

# MX-850



URL : <https://www.matsuura.co.jp/>  
E-MAIL : [webmaster@matsuura.co.jp](mailto:webmaster@matsuura.co.jp)

**MATSUURA MACHINERY CORPORATION**  
4-201 Higashimorida, Fukui City 910-8530, Japan  
TEL : +81-776-56-8106 FAX : +81-776-56-8151

**MATSUURA EUROPE GmbH**  
Berta-Cramer-Ring 21  
D-65205 Wiesbaden-Delkenheim, Germany  
TEL : +49-6122-7803-80 FAX : +49-6122-7803-33  
URL : <https://www.matsuura.de/>  
E-MAIL : [info@matsuura.de](mailto:info@matsuura.de)

**MATSUURA MACHINERY Ltd.**  
Gee Road, Whitwick Business Park, Coalville Leicestershire, LE67  
4NH, England  
TEL : +44-1530-511-400 FAX : +44-1530-511-440  
URL : <https://www.matsuura.co.uk/>  
E-MAIL : [sales@matsuura.co.uk](mailto:sales@matsuura.co.uk)

**ELLIOTT MATSUURA CANADA INC.**  
2120 Buckingham Road Oakville Ontario L6H 5X2, Canada  
TEL : +1-905-829-2211 FAX : +1-905-829-5600  
URL : <https://www.elliottmachinery.com/>  
E-MAIL : [sales@elliottmachinery.com](mailto:sales@elliottmachinery.com)

**MATSUURA MACHINERY USA INC.**  
325 Randolph Ave., St.Paul, MN 55102, U.S.A.  
TEL : +1-651-289-9700  
URL : <https://www.matsuurausa.com/>  
E-MAIL : [info@matsuurausa.com](mailto:info@matsuurausa.com)

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- The photos may show optional accessories.

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



PC4

**MAXIA**  
Innovation by  Matsuura

**MX Series;** our globally best-selling 5-axis machine delivering a proven rapid return on investment for our customers

# MX Series

A Wide Range of Product Lineup for  
Entry-level 5-axis Machining and Automation Market

## 5 Reasons Why Customers Choose The MX Series

**1** Productivity improvement by 24 hours continuous operation

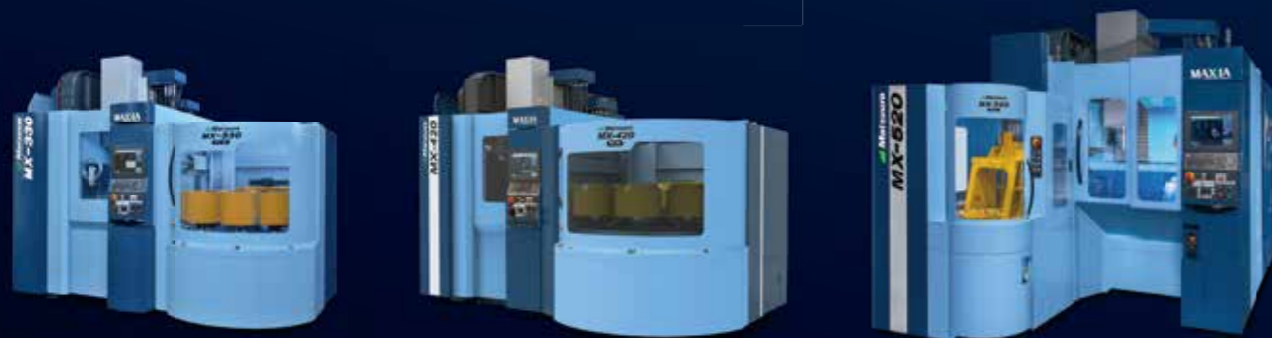
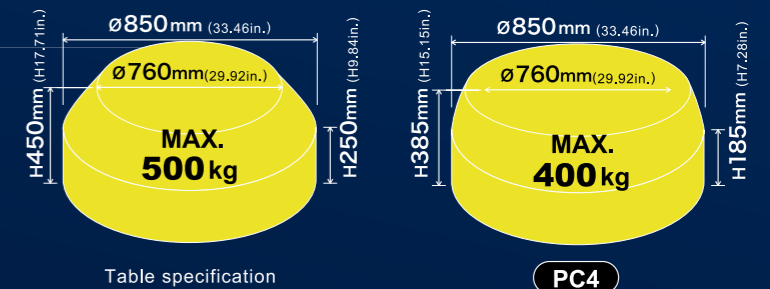
**Proven Automation  
Delivering Maximum Profit**

**2** Productivity Improvement by Efficient Machining Process

**Smooth Transition  
from 3-axis to 5-axis Machining**

**3** Productivity Improvement by Operator Workload Reduction

**Ease-of-use Operability  
for Beginners to Advanced**



PC10 MX-330      PC10 MX-420      PC4 MX-520

### MX Series

#### MX-850

**4** Productivity Improvement by Ensuring Stable and High Accurate Machining  
**Automation Specialized Functions  
for Long Periods of Sustained Machining**

**5** Productivity Improvement by Reduction of Machine Downtime in Manufacturing  
**Visual Control and Remote Monitoring for  
Unmanned Operations at Night and Weekends**

# 1 Productivity Improvement by 24 hours Continuous Operation

## Proven Automation

### Delivering Maximum Profit

#### Automation Package

Compact-design automated system

Matsuura original designed **MX-850** 4 pallet system, combined with 90 tools, delivers optimized and unrivalled spindle utilization and unmanned performance. Matsuura's affordable excellence delivers our legendary & proven automated machining to within reach of all CNC machining companies.

#### PC4 (Floor pallet system)

Pallet storage: Memory random system

Option

#### 90-tool magazine

Option

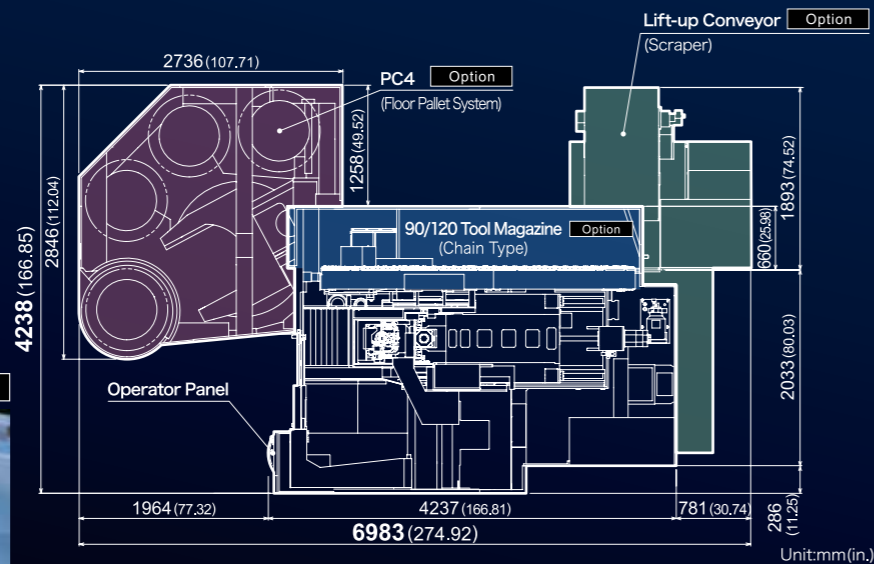


#### Work station

Large APC workstation access



#### Small footprint saving valuable factory space



#### Spiral chip conveyor

30% higher swarf evacuation capacity

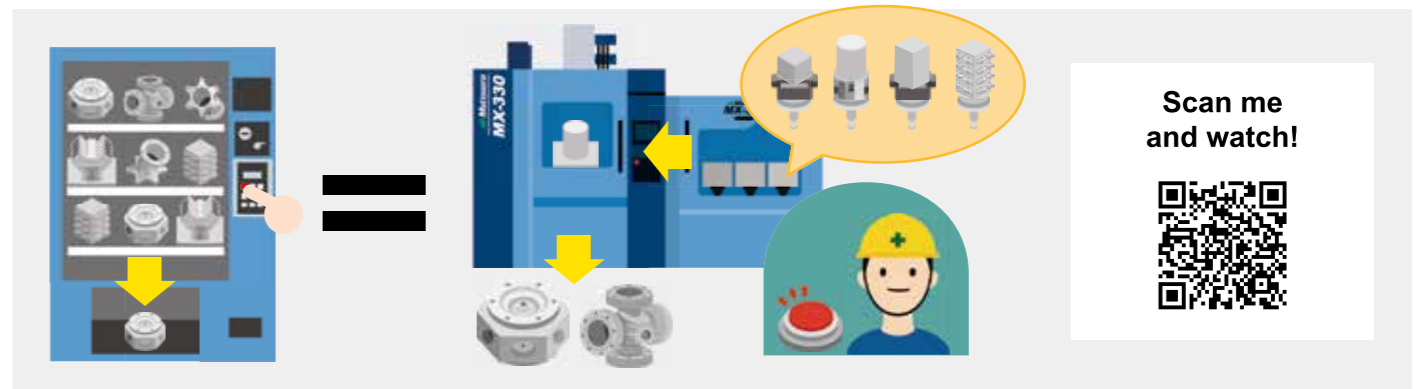
Option



#### Matsuura Original Multi-pallet System Solution

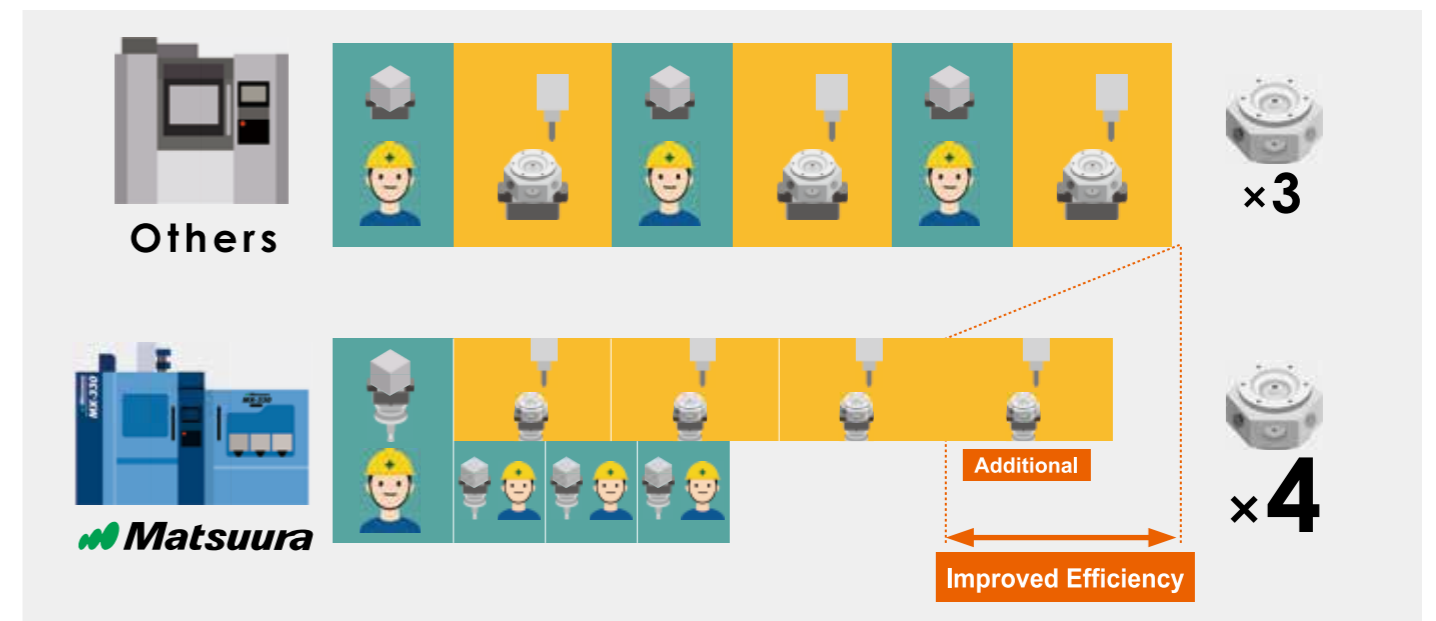
#### High-Mix, Low-Volume Production

Matsuura's multi-pallet solutions allow you leave fixtures on pallets, enabling you to produce the necessary products in the necessary quantity when they become necessary..., like a vending machine!

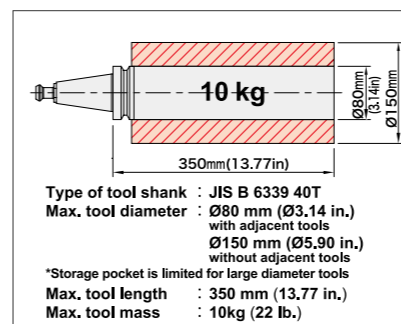


#### Maximize Your Operational Efficiency

Matsuura's multi-pallet solution has a work station, enabling you set up workpieces even during machining. Once you set up workpieces and leave them in the pallet pool, and the machine will automatically start machining in order.



#### Tool specification



#### 60-tool magazine

Standard



#### 120-tool magazine

Option



Floor plan is the same as 90-tool magazine

# 2

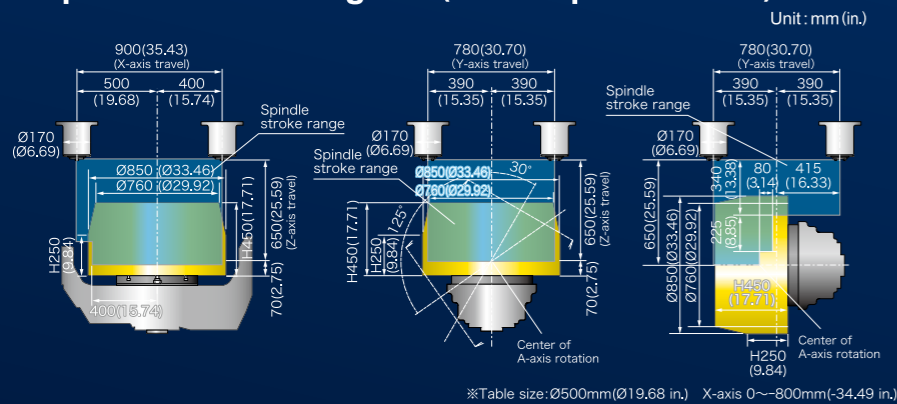
Productivity Improvement by Efficient Machining Process

## Smooth Transition from 3-axis to 5-axis Machining

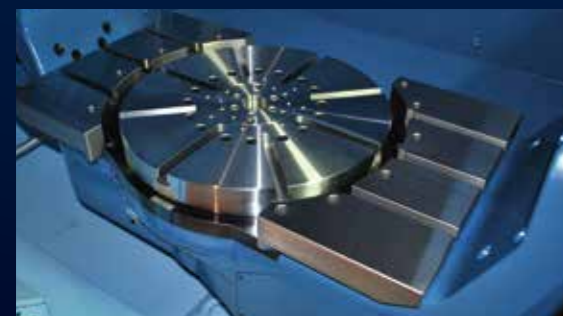
Lower costs, fewer set-ups and eliminated accumulated load errors with 5-axis machining

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

### Spindle Stroke Diagram (Table specification)



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



### Table options that meet all machining needs

The Ø500mm (Ø19.68in) table comes equipped as standard. You can also choose from Ø700mm (Ø27.55in) table or one with an attached flat table (Ø500mm (Ø19.68in)) according to your machining needs.

The photo shows specifications with a flat table (Ø500mm (Ø19.68in)).

Option

### Productivity improvement by cycle time reduction; acceleration of machine movement

Upgrade

The newly-designed **MX-850** achieved a cycle time reduction of 8% (compared to conventional model) by improving the 4/5 axis raid traverse rate to 20/40min<sup>-1</sup> (conventional to 17/33min<sup>-1</sup>) and machine movement performance.

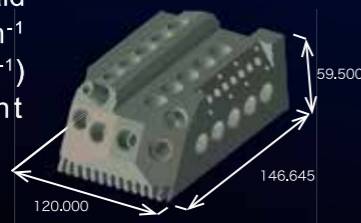


Fig.Cycle time comparison

Material	Aluminum(147x120x60mm)[5.78x4.72x2.36in.]			
Number of tools	12tools			
Spindle speed	2,000~12,000min <sup>-1</sup>			
		<b>Cycle time</b>	<b>Conventional</b>	<b>Model Change</b>
4/5 axis indexing		53min 27sec	50min 21sec	
Simultaneous 5 axis		37min 20sec	33min 32sec	
<b>Total</b>		90min 47sec	83min 53sec	8% Reduction

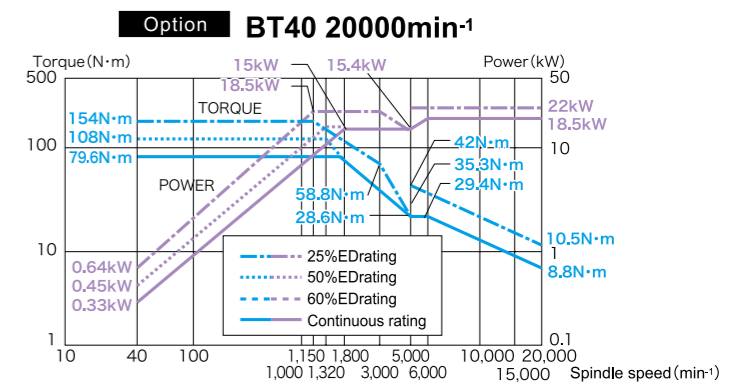
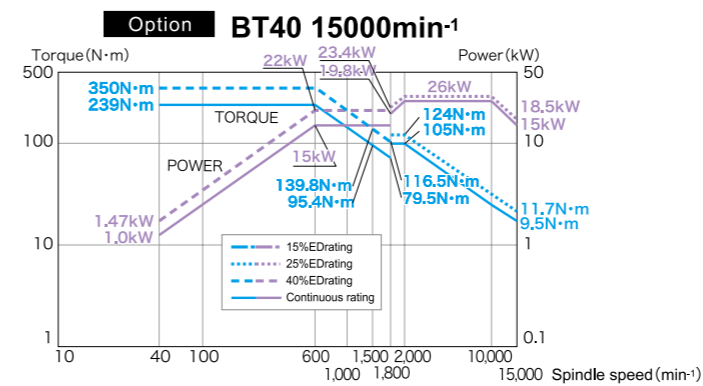
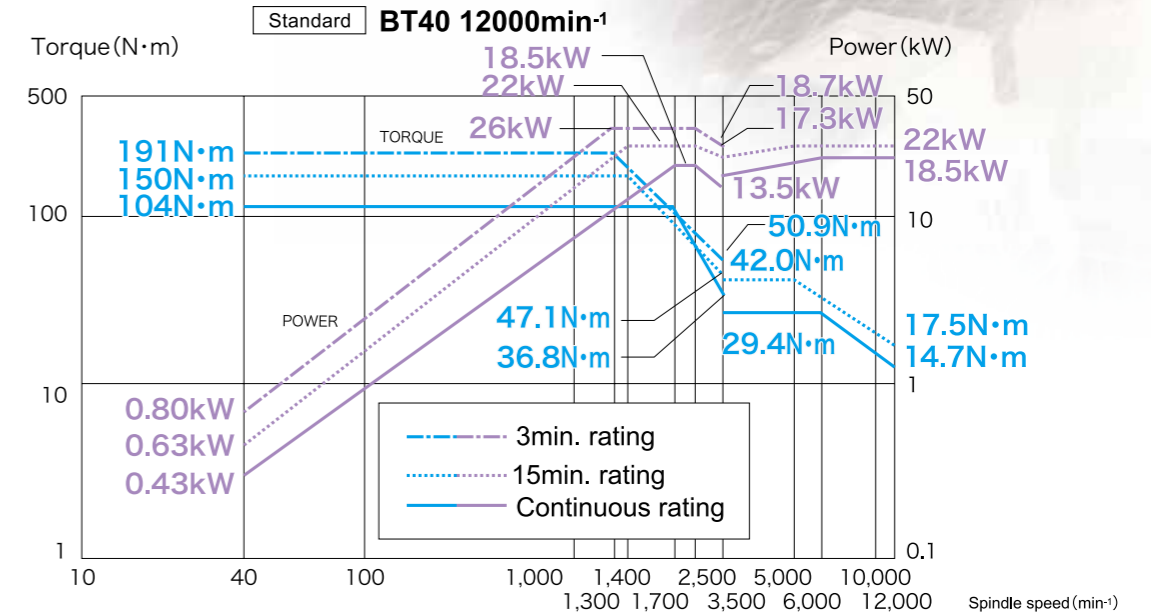
Data is not intended to guarantee the performance.

# MX-850

Step up to 5-axis

## 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.



### Machining test results

BT#40 12000min <sup>-1</sup> (191N·m) Standard					
Part material	Tool size	Spindle speed	Cutting feed rate	Cutting capacity	
Face mill	A5052	Ø80mm (3.14)	W=70mm (2.75) D=5mm (0.19)	5,500 mm/min (314.96)	2,800 cc/min
	S45C	Ø80mm (3.14)	W=70mm (2.75) D=3mm (0.11)	1,120 mm/min (118.11)	630 cc/min
End mill	A5052	Ø25mm (0.98)	W=22mm (0.86) D=6mm (0.23)	10,000 mm/min (393.70)	1,780 cc/min
	S45C	Ø20mm (0.78)	W=3mm (0.11) D=35mm (1.37)	5,000 mm/min (216.53)	578 cc/min
U Drill	A5052	Ø35mm (1.37)		1,500 mm/min (31.49)	769 cc/min
	S45C	Ø35mm (1.37)		1,300 mm/min (13.38)	327 cc/min
Tap	A5052	M36×P4.0		120 mm/min (18.89)	-
	S45C	M30×P3.5		100 mm/min (13.77)	-

BT#40 15000min <sup>-1</sup> (350N·m) Option					
Part material	Tool size	Spindle speed	Cutting feed rate	Cutting capacity	
Face mill	A5052	Ø80mm (3.14)	W=70mm (2.75) D=5mm (0.19)	5,500 mm/min (433.07)	3,850 cc/min
	S45C	Ø80mm (3.14)	W=70mm (2.75) D=3mm (0.11)	1,120 mm/min (118.11)	630 cc/min
End mill	A5052	Ø25mm (0.98)	W=22mm (0.86) D=10mm (0.39)	10,000 mm/min (393.70)	2,200 cc/min
	S45C	Ø20mm (0.78)	W=3mm (0.11) D=35mm (1.37)	5,500 mm/min (255.90)	683 cc/min
U Drill	A5052	Ø35mm (1.37)		1,500 mm/min (31.49)	769 cc/min
	S45C	Ø35mm (1.37)		1,300 mm/min (12.99)	317 cc/min
Tap	A5052	M42×P4.5		100 mm/min (17.71)	-
	S45C	M42×P4.5		100 mm/min (17.71)	-

BT#40 20000min <sup>-1</sup> (108N·m) Option					
Part material	Tool size	Spindle speed	Cutting feed rate	Cutting capacity	
Face mill	A5052	Ø80mm (3.14)	W=70mm (2.75) D=4mm (0.15)	5,500 mm/min (314.96)	2,240 cc/min
	S45C	Ø80mm (3.14)	W=70mm (2.75) D=2mm (0.08)	1,320 mm/min (110.23)	392 cc/min
End mill	A5052	Ø25mm (0.98)	W=22mm (0.86) D=6mm (0.23)	20,000 mm/min (472.44)	1,584 cc/min
	S45C	Ø20mm (0.78)	W=3mm (0.11) D=30mm (1.18)	5,000 mm/min (196.85)	450 cc/min
U Drill	A5052	Ø30mm (1.18)		1,800 mm/min (27.55)	495 cc/min
	S45C	Ø27mm (1.06)		1,500 mm/min (12.59)	183 cc/min
Tap	A5052	M30×P3.5		120 mm/min (16.53)	-
	S45C	M24×P3.0		100 mm/min (11.81)	-

# 3

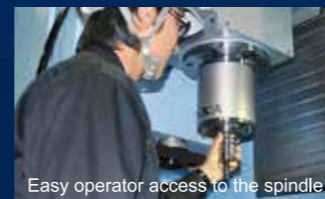
Productivity Improvement by Operator Workload Reduction

## Ease-of-use Operability for Beginners to Advanced



### Designed for sustained performance

Accessibility to workpiece and spindle



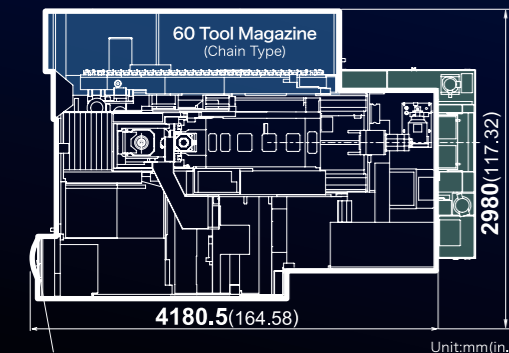
- ① Front door opening width:  
1055mm [41.53in.] (with table)  
880mm [34.64in.] (with pallet)
- ② Distance from machine front to table center:  
500mm [19.68in.]
- ③ Distance from floor to table top surface:  
910mm [35.82in.] (with table)  
975mm [38.38in.] (with pallet)

### PC4 Work station (rotary) Option

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

### Designed as installed even in the space of a 3-axis machine

Self-developed compact design



### Designed for easy crane access

A sliding roof cover, incorporating a proven Matsuura design, affords the operator a spacious 435mm roof opening for loading billets safety by crane.



### Designed for easy maintenance

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



## Easy Operation

Maximum functionality and optimized performance

## MIMS

Matsuura Intelligent Meister System



- Secure**

### Reliability Meister

Reduced machine downtime

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

### Operability Meister

Hassle-free, simple operation

  - Tool setup support
  - Workpiece setup support
- Accuracy**

### Thermal Meister

Stable accuracy

  - Spindle thermal displacement compensation
  - Feed axis thermal displacement compensation Option
  - Environmental thermal displacement compensation Option
- Environment**

### Eco Meister

Eco mode

Power savings

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

## Tool/pallet management and Electronic manuals all managed on the NC screen

### Operation panel

#### Matsuura G-Tech 31i

(iHMI, 15-inch touch panel type)

Usability is drastically upgraded with context-sensitive screen icons and quick screen displays.



## 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.
- ▶ Time and frequency of usage is updated on the tool table after tool change. Once the current tool life value exceeds the set value a warning is displayed.
- ▶ Spare tools can be set using the same T number. A spare tool is automatically selected once a tool's life has expired.

## 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.
- ▶ Pallet management screen is designed for easy operation and flexible production.



# 3 Productivity Improvement by Operator Workload Reduction Ease-of-use Operability for Beginners to Advanced

**MX-850**  
Operability

## Intelligent Protection System

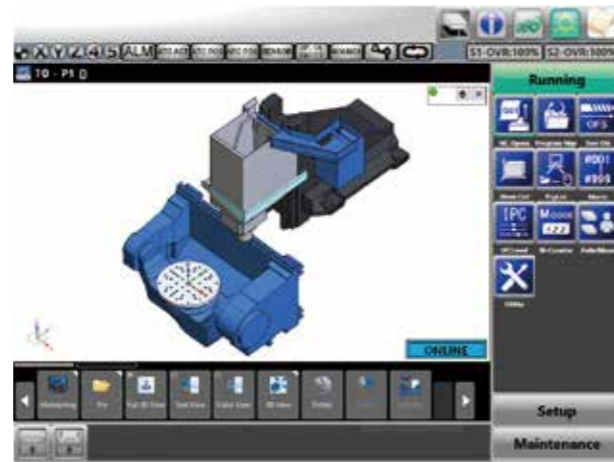
Standard

### Collision prevention function

The collision prevention function developed solely by Matsuura. It prevents machine collisions due to programming errors un 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 as an option. Model data of stock, tools, etc. can be created in the office in advance.

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

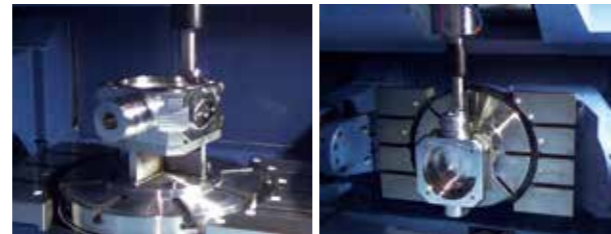


## Synchro Tip + Orbit machining

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 chip. Since turning and machining can now be done in one process no additional setup time is required for the turning process.



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

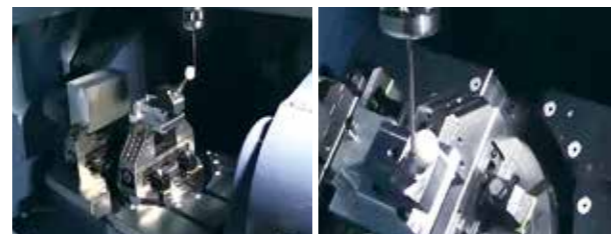
\* Orbit function

## eZ-5

Option

### Advanced 5-axis error measurement and correction

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.



### Automatic measurement (interactive)

Option

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

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



Blum

Renishaw

**MX-850**  
Reliability

# 4 Automation Specialized Functions for Long Periods of Sustained Machining

Spindle

Environment  Option

Feed axes  Option

### Thermal displacement compensation

The thermal 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 with no scale feedback specification.

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

### Tool pre-check Option

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

### Tool breakage detection Option

Improve measurement accuracy by adopting Integrated type mounted to C-axis frame.  
Max. tool diameter: Ø150mm (Ø5.90 in.)  
Max. tool length: 350mm (13.77in.)



Contact type

### Automatic workpiece conveyors using robotics

- ▶ Robotic interface  Option
  - \* Enable connections to external workpiece conveying machines
- ▶ Automatic door  Option
  - \* Automatically opens and closes the operator door
- ▶ Pressure supply system for fixtures  Option
  - \* Supplies pressure to the auto clamping device for the workpiece

### Environmental protection by power consumption reduction **NEW**

- ▶ Power off function
- ▶ Auto power off function
- ▶ ECO drive function
- ▶ Lighting inside machine & Main screen turn-off function
- ▶ ECO mode



# 4

Productivity Improvement by Ensuring Stable and High Accurate Machining

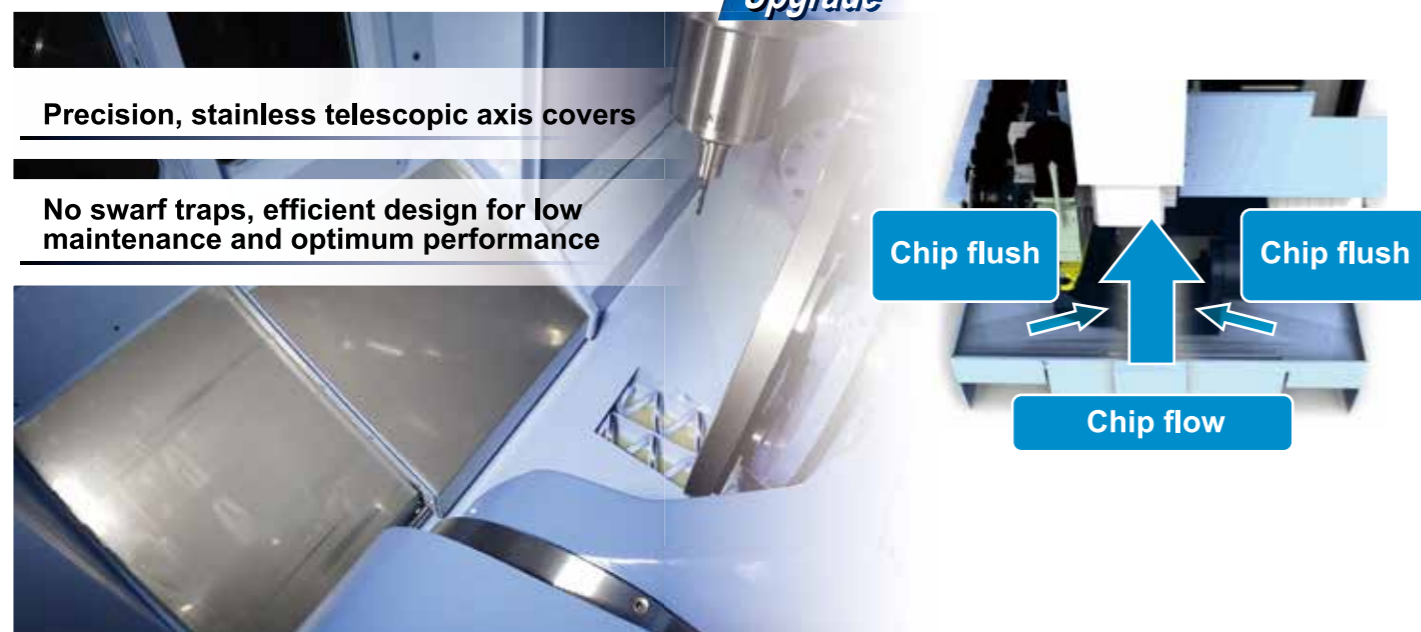
## Automation Specialized Functions for Long Periods of Sustained Machining

# MX-850

Reliability

### Reliable chip removal

Upgrade



### Lift-up chip conveyor with drum filter

Option

### Spiral chip conveyor 2 sets

Option



\* Chip bucket is an option

### Coolant management system

Option

NEW

No need to manage or replenish coolant by visualizing the state of coolant in the machine (amount of coolant, temperature, concentration, pH value) and automatically supplying the required amount of coolant.



# MX-850

Visual Control

# 5

Productivity Improvement by Reduction of Machine Downtime in Manufacturing

## Visual Control and Remote Monitoring for Unmanned Operations at Night and Weekends

### Operation Status Monitoring

Standard

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

▶ Performance is monitored to check OEE.

\* Overall equipment efficiency (OEE) = availability x performance x quality

\* The storage period is one month. Data for one year can be saved as an option.



Operational state display



Overall operation ratio display

### Matsura Remote Monitoring System

Option

NEW

- ▶ It is possible to monitor the operating status of multiple machines even from a distance.
- ▶ Machine operation history can be checked (both display or machine unit display).
- ▶ Pallet schedule can be edited even when away from the machine.



Multiple machines operating status



Individual machine operating status

### MTConnect

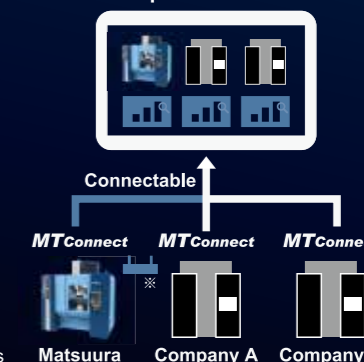
Option

MTConnect is an open communication protocol for the manufacturing industry. MTConnect 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

MTConnect compatible visualization system

NEW



\* Support for both wireless and wired LANs

# MX-850 Specification / Equipment

## Standard Machine Specifications

Movement and Range		
X-axis travel	[mm (in.)]	900 (35.43")
Y-axis travel	[mm (in.)]	780 (30.70")
Z-axis travel	[mm (in.)]	650 (25.59")
A-axis rotation angle	[deg]	-125 ~ +30
C-axis rotation angle	[deg]	360
Table		
Working surface	[mm (in.)]	Ø500 (19.68")
Loading capacity	[kg (lb.)]	500 (1100)
Max. workpiece size	[mm (in.)]	Ø760×H450 (Ø29.92"×H17.71") Ø850×H450 (Ø33.46"×H17.71") (with restrictions)
Spindle		
Spindle speed	[min <sup>-1</sup> ]	40 - 12000 (grease lubrication)
Spindle speed change command		S5 digits direct command
Spindle taper		7/24 taper BT40 (BT double contact type)
Spindle bearing inner diameter	[mm (in.)]	Ø80 (3.14")
Max. spindle motor torque	[N·m]	191 / 1300min <sup>-1</sup>
Feed Rate		
Rapid traverse rate	X/Y/Z [mm (in.)/min]	40000/40000/40000 (1574.8)
	A/C [min <sup>-1</sup> ]	20/40
Feedrate	X/Y/Z [mm (in.)/min]	1 - 40000/1 - 40000/1 - 40000 (0.03 - 1574.8)
	A/C [min <sup>-1</sup> ]	20/40
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

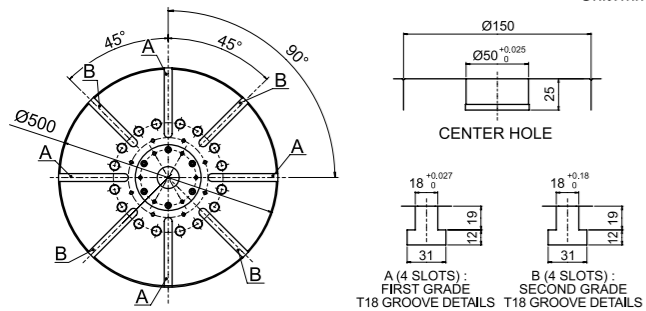
## List of Fittings

Spindle		
12000min <sup>-1</sup> (BT40 grease lubrication)		○
15000min <sup>-1</sup> (BT40 grease lubrication)		○
Spindle motor output	kW	15/30
Max. spindle torque	N·m	350
20000min <sup>-1</sup> (BT40 auto grease lubrication)		▲
Spindle motor output	kW	15/18.5
Max. spindle torque	N·m	108
20000min <sup>-1</sup> (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		
Ø500mm		○
Ø700mm		▲
Ø500mm + Flat table		▲
Pallet Changer System		
PC4 (floor pallet system) **		▲
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 <sup>-1</sup> spindle)		▲
Environmental thermal displacement compensation (15000min <sup>-1</sup> spindle)		▲
Environmental thermal displacement compensation (20000min <sup>-1</sup> spindle)		▲
Coolant		
Coolant unit		○
Vacuum-type coolant through A 7MPa		▲
Vacuum-type coolant through A 14MPa		▲
Vacuum-type coolant through B 7MPa		▲
Vacuum-type coolant through B 14MPa		▲
Vacuum-type coolant through C 2MPa		▲
Vacuum-type coolant through C 7MPa		▲
Mist Separator unit (without fire damper)		▲
Mist Separator unit (with fire damper)		▲
Coolant temperature controller with tank 100L		▲

## Ø500mm Table top view

Standard

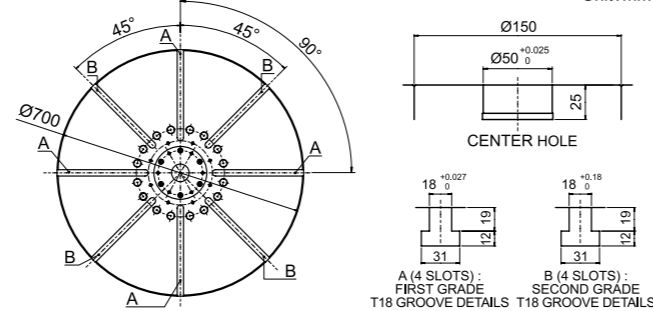
Unit: mm



## Ø700mm Table top view

Option

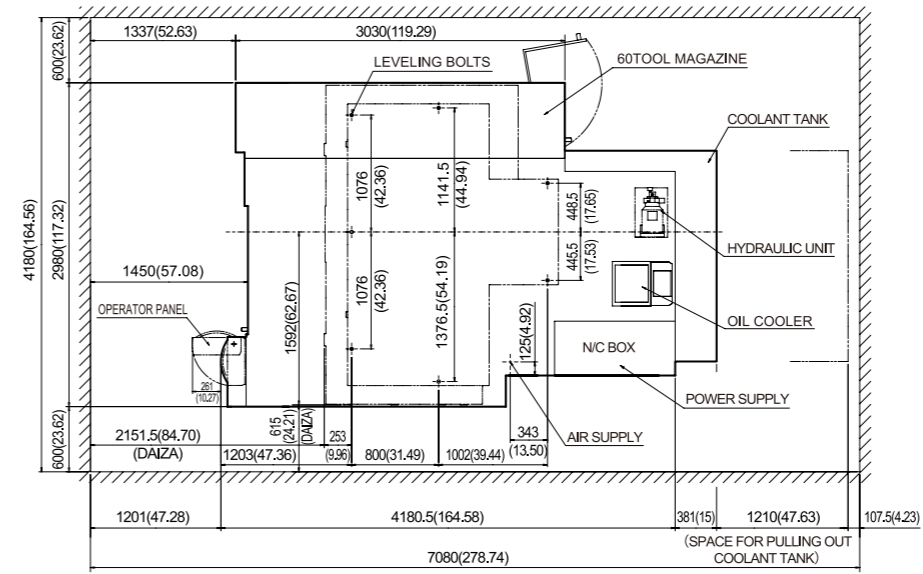
Unit: mm



## MX-850 Floor plan

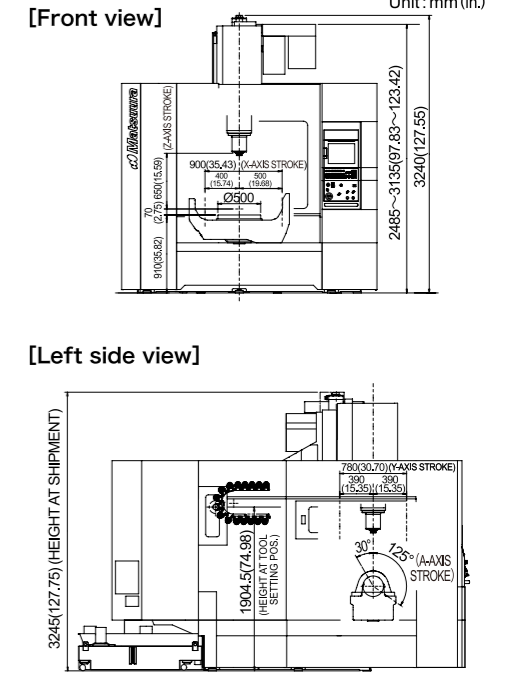
Standard

Unit: mm (in.)



## MX-850 External view

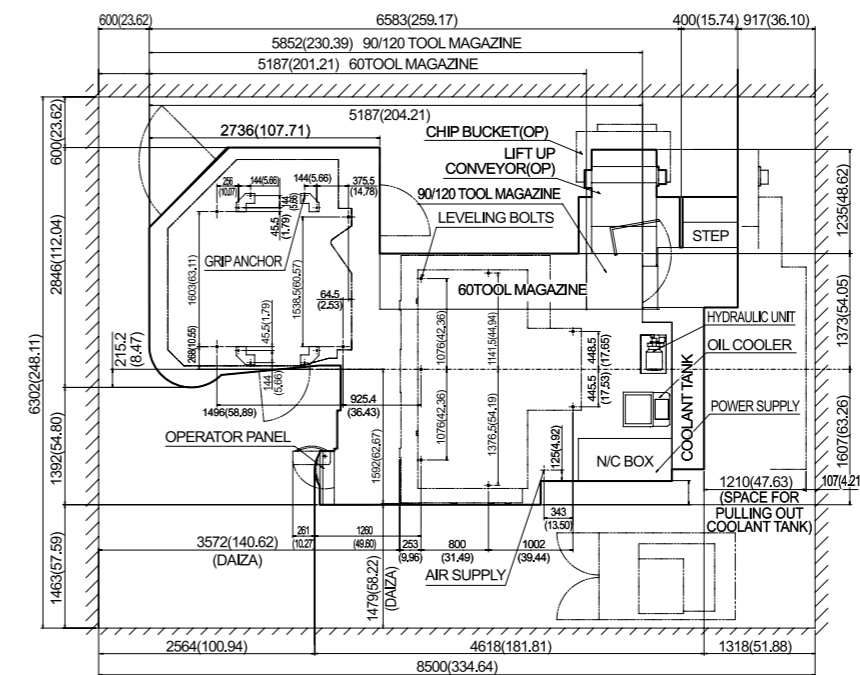
Unit: mm (in.)



## MX-850 PC4 Floor plan

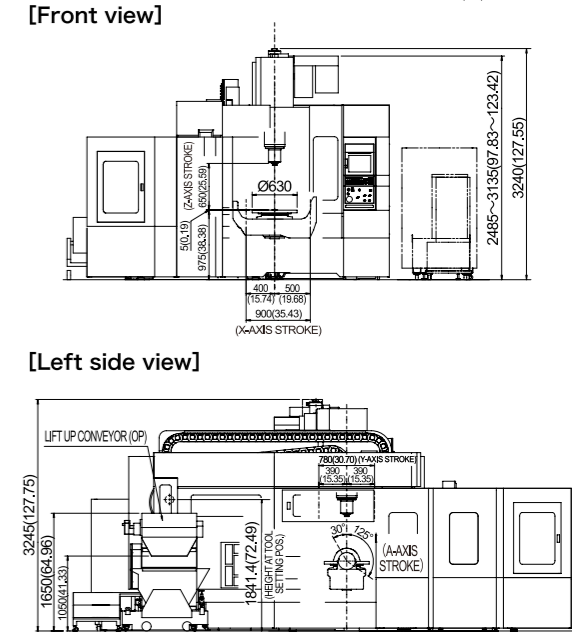
Option

Unit: mm (in.)



## MX-850 PC4 External view

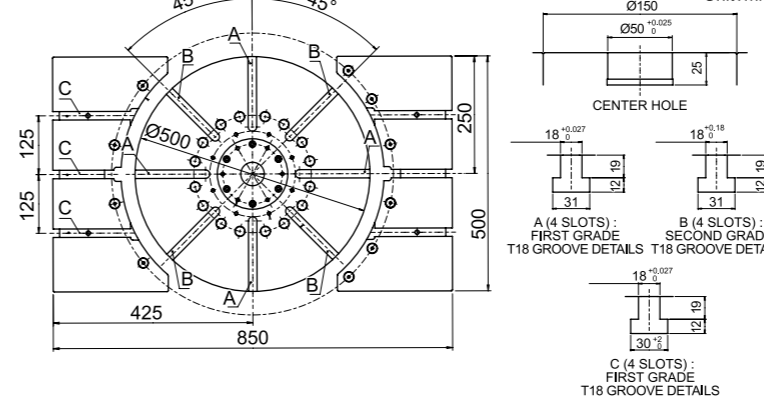
Unit: mm (in.)



## Ø500mm + Flat Table top view

Option

Unit: mm



## Pallet top view

Option

Unit: mm (in.)

