

 **Matsura**

High Speed Linear Motor Machine

LS-160



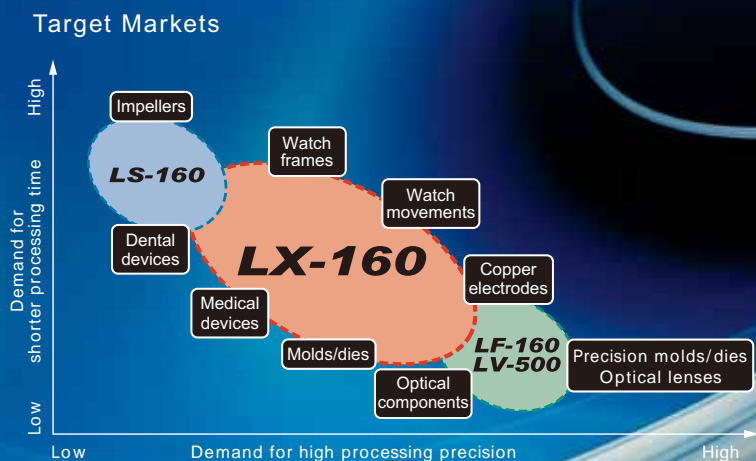
MAXIA
Innovation by  Matsura

Matsuura LS-160

Ultra High Speed 5 Axis Machining

Unerring accuracy, the highest quality finish in the shortest cycle time possible

- Technology leading platform for complex geometric components
- Industry example: Impellor machining times are drastically reduced on the **LS-160**
- Incorporating our proven and globally renowned Matsuura **MAXIA** Spindle Technology





MAXIA
Innovation by  Matsuura

One Hit 5 axis machining, linear drives and 40,000 performance dramatically reducing cycle times

Industry example; The **LS-160** creates impellers at remarkable speed – guaranteeing reduced cycle times with no accuracy or quality loss



Size	112 mm (4.40 in.)	80 mm (3.14 in.)	64 mm (2.51 in.)	44 mm (1.73 in.)
Material	Aluminum A2017	Aluminum A2017	Aluminum A2017	Aluminum A2017
Blade (pcs)	7	6	6	6
Cutting Method	Flank Cut	Flank Cut	Flank Cut	Flank Cut
Machining Time	15 min 5 sec	9 min 34 sec	5 min 27 sec	1 min 50 sec

Matsura L-Tech840Dsl controller installed

The L-Tech 840Dsl controller equipped with abundant functions can handle various machining applications that require high speed, high precision, and high quality.

Optimized acceleration/deceleration

Parameter settings : CYCLE832

The high-speed setting function, "Advanced Surface", enables free-curve machining data settings to achieve optimal machining.

Optimized smoothing tolerance

Tool vector smoothing function : ORISON

By smoothing tool vectors across multiple blocks, vibrations that might affect the rotary motion can be reduced, making both rotary and contouring motions smooth.

Tool path optimization

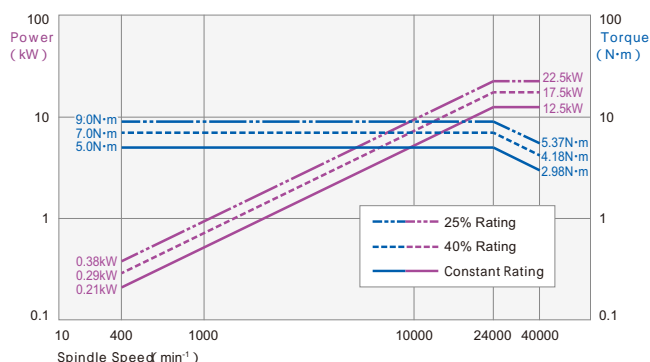
CAM specific to impeller machining

By using the tool side edge cutting algorithm, straight line element surface design and tool side edge cutting method can reduce your machining costs. The entire surface of each vane can be finished in a single tool path motion.

Matsura MAXIA Spindle Technology – world leaders

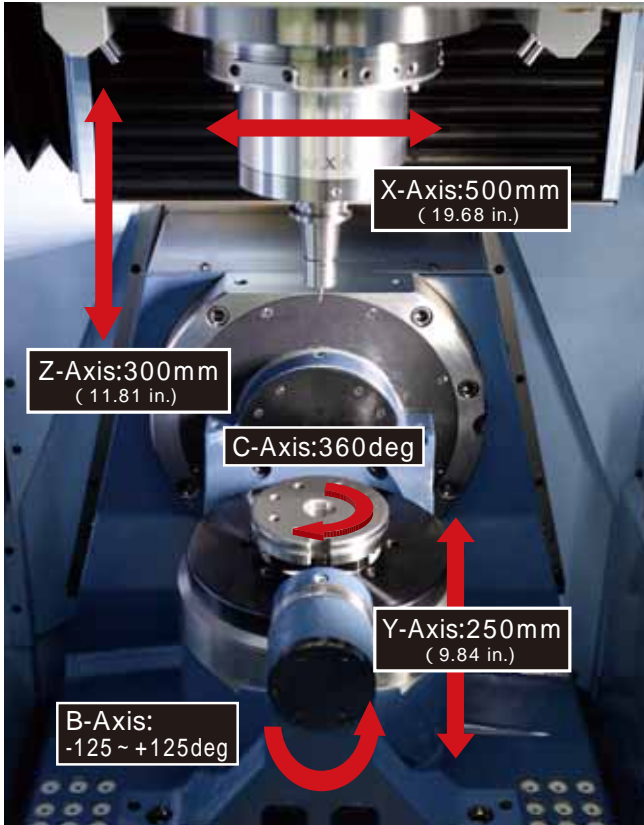
Spindle Speed	min ⁻¹	400 ~ 40,000
Type of Spindle Taper Hole	-	HSK-E40
Spindle Motor	kW	12.5 / 22.5
Max. Spindle Torque	N·m/min ⁻¹	9 / 24,000

Spindle Motor Torque & Power Diagram



min⁻¹ spindle – effortless

X-/Y-/Z-axis linear motors and
B-/C-axis DD motors



Rapid Traverse Rate

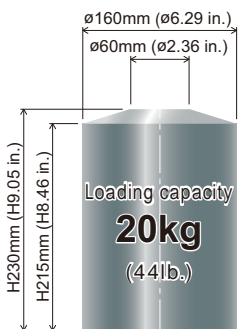
X-Axis 90,000mm/min
(3543.3 ipm)
Y-Axis 90,000mm/min
(3543.3 ipm)
Z-Axis 90,000mm/min
(3543.3 ipm)

B-Axis 100min⁻¹
C-Axis 200min⁻¹

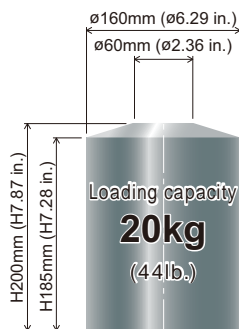
Table Rotation Torque

B-Axis 64.8N·m C-Axis 13N·m

Maximum Workpiece Size *Bullet shape

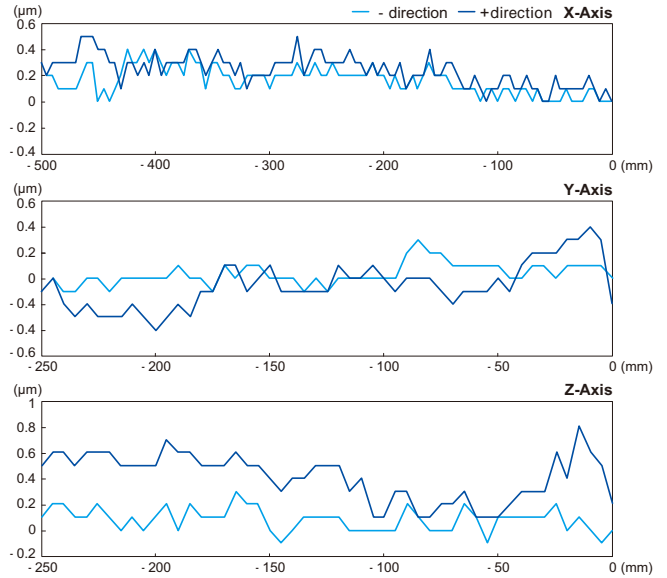


Standard without pallet changer



Option with pallet changer

Positioning accuracy of each axis



*The measurement results are actual values but not guaranteed values.

Cutting Test Data

	Work material	Tool	Cut width Cut depth	Spindle speed	Feed rate	Removal rate
	A5052	Ø50mm (1.96) 3blades	W=40mm (1.57) D=1.5mm (0.05)	6,000 min ⁻¹	5,500 mm/min (216.53)	330 cc/min
	S45C	Ø63mm (2.48) 5blades	W=50mm (1.96) D=0.5mm (0.019)	1,500 min ⁻¹	700 mm/min (27.55)	17.5 cc/min
	A5052	Ø16mm (0.62) 2blades	W=14mm (0.55) D=3mm (0.11)	40,000 min ⁻¹	16,000 mm/min (629.92)	672 cc/min
	S45C	Ø16mm (0.62) 4blades	W=1mm (0.03) D=16mm (0.62)	6,000 min ⁻¹	5,000 mm/min (196.85)	80 cc/min

	Work material	Tool	Spindle speed	Feed rate	Removal rate
	A5052	Ø14.5mm (0.57)	1,300 min ⁻¹	120 mm/min (4.72)	19.8 cc/min
	S45C	Ø6.8mm (0.26)	900 min ⁻¹	80 mm/min (3.14)	2.90 cc/min
	A5052	M12 × P1.75	400 min ⁻¹	700 mm/min (27.55)	
	S45C	M8 × P1.25	400 min ⁻¹	500 mm/min (19.68)	

Note: The data above is from examples of actual results. Depending on conditions, there may be cases where results equivalent to those of the catalog data may not be able to be obtained.

Standard Machine Specifications

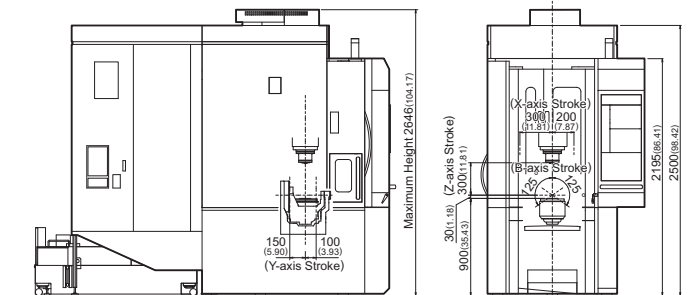
Movement and Range		
X-Axis Travel	mm(in.)	500 (19.68)
Y-Axis Travel	mm(in.)	250 (9.84)
Z-Axis Travel	mm(in.)	300 (11.81)
B-Axis Travel	deg	-125 ~ +125
C-Axis Travel	deg	360
Table Surface to Spindle End	mm(in.)	30 ~ 330 (1.18 ~ 12.99) (B-Axis 0 degree)
B-axis Centre to Spindle End	mm(in.)	0 ~ 300 (0 ~ 11.81)
B-axis Centre to Table Surface	mm(in.)	-30 (-1.18)
Table		
Working Surface	mm(in.)	Ø100 (3.93)
Loading Capacity	kg(lb.)	20 (44)
Max. Work Size	mm(in.)	Ø160 x H230 (Ø6.29 x H9.05) *Bullet shape
Height from Floor surface to table surface	mm(in.)	900 (35.43) (B-Axis 0 degree)
Spindle		
Spindle Speed	min ⁻¹	400 ~ 40,000
Type of Spindle Taper Hole		HSK-E40
Spindle Motor Power	kW	AC 12.5 / 22.5
Max. Spindle Motor Torque	N·m/min ⁻¹	9 / 24,000
Feed Rate		
Rapid Traverse Rate (X/Y/Z)	mm/min(ipm)	90,000(3,543.3)
Rapid Traverse Rate (B)	min ⁻¹	100
Rapid Traverse Rate (C)	min ⁻¹	200
Automatic Tool Changer		
Type of tool shank		HSK-E40
Type of retention knob		HSK-E40
Tool Storage Capacity	pcs.	10
Max. Tool Diameter	mm(in.)	Ø46 (Ø1.81)
Max. Tool Length	mm(in.)	150(5.90)
Max. Tool Mass	kg	1.5 (3.3) (incl. Holder)
Power Sources *Depending on options		
Power Capacity	kVA	63(depends on the optional features)
NC System		
Control System		Matsura L-Tech 840Dsl

Standard Accessories	
01. Total Splash Guard	02. ATC Magazine Guard
03. ATC Auto Door	04. Spindle Oil Cooler
05. Auto Grease Supply to Feed Axis	06. Matsuura Safety Specification
07. Air Dryer	08. Synchronized Tapping
09. Coolant Unit	10. Chip Flush
11. Chip Flow	12. Linear Motor Cooler
13. 9 Sorts of M-code Counters	14. Spindle Thermal Displacement Compensation
15. Work Light	16. Standard Mechanical Tool and Tool Box
17. Machine Color Paint	18. Leveling Pads and Bolts
19. Scale Feedback for the X/Y/Z/B/C-Axis	HEIDENHAIN (absolute)

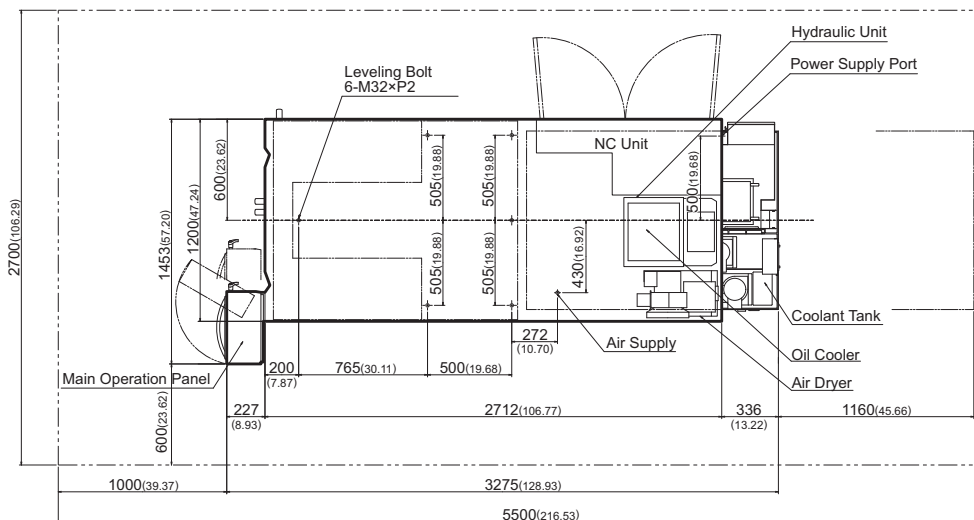
Outline 10-tool Magazine non-PC (Unit : mm(inch))

Left Side View

Front View



Floor Plan 10-tool Magazine non-PC (Unit : mm(inch))



Equipment

: Standard : Option

Spindle	
40,000 min ⁻¹ (HSK-E40)	
ATC with the inclusion of the standard 10-tool magazine	
30 tools (HSK-E40, chain type)	
50 tools (HSK-E40, chain type)	
High Accuracy Control	
Scale Feedback for the X/Y/Z/B/C-Axis HEIDENHAIN (absolute)	
APC	
PC2(Max. Work Size 160mm X H200mm *Bullet shape)	
Coolant	
Cutting Oil Tank	
Vacuum Type Coolant-Thru-Spindle Type A	
Vacuum Type Coolant-Thru-Spindle Type B	
Vacuum Type Coolant-Thru-Spindle Type C 20BAR	
Coolant Flow Checker	
Mist Separator (without Fire Damper)	
Mist Separator (with Fire Damper)	
Cutting Oil Temperature Controller (with 100L Tank, separate type, small)	
Automatic Measurement / Broken Tool Detection	
Automatic Measurement / Automatic Centering (optical sensor)	
Broken Tool Detection / Full-Automatic Tool Length Measurement (laser sensor)	
Automatic Measurement (optical sensor) & Broken Tool Detection (laser sensor)	

Swarf Management	
Total Splash Guard	
ATC Auto Door	
Spiral Chip Conveyor	
Chip Flush	
Lift-up Conveyors (Scraper, Drum, Right and Left Spiral Conveyors)	
Air Blow For Chip / Swarf Removal	
Workpiece Cleaning Gun (Machine side)	
Operation / Maintenance	
Auto Grease Supply to Feed Axis	
Work Light	
Spindle Run Hour Meter	
Automatic operation runhour meter	
8 Sets of Extra M Function	
Weekly Timer	
Optional Block Skip 2 ~ 9	
Safety Features	
Matsura Safety Specification	
High-Speed, High-Precision Package	
High-Speed, High-Precision Package	

ATC magazine

Option

30/50-Tool Chain Magazine

When a chain type magazine is added on the left side of the machine, a maximum of 50 tools can be stored. This magazine is compactly designed with a width of 300 mm.



APC magazine

Option

PC2

A PC2 option can be added to the right side of the machine. Compactly designed, with an installation width of only 220 mm. Pallet clamp mechanism can be either of System 3R or EROWA.



Pallet Surface

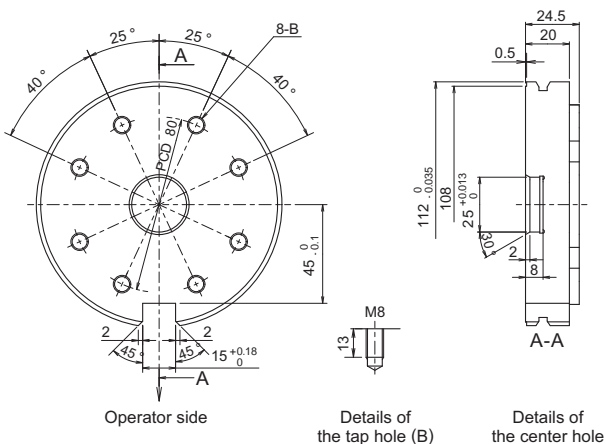
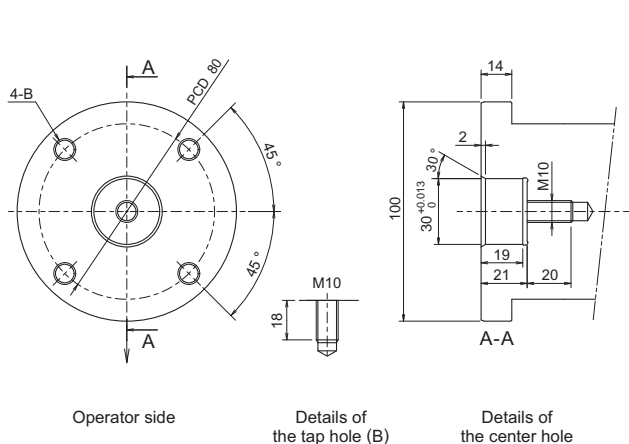


Table Surface





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