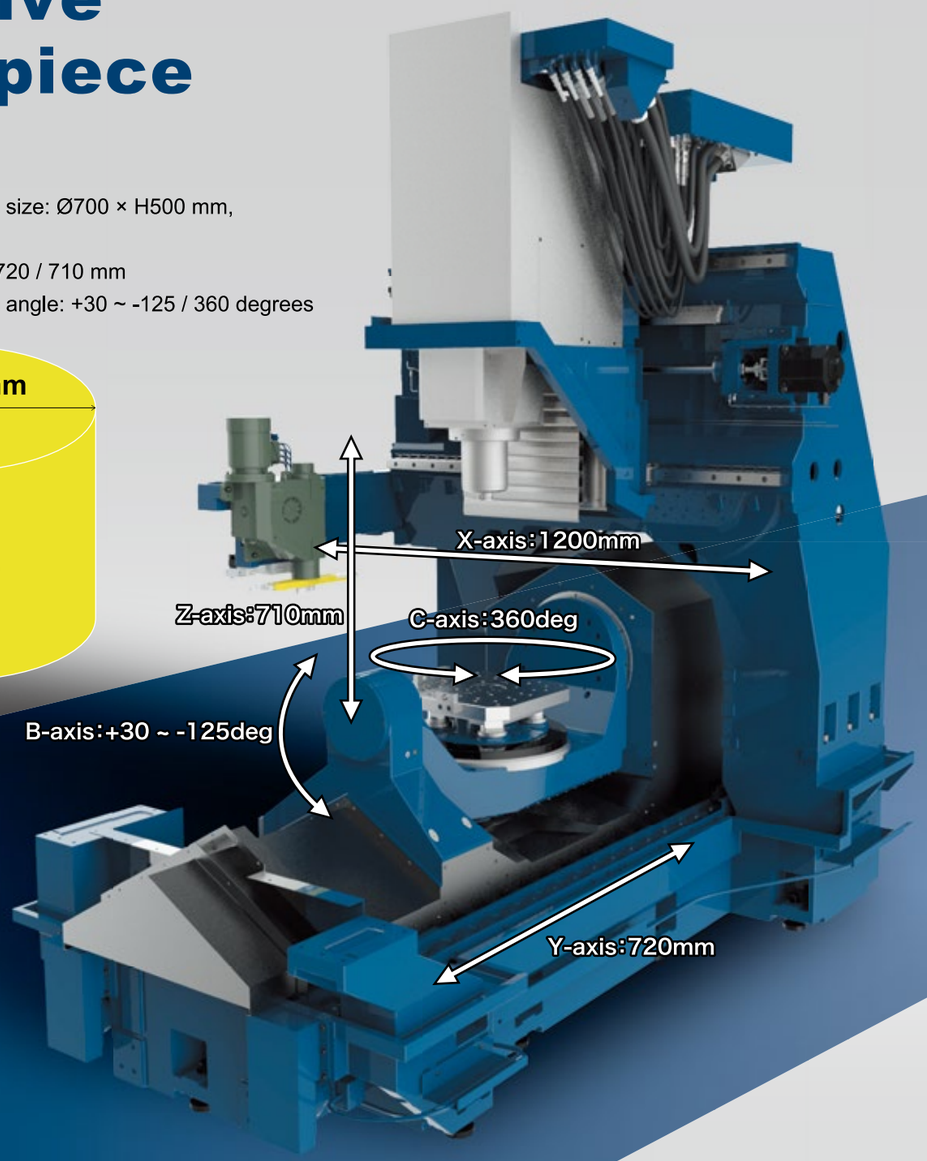
Responding to the requirements and demands of our global customer base, Matsuura Machinery Corporation introduces the ***MAM72-70V*** - a new high speed, large capacity 5-axis vertical machining center. Following the worldwide success of the ***MAM72-63V***, many customers have been seeking a higher capacity solution from ***Matsuura***, matching and exceeding the enviable characteristics of reliability, productivity and accuracy of the ***MAM72-63V***. The ***MAM72*** series (with many thousands of machines in successful global operation since their debut in 1991) originated the concept of the tower pallet system and remains unrivalled in the market place, nor challenged in ROI performance.

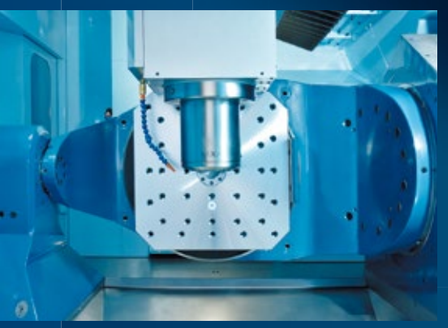
MAM72-70V
Seven Key Features

1 Massive Workpiece Size

Maximum workpiece size: Ø700 × H500 mm,
500 kgs in weight
X/Y/Z travel: 1200 / 720 / 710 mm
4th-/5th-axis rotation angle: +30 ~ -125 / 360 degrees

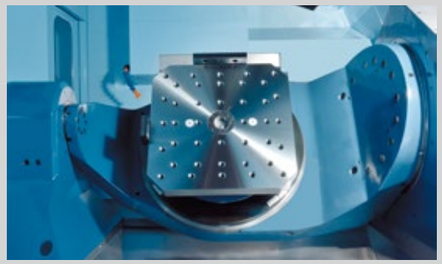






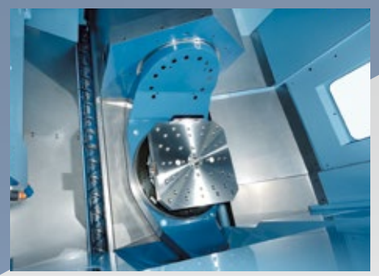
2 Newly Developed 4th-/5th-axis Table

Rapid traverse rate (4th-/5th- axis): 50/100 min^{-1}



3 Excellent Accessibility ▸ P8

Improved accessibility to workpiece and spindle



4 Ease of Maintenance ▸ P9

Centralized arrangement of maintenance equipment, stainless steel covers installed

5 ATC Tool Magazine/ APC Pallet System ▸P10.11

Multi-pallet systems (PC6, PC18) are included in the lineup of options.
A matrix magazine capable of holding a maximum of 530 tools is also available.

6 MAXIA Spindle ▸ P7

Standard: 15000 min^{-1}
High-output (350 N·m) and high-speed (20000 min^{-1}) types available as an option

7 Improved Operability ▸P12.13

Ergonomically designed for ease of operation.

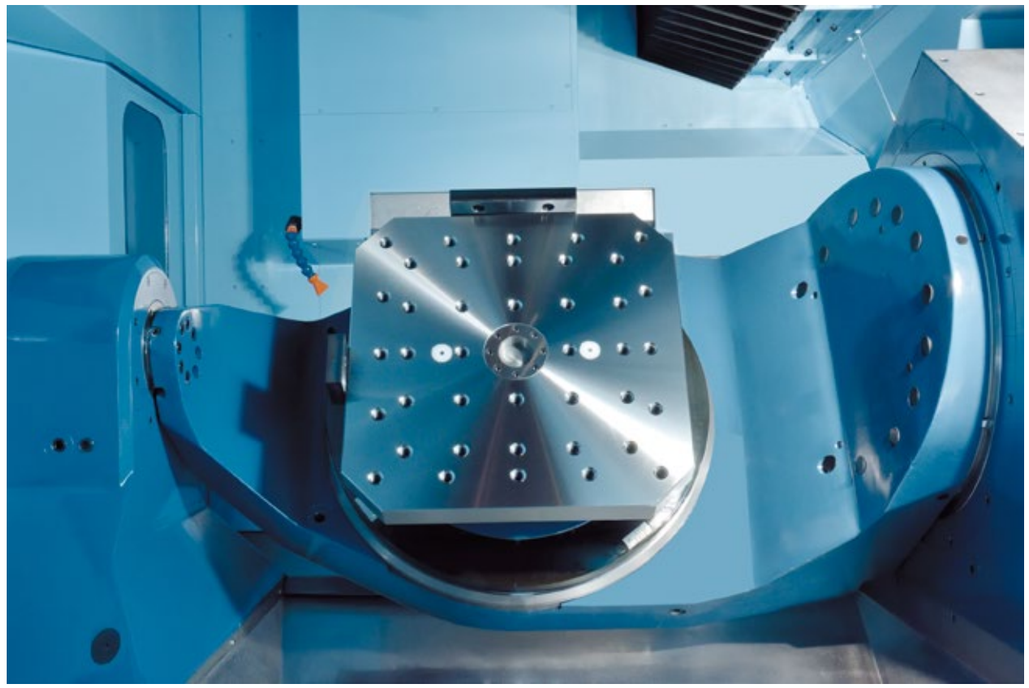
MAM72-70V

5-Axis Vertical Machining Center

Designed to maximise process efficiency

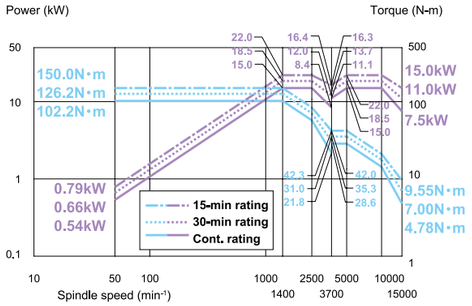
High speed, unerring accuracy and longevity of sustained performance are assured with our proven 4th / 5th axis design

- A DD drive system is employed for the 5th-axis unit.
- The 4th-axis unit with a new roller gear drive ensures high speed (50 rpm), high rigidity, and high precision (zero backlash).
- High-resolution scale feedback system provided as standard.

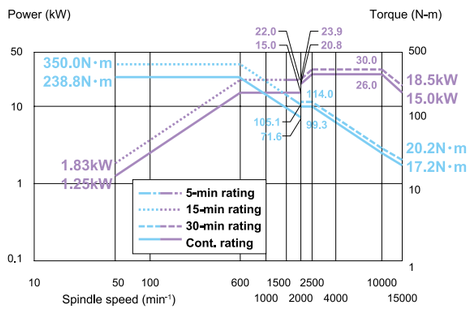


[4th-/5th-axis specifications]

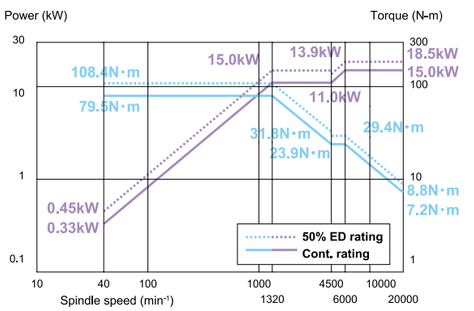
	4th axis (tilting axis)	5th axis (rotating axis)
Drive system	Roller gear	DD
Feed rate	50min^{-1}	100min^{-1}
Allowable cutting torque	3964N·m	620N·m
Brake torque	4147N·m	3619N·m



Standard **BT40 15000min^{-1}／150N·m**



Option **BT40 15000min^{-1}／350N·m**



Option **BT40 20000min^{-1}**

The heart of the machine; the MAXIA spindle line up assures machining excellence in any industry sector, cutting any material

- Matsuura MAXIA Spindles; The pinnacle of the art.
- Exceptional accuracy, rigidity and quietness, and able to handle a wide range of materials from difficult-to-cut materials to aluminum.
- All Matsuura MAXIA Spindles are hand-built inhouse by seasoned Matsuura Engineers. Our strict adherence to our own QA system is why MAXIA spindles are globally renowned for longevity of performance and sustained accuracy.
- Maintenance-free grease-lubricated spindles have low rotation noise and are very environmentally friendly.
- A spindle bearing inner diameter of 80 mm ensures high rigidity (at 15000 min^{-1}).

▪ Machining test results (BT40 15000min^{-1} 150N·m)

	Workpiece material	Tool details	Cutting width & depth	Spindle speed	Cutting feed rate	Cutting capacity
Facemill	Aluminum	Ø80mm 3-flute	W=70mm D=5mm	5500 min^{-1}	8000 mm/min	2800 cc/min
	Steel	Ø80mm 9-flute	W=70mm D=3mm	1120 min^{-1}	3000 mm/min	630 cc/min
Endmill	Aluminum	Ø25mm 2-flute	W=22mm D=8.5mm	10000 min^{-1}	10000 mm/min	1870 cc/min
	Steel	Ø20mm 4-flute	W=3mm D=35mm	5500 min^{-1}	5500 mm/min	578 cc/min

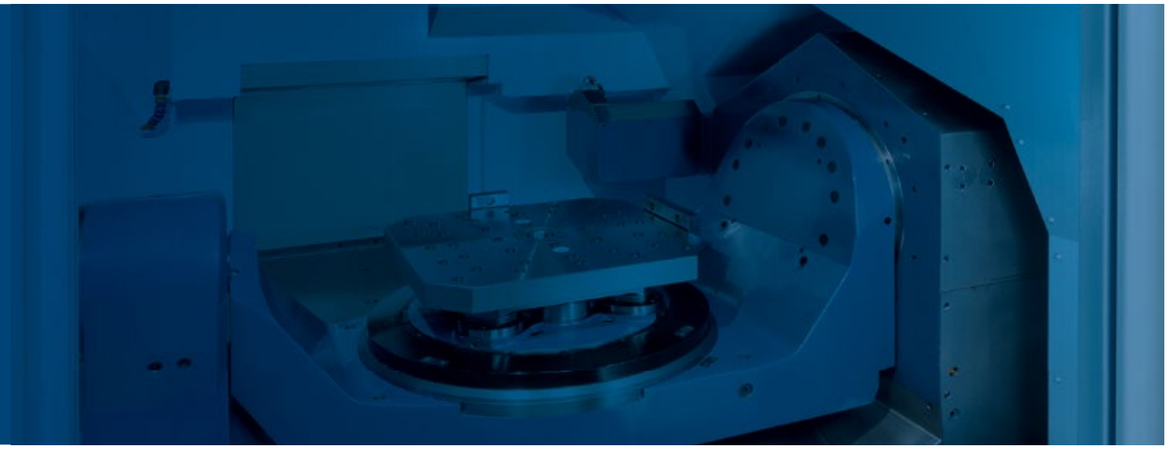
	Workpiece material	Tool details	Spindle speed	Cutting feed rate	Cutting capacity
Drill	Aluminum	Ø35mm	1500 min^{-1}	700 mm/min	673 cc/min
	Steel	Ø35mm	1300 min^{-1}	330 mm/min	317 cc/min
Tap	Aluminum	M36 ×P4.0	100 min^{-1}	400 mm/min	–
	Steel	M30 ×P3.5	100 min^{-1}	350 mm/min	–

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

MAM72-70V

5-Axis Vertical Machining Center

Ergonomically designed for maximum working efficiency and comfort



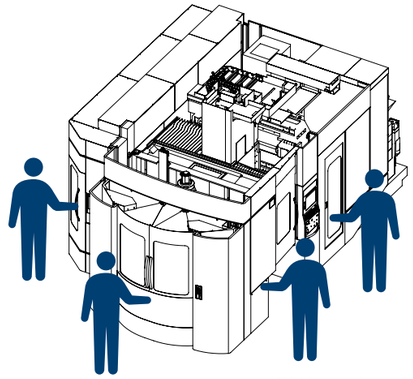
Unfettered access to the machining enclosure assures comfort during set-up / maintenance

- The operator door opens 720 mm wide, which facilitates workpiece setup and maintenance work.
- Good access to the workpiece and spindle: distance from machine front (oil pan edge) to pallet center: 620 mm, that to spindle center: 90 mm.
- The height from the floor to the pallet top is 1080mm, enhancing the operator experience when working on set-ups.

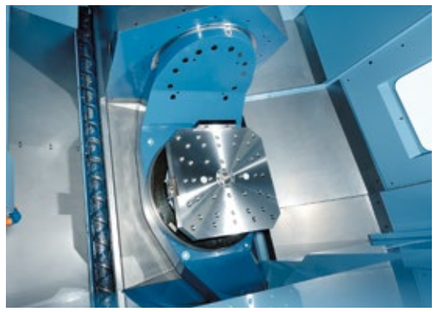
① Operator door opening width	720mm
② Distance from machine front to pallet center	620mm
③ Distance from machine front to spindle center	90mm
④ Height from floor to pallet top	1080mm

A designed working environment is a productive one

- Ease of maintenance is assured by arranging equipment that needs regular maintenance close to the operator.
- Efficient chip removal and evacuation from the machining enclosure.
  Precision stainless steel telescopic covers are installed inside the machine to allow smooth chip flow and fall-away.
  The transfer capacity of the spiral conveyor is designed to be higher than the machines metal removal rate achieved by machining performance.
- The tool magazine is equipped with an access door for ease of maintenance.
- All access points required by the operator are within close proximity with each other to minimise operator movement and maximise their efficiency.



*Matrix magazine type



Stainless steel cover / Spiral chip conveyor

90-tool magazine maintenance door

Centralized layout of maintenance devices

MAM72-70V

5-Axis Vertical Machining Center

Matsuura **unmanned automation; the route to higher machine utilization and profitability**

Tool Capacity; tailored to your current process, adaptable for your future needs

90-tool magazine (chain type) Standard

- Standard; 90 Tool, chain driven. Reduced indexing time via random pot memory system.

Tool management screen

- Tool life management functionality is provided as a standard feature, enabling extended unmanned operation and complete oversight of tool history and status within the machine.

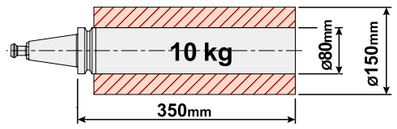
Matrix tool magazine Option

- The newly developed Matrix magazine has a large storage capacity (max. 530 tools) and a small footprint. Tools can be stored in sufficient quantity to assist diverse machining requirements including complex 5-axis machining, variable-part variable-volume production and extended unmanned operation.
- The Matrix magazine can optionally handle **tools up to 450 mm** in length.

∗ Storage positions are restricted for 450-mm long tools. Up to nine (Ø80 mm or less) or five (Ø80-150 mm) tools 450 mm long can be stored.

330-tool base Matrix magazine

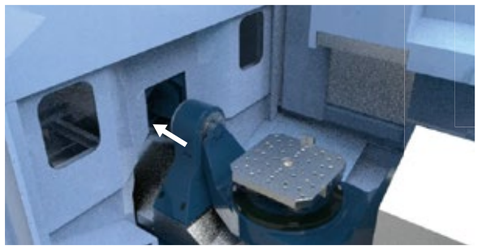
Max. tool size



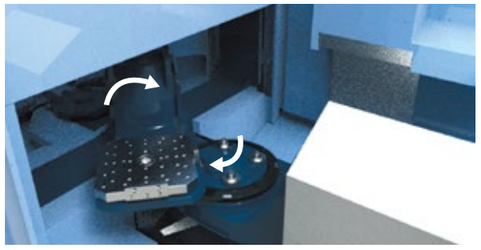
Type of tool shank : JIS B 6339 40T
Max. tool diameter : Ø80mm
Ø150mm with no adjacent tools
Max. tool length : 350mm
450mm Option
Max. tool weight : 10kg

Matsuura **Multi-Pallet Systems; from the pioneers of reliable and proven unmanned peration**

- Innovative and dynamic rotary APC.
  The support of the 4th-/5th-axis table is retractable under the APC door to minimize the overall machine length to a compact size.
- From twin pallet, to 6 pallet, to 18 pallet to FMS – our pallet pool choices are defined to match your current workflow and accommodate future growth.
- Add an “unmanned night shift” to your bottom line.
- PC6 floor pallet system
- PC18 tower pallet system
  The multi-storey tower pallet system accommodates 18 pallets in a small footprint.

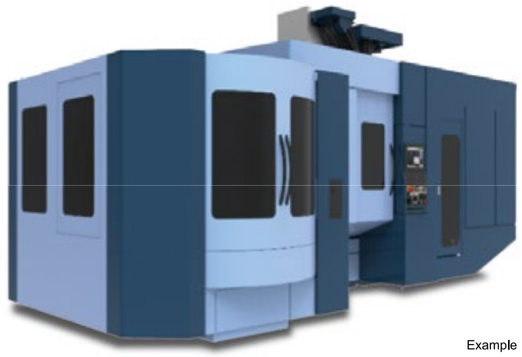


Support retractable under the APC door



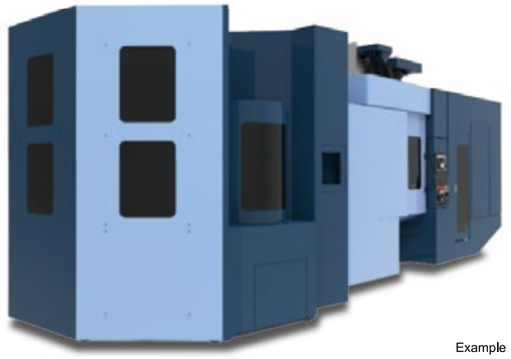
Rotary type

PC2 Standard



Example

PC6 Floor pallet system Option



Example

PC18 Tower pallet system Option

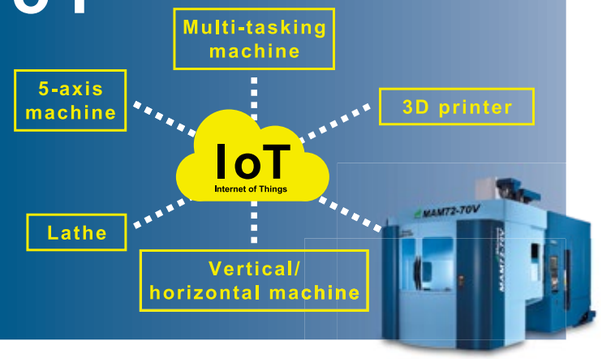
MAM72-70V

5-Axis Vertical Machining Center

Easy Operation

Ready for "IoT"

which enables sharing of information with various machines. Visualization of machine statuses facilitates optimal preventive maintenance and failure prognosis to optimize production.



Easy to view / No confusion / No mistakes

MIMS

Matsuura Intelligent Meister System

Security

Reliability Meister

Reduced machine downtime

- Preventive maintenance support function
- Machine recovery support function
- Electronic manual function
- E-mail transmission function

Simplicity

Operability Meister

Hassle-free, simple operation

- Tool setup support
- Workpiece setup support

Accuracy

Thermal Meister

Stable accuracy

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

Environment

Eco Meister

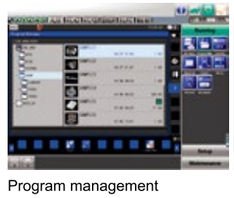
Eco mode

Power savings

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

Operation panel

FANUC 31i
(iHMI, 15-inch touch panel type)
Usability is drastically upgraded with context-sensitive screen icons and quick screen displays.


Program management


Tool offset


Electronic manual display

Intelligent Protection System

Collision prevention function

Standard

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

■ **On-line link with PC**

PC — Machining center

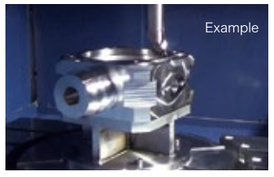
* ***The Intelligent Protection System*** simulates your programmed components (tools, workpiece, fixtures, etc.) according to the machine model, alerting you to any possible interference or collision before actual machining takes place.
* Prepare a PC on your side. Contact Matsuura for PC requirements.

Synchro Tip + Orbit machining

Patent No. 5883535 Option

Simple turning function by 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 process, no additional setup is required for a turning process.


Example

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

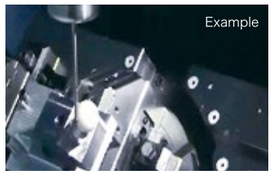
eZ-5

Option

5-axis error probing and correction

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

* eZ-5 requires a separately available NC option to add macro variables.


Example

Automatic measurement (interactive)

Option

Operators can perform alignment without being conscious of program contents.

MAM72-70V

[Specification / Equipment]

Standard Machine Specifications

Travel		
X-axis travel	[mm (in.)]	1200 (47.24)
Y-axis travel	[mm (in.)]	720 (28.34)
Z-axis travel	[mm (in.)]	710 (27.95)
4th (B) axis rotation angle	[deg]	+30 ～ -125
5th (C) axis rotation angle	[deg]	360
Pallet		
Working surface (X × Y)	[mm (in.)]	500 x 500 (19.69 x 19.69)
Loading capacity	[kg (lb.)]	500 (1100)
Max. workpiece size	[mm (in.)]	Ø700 x H 500 (Ø27.56 x H 19.68)
Spindle		
Spindle speed	[min⁻¹]	40 - 15000 (auto grease)
Spindle speed change command		S5 digits direct command
Type of spindle taper		7/24 taper #40 (BT dual contact type)
Spindle bearing inner diameter	[mm (in.)]	Ø80 (Ø3.14)
Max. spindle torque	[N·m]	150/1400min⁻¹
Spindle motor	[kW]	AC15/22 (low-speed coil: cont. / 15 min.)
	[kW]	AC15/22 (high-speed coil: cont. / 15 min.)
Feed Rate		
Rapid traverse rate X / Y / Z	[mm/min (ipm)]	60000/60000/60000 (2362.2)
B / C	[min⁻¹]	50/100
Automatic Tool Changer		
Type of tool shank		JIS B 6339 tool shank 40T
Pull stud		JIS B 6339 pull stud 40P
Tool storage capacity	[tools]	90 (chain magazine)
Max. tool diameter (with adjacent tools)	[mm (in.)]	Ø80 (Ø3.14)
(without adjacent tools)	[mm (in.)]	Ø150 (Ø5.9) Storage locations are restricted.
Max. tool length	[mm (in.)]	350 (13.77)
Max. tool weight	[kg (lb.)]	10
Tool selection method		Memory random system
Tool change arm		W-grip type

Automatic Pallet Changer		
No. of pallets		2
Power Sources		
Electrical power supply	[kVA]	85 (depends on the optional features)
Power supply voltage	[V]	AC 200/220±10% Transformer required for a voltage other than above
Power supply frequency	[Hz]	50/60±1
Air pressure to be supplied	[MPa]	0.54 ～ 0.93
Air volume to be supplied (working flow volume)	[NL/min]	115 (*atm.)
Air volume to be supplied (maximum flow volume)	[NL/min]	580 (*atm.) : 15000min⁻¹
		610 (*atm.) : 20000min⁻¹ option
Tank Capacity		
Hydraulic unit tank	[L]	40
Coolant tank	[L]	800
Oil cooler tank	[L]	22 (total capacity: 26)
Machine Size		
Machine weight	[kg (lb.)]	19000kg (PC2/90tools) *
Standard Accessories		
Total splash guard		ATC auto door
Synchronized tapping function		AD-TAP function
IPC function		Spindle oil cooler
Auto grease supply unit for feed axes		Coolant unit
Chip-flush coolant		Spiral chip conveyor (right/left)
Spindle overload protection		M-code counter (9 kinds)
Work light		Standard mechanical tools & tool box
Machine color paint		Leveling pads & bolts
Scale feedback B-/C-axis		PC tool for memory card program operation / editing
MIMS (Matsuura Intelligent Meister System)		Intelligent Protection System
Spindle runhour meter		Automatic operation runhour meter
ADC (Automatic Acc. & Dec. Control)		DCS (Dynamic Clamp System)
Thermal displacement compensation (spindle, feed axes, environment)		
＊Spindle two-year warranty		

* Calculated value

List of Fittings

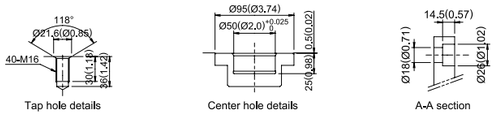
○:Standard ▲:Option

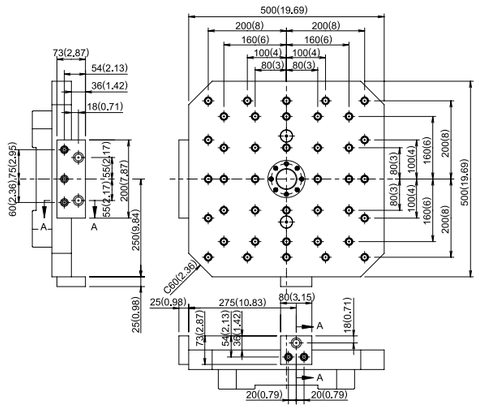
Spindle	
15000 min⁻¹, BT40, grease, 15/22 kW, 150 N·m	○
15000 min⁻¹, BT40, grease, 15/30 kW, 350 N·m	▲
20000 min⁻¹, BT40, grease, 15/18.5 kW, 108.4 N·m	▲
ATC	
90 tools (chain magazine)	○
130 / 170 / 210 / 250 / 290 / 330 tools (Matrix magazine: 330-tool base)	▲
370 / 410 / 450 / 490 / 530 tools (Matrix magazine: 530-tool base)	▲
Max. tool length 450 mm (for the matrix magazine only)	▲
APC	
PC2	○
PC6 (Floor pallet system)	▲
PC18 (Tower pallet system)	▲
Chip Removal	
Total splash guard	○
Spiral chip conveyor	○
ATC auto door	○
Chip-flush coolant	○
Lift-up conveyor (scraper, drum, water-based)	▲
Chip bucket	▲
Air blow for chip removal	▲
Part washing gun (on the machine side)	▲
Part washing gun (on the APC side)	▲
External nozzle 2 MPa (with through-spindle coolant)	▲
External nozzle 7 MPa (with through-spindle coolant)	▲
Coolant	
Coolant tank unit	○
Mist separator (without fire damper)	▲
Mist separator (with fire damper)	▲
Vacuum type through-spindle coolant A 7 MPa	▲
Vacuum type through-spindle coolant A 14 MPa	▲
Vacuum type through-spindle coolant B 7 MPa	▲
Vacuum type through-spindle coolant B 14 MPa	▲
Vacuum type through-spindle coolant C 2 MPa	▲
Vacuum type through-spindle coolant C 7 MPa	▲
Coolant temperature controller with 100-liter tank (separately installed, small size)	▲
Coolant temperature controller with 200-liter tank (separately installed, large size)	▲
Coolant flow checker	▲

Automatic Measurement, Tool Breakage Detection	
Automatic measurement / automatic alignment (optical)	▲
Tool breakage / fully automatic tool length measurement (contact)	▲
Tool breakage / fully automatic tool length measurement (laser)	▲
External tool breakage (90 tools, contact)	▲
External tool breakage (Matrix magazine, contact)	▲
Operation/Maintenance Support	
AD-TAP function	○
IPC function	○
Auto grease supply unit for feed axes	○
Work light	○
MIMS	○
Intelligent Protection System	○
Additional eight M functions	▲
Spindle load monitoring function	▲
Weekly timer	▲
3-color signal light (red, yellow, green from top)	▲
100 VAC socket 3 A	▲
Removable manual pulse generator	▲
Pre-machining tool check function	▲
eZ-5 (with calibration ball)	▲
eZ-5 (without calibration ball)	▲
Pressure supply system for fixtures	▲
Rotary wiper (air driven)	▲
Rotary wiper (electrically driven)	▲
Optional Packages	
True Path	▲
Machine module	▲
High-speed high-accuracy package	▲
5th-axis package	▲
High-speed high-accuracy & 5th-axis package	▲
Value package	▲

MAM72-70V Pallet Top View

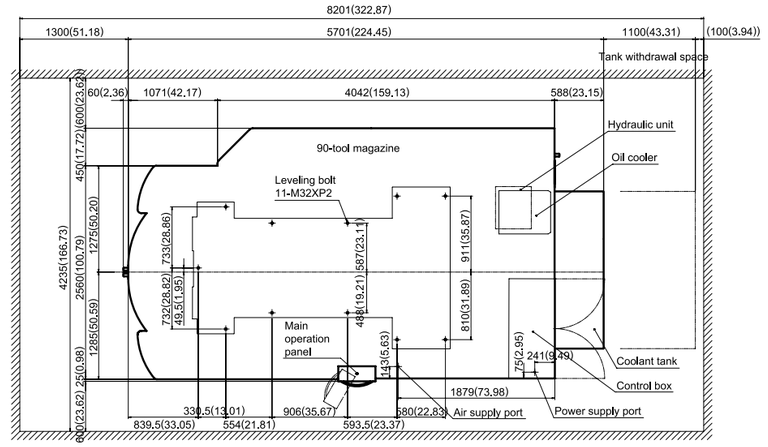
Unit: mm (in.)





MAM72-70V Floor Plan

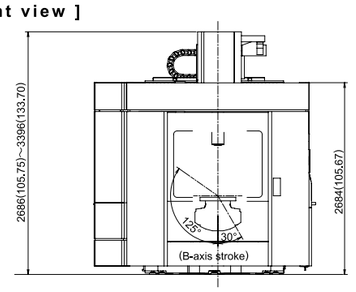
Unit: mm (in.)



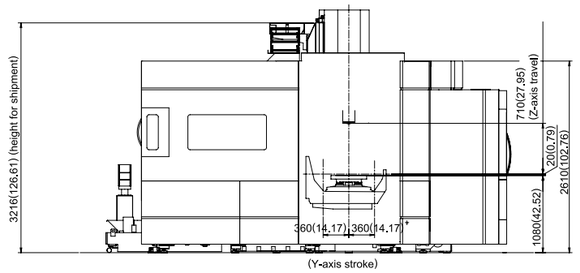
MAM72-70V External View

Unit: mm (in.)

[Front view]



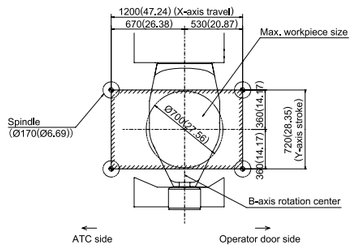
[Left side view]



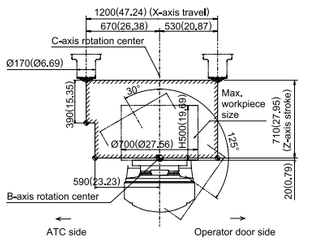
MAM72-70V Spindle Stroke Diagram

Unit: mm (in.)

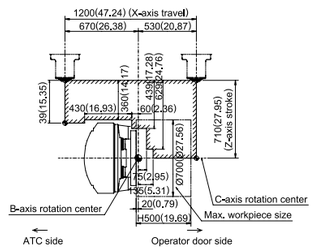
X-Y area



X-Z area with the B-axis at 0 degrees



X-Z area with the B-axis at 90 degrees



Y-Z area