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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

VEGETABLE OIL INK

FM-E1.1 201611 1000 B S

Matsuura

5-Axis Multi-Tasking Machining Center

CUBLEX-35

MAXIA
Innovation by Matsuura

Matsuura CUBLEX-35

Advanced, high precision multi-tasking for sustained unmanned production

CUBLEX; The Ultimate Platform for Process Integration

Milling, turning and grinding on one state of the art machine tool, offering more versatile unmanned production from a compact footprint. Set-up time and acummulated errors between different operations are eliminated. Higher accuracy, more production, reduced manpower costs & faster times to market are all realised by investors in the Matsuura ***CUBLEX-35***.

Milling + turning + grinding* incorporated in one machine

In addition to 5-axis milling capabilities, turning and grinding* functions are incorporated in one machine.This "Ultimate Process Integrating Machine" is developed based on an innovative idea greatly differing from lathe-based turning centers. * Option

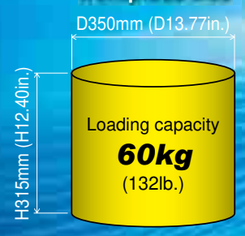
Extended unmanned running with single chucking operation

Based on the market leading ***MAM72-35V*** multi pallet 5 axis, the ***CUBLEX-35*** takes this globally renowned & respected format to new heights of productive excellence, with one chucking turning & grinding added to the unrivalled 5 axis performance of Matsuura. As with the ***MAM72-35V***, reliable, profitable & sustained unmanned performance is assured.

Irregular-shaped, rectangular and thin workpieces supported

Irregular component shapes and those possessing thin walled characteristics are effortlessly accommodated by the ***CUBLEX-35***, as are difficult to chuck rectangular shaped components.

Maximum workpiece size



See page 11 for conditions on the maximum part size.

320-tool magazine + PC2 specification

MAXIA
Innovation by Matsuura

Milling + Turning + Grinding* Incorporated in One Machine

* Option

C-axis Drive with a DD Motor High-speed Chuck Rotation at 3,000 min^{-1} Available with Turning and Grinding

Extraordinary process integration achieves cycle time reduction and cost effective high-precision production.

No setup or alignment between processes is required. One-chucking operation eliminates errors accumulated from setups and enables high-precision machining in unmanned operation for extended durations.

5-axis process — "No setup change" Multi-face machining

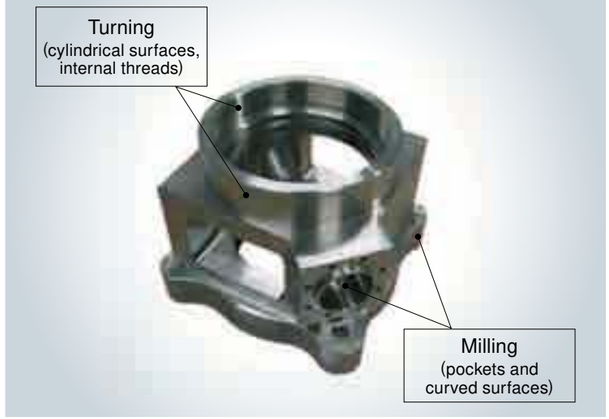
▼

Multi-tasking — Milling + turning + grinding

▼

Unmanned — Multiple workpieces / tools storage Extended unmanned operation

Chamber



Conventional (lathe + 5-axis MC)

2 + 2 = 4 Process

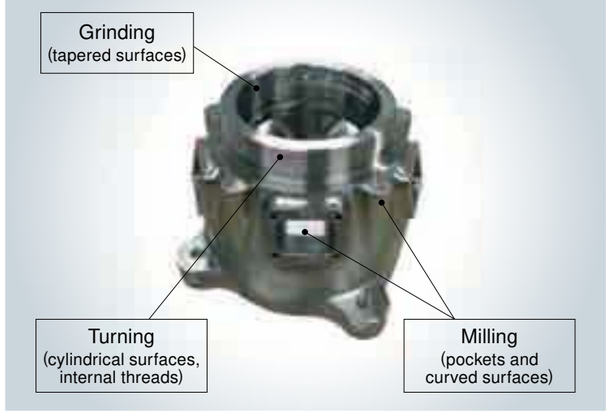
▼

CUBLEX-35

2 Process (50% reduction)

Tools used	6 tools (turning) + 11 tools (milling)
Material	CENA1 (HRC40)

Crank case



Conventional (lathe + 5-axis MC)

2 + 2 = 4 Process

▼

CUBLEX-35

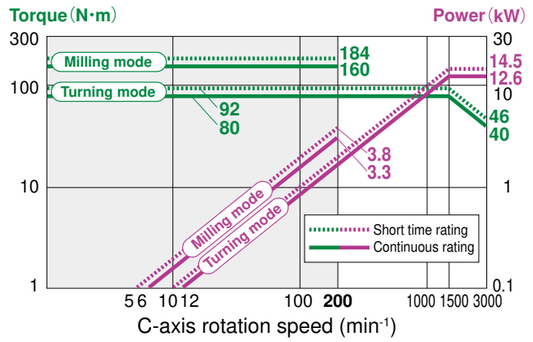
2 Process (50% reduction)

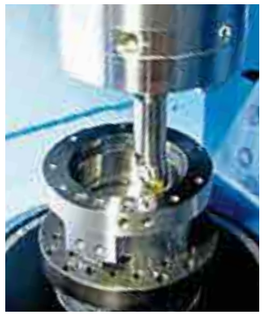
Tools used	6 tools (turning) + 12 tools (milling) + 1 tool (grinding)
Material	CENA1 (HRC40)

Turning spindle

High speed, high accuracy C-Axis positioning in Milling mode (maximum spindle speed is 200 min^{-1}) and high speed chuck rotation in turning mode (3,000 min^{-1}) – the highest speeds in their class, on one machine tool platform. A dedicated oil cooler is integrated into the machine as a standard feature, assuring accuracy, repeatability & reliability.

■ C-axis motor power & torque diagram





Vertical turning

Horizontal turning

Internal grinding

End face grinding

Matsuura OEM "Imbalance Check Function" – stability assured during turning / grinding operations

Imbalance check function

Ensuring perfect balance in relation to a components rotation centre is effortless with Imbalance Check Function" – developed by Matsuura especially for ***CUBLEX*** Series machines. As well as perfect balance, this superb function will also inform the operator of the safest rotational speed that can be utilised with any given component.

[Flying prevention function]

This function monitors the extent of imbalance during turning, and if exceeding the set level, stops the machine to avoid damaging the components.

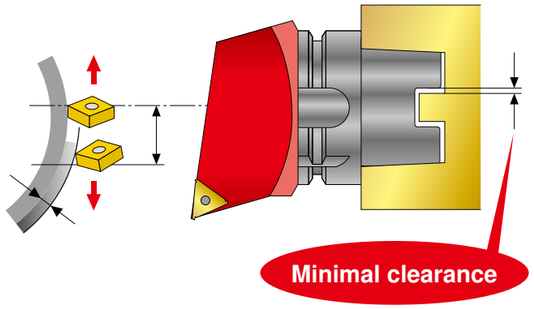
[Imbalance check function]

The extent of imbalance is measured and the correction information (balance weight / balancing position) is transmitted for feedback.

Tooling System for Multi-Tasking Machines

HSK ICTM standard

ICTM is based on the HSK standard for multi-tasking machining centres. ICTM / HSK is included & recognised in both JIS & ISO Standards.
Reduced clearance between the spindle drive key & the tool holder keyway ensures sustained turning accuracy, and two face clamping assures high rigidity against the cutting force generated during turning.



Multi-faceted tooling

Multi-faceted tooling is usable since the spindle can be locked at any phase position. For example, when using a triple insert cutter, the spindle can be locked at 120-degree increments, enabling three kinds of turning operation within one operation setup. In addition, the amount of tool offset can be configured for each insert on the tool management screen.
This reduces tool change times and the need for extra tool holders.

Proven spindle lock mechanism

The Matsuura Spindle posesses an integrated and robust drum brake mechanism. This proven spindle lock system contributes greatly to sustainable high accuracy turning.

MAXIA Spindle for High-speed High-precision 5-axis Machining

Proven MAXIA spindle

MAXIA spindles are renowned worldwide for precision, rigidity & low noise. High-speed high-precision machining is available with a vast spectrum of materials from aluminum to hard-to-cut materials.

Spindle lubrication with grease

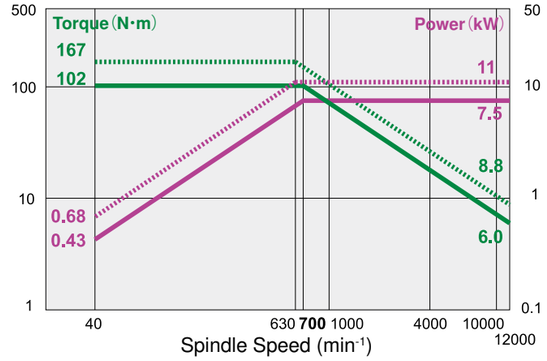
Grease spindle lubrication system is employed for environmental protection and labor saving.

Spindle nose diameter reduced by 20 mm from existing models

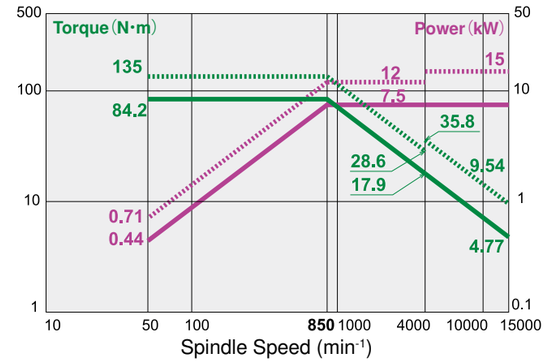
The collision area during simultaneous 5-axis machining is reduced, enabling greater freedom in machining operation.

■ Spindle motor power & torque diagram

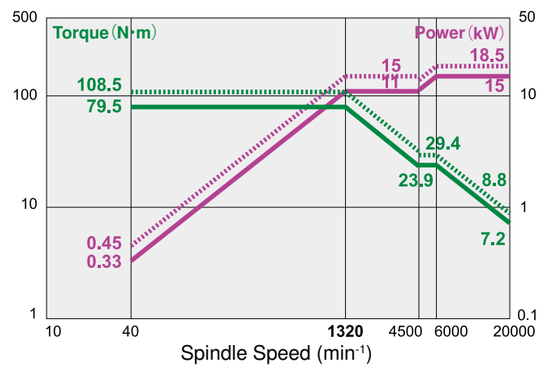
12,000min^{-1} (7.5 /11 kW(Continuous / 30 min)) Standard



15,000min^{-1} (Low : 7.5 / 11 kW、High : 11 / 15 kW) Option

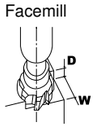
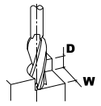


20,000min^{-1} (Low : 11 / 15 kW、High : 15 / 18.5 kW) Option



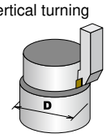
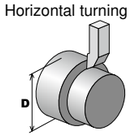
Capabilities in Milling, Turning or Grinding Mode Comparable to Single-purpose Machines

■ Test results (milling mode)

	Part material	Tool size	Cutting width Cutting depth	Spindle speed	Cutting feed rate	Cutting capacity
Facemill 	A5052	ϕ80mm	W=70mm D=4mm	5,500min^{-1}	4,500mm/min	1,260cc/min
	S45C	ϕ80mm	W=70mm D=3mm	900min^{-1}	1,800mm/min	378cc/min
Endmill 	A5052	ϕ25mm	W=22mm D=6mm	12,000min^{-1}	7,000mm/min	924cc/min
	S45C	ϕ25mm	W=3mm D=30mm	5,000min^{-1}	3,500mm/min	315cc/min

* Tested with standard spindle (12,000 min^{-1}) * Actual measured data; these are not guaranteed values.

■ Test results (turning mode)

	Part material	Outer dia.	Cutting depth (dia.)	Rotation speed	Feed rate (per rotation)	Cutting capacity
Vertical turning 	A5057	ϕ243mm	6mm	800min^{-1}	0.4mm	732cc/min
		ϕ113mm	5mm	3,000min^{-1}	0.5mm	1,330cc/min
Horizontal turning 	S45C	ϕ348mm	3mm	180min^{-1}	0.18mm	53.1cc/min
		ϕ118mm	6mm	800min^{-1}	0.3mm	267cc/min

* No difference between the turning methods (vertical or horizontal) * Actual measured data; these are not guaranteed values.

■ Test results (grinding mode)

Part material	Cylindrical grinding			Surface grinding	
	Out of roundness	Cylindricity	Surface roughness	Flatness	Surface roughness
SCM420 (heat-treated HRc60)	0.3μm	0.7μm	0.13μm	0.5μm	0.09μm
SCM435 (hardened HRc23)	0.3μm	0.4μm	0.1μm	1.07μm	0.14μm

Part size: D120 x 110mm Grinding wheel size: D75 x 35mm * Actual measured data; these are not guaranteed values.

Automation of High-accuracy Workpiece Measurement, Wheel Dressing and Grinding

All processes from workpiece diameter measurement, wheel radius measurement, wheel dressing and grinding, to workpiece diameter measurement after grinding can be automated.

Grinding function

Option

Grinding is performed by rotating the grinding wheel mounted on the spindle and the workpiece on the C axis at the same time.

Packaged options

Option

Options required for grinding, such as linear guides and spindle outer nozzles, are packaged.Choose either basic type A or type B with high-pressure coolant through spindle.

Grinding function	Y-axis linear guide dustproof cover	Spindle outer nozzle	Chopping (G81.1)	FP-70 (High-pressure coolant through spindle 7 MPa + oil cooler + 5μm filter)	Grinding screen, cutting macro program, automatic measurement (optical) MP-700, tool breakage (laser), dresser, wheel cleaning air blow (either automatic measurement (optical) MP700 or tool breakage (laser) unit must be selected)
Type A	○	○	○	–	–
Type B	○	○	○	○	–
Type A + automation	○	○	○	–	○
Type B + automation	○	○	○	○	○

Dresser

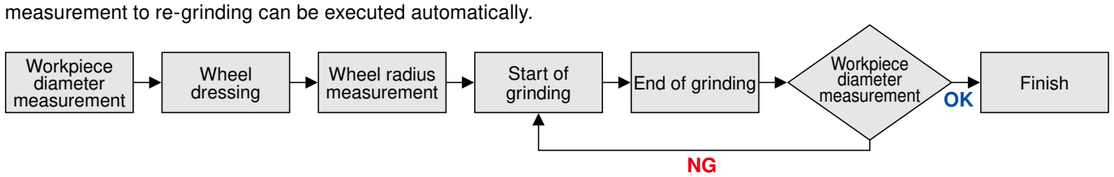
Tool breakage (laser)

Automatic measurement (MP-700)

Grinding automation function

Option

A diamond dresser and MP-700 touch probe for high-speed high-accuracy automatic workpiece position / size measurement are provided. The entire processes starting from workpiece measurement, wheel dressing, grinding and workpiece post-measurement to re-grinding can be executed automatically.



Options – From Prototype & One off Pieces to Vast Production Runs

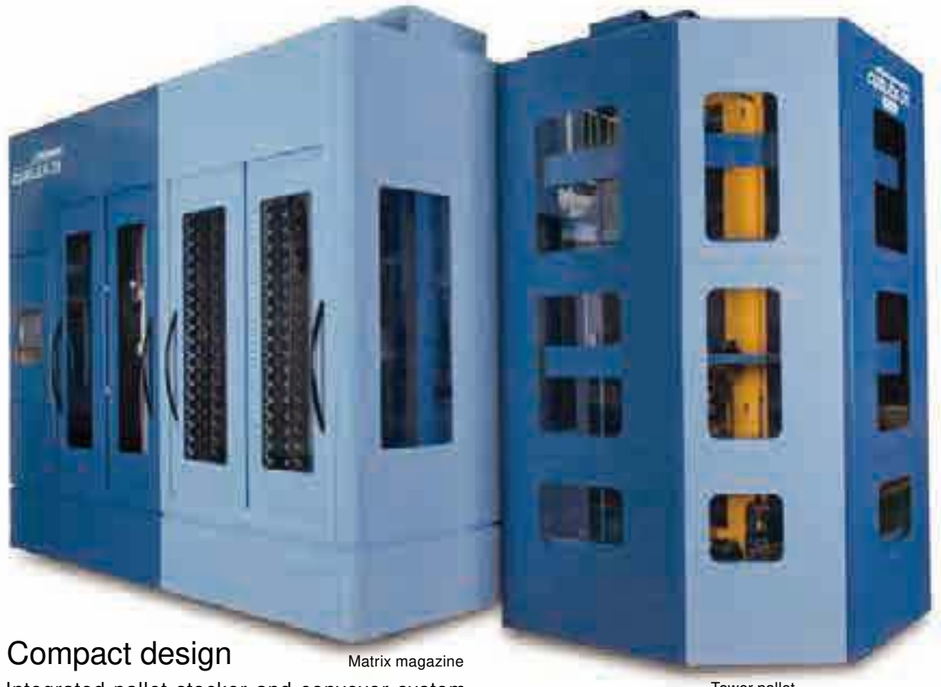
Pallet changer "PC2" and 60-tool chain magazine are standard machine features. Optional APC or ATC systems maximize the possibilities of long-span unmanned operation.

Optional Matrix magazine – upto 520 tools

The standard chain magazine holds 60 tools. An optional matrix magazine can be selected with a tool holding capacity from 120 tools up to a maximum of 520 tools in increments of 40 tools.

60-tool chain magazine

Maximum tool diameter	mm	80 (with adjacent tools) 150 (without adjacent tools)
Maximum tool length	mm	350
Maximum tool length	kg	10



Matrix magazine

Compact design

Integrated pallet stocker and conveyor system designed to minimize the required floor space

Tower pallet system expandable up to PC40

Whatever your present or future production requirements, there is a configuration of ***CUBLEX-35*** that will help your business grow & adapt to new projects & customers.

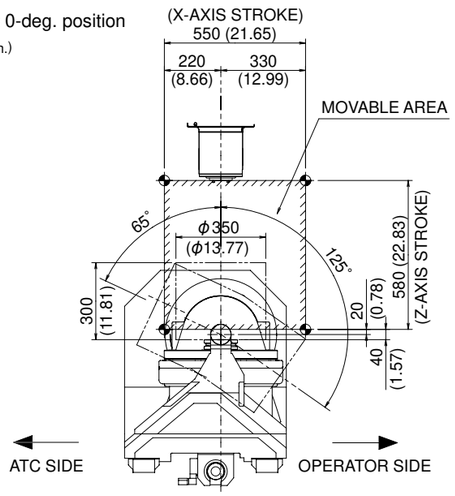
* Contact your Matsuura agent for a bespoke assessment of your production.
* With PC32 and PC40, workpieces up to 315 mm high can be stored in the top level of the tower pallet.

Pallet	PC32				PC40			
	Rack 1	Rack 2	Rack 3	Rack 4	Rack 1	Rack 2	Rack 3	Rack 4
	15	10	7		15	15	7	3
Part size	D350 H300 mm				D350 H300 mm	D300 H300 mm	D350 H300 mm	
	60kg				60kg			
								

Stroke diagram

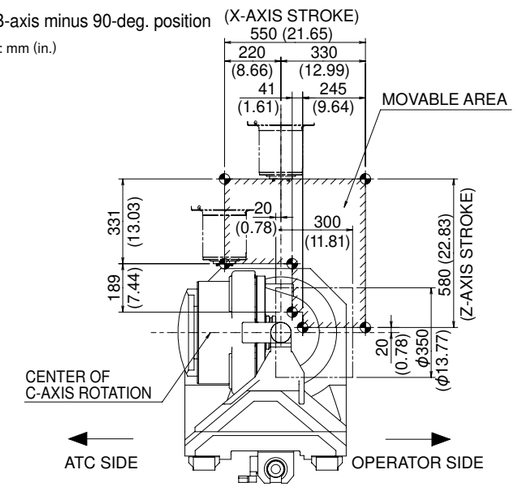
■ B-axis 0-deg. position

Unit : mm (in.)



■ B-axis minus 90-deg. position

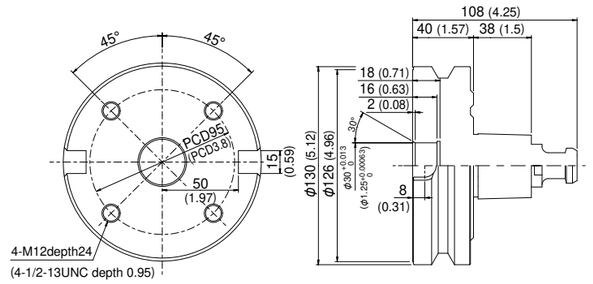
Unit : mm (in.)



Compact & high precision Versatile CAPTO system employed

The CAPTO system with high-precision positioning and repeatability is employed for the pallet system. Commercially available fixtures are well supported.

■ Pallet top view Unit : mm (in.)



Chip disposal system for extended unmanned operation

Chip flush coolant and a spiral chip conveyor are provided as standard features. A lift-up conveyor is available as an option.

Tailstock

Option

A tailstock is available for long workpieces. This can be used at a C-axis speed of 3,000 min^{-1}.

Ergonomic Design for Maximum Ease of Operation

Accessibility to workpiece and spindle

Excellent access – 450mm from the operator position to the pallet centre & 280mmm to the spindle centre. Door opening width is a colossal 630mm – further improving access & operator comfort.

Easy-to-read, easy-to-recognize large screen touch panel

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 screen. Screen display can be switched by single-tapping, and can be customized as needed.

GibbsCAM

GibbsCAM is a field-oriented solid CAM system which is easy to use and learn. A ***CUBLEX***-series dedicated module and post processor are available. Rendering simulation in part mode ensures collision free programming.

GibbsCAM® Powerfully Simple. Simply Powerful.®

5-axis error probing and correction eZ-5 Option

eZ-5 utilizes a touch probe and correction ball to measure errors and correct the center coordinates of the tilting/ rotating axes. Geometrical errors in 5-axis machining can be tuned easily in the field.

MIMS *Matsuura Intelligent Meister System*

Collection of technical expertise and special skills

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

Thermal Meister

- 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 functions
- Machine restoration support functions

Reliability Meister Plus Option

Increased security provided

- Electronic manual
- E-mailing function

Intelligent Protection System Standard

Ultra Safe Collision Protection

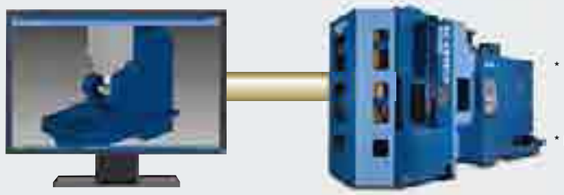
The Intelligent Protection System is Matsuura's original collision prevention system, which reliably prevents collisions during automatic or manual operation or setup that may occur due to programming errors or mistakes.

Intelligent Protection System ON

Manual/automatic operation
Simultaneous 5-axis machining

* This shows a concept image.

On-line link with PC



PC * This shows a concept image. Machining center

* ***Intelligent Protection System*** System simulates your programmed components (tools, workpiece, fixtures, etc.) that match 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.

Standard Machine Specifications

■ Movement and Range		
X-axis travel	mm (in.)	550 (21.65)
Y-axis travel	mm (in.)	440 (17.32)
Z-axis travel	mm (in.)	580 (22.83)
B-axis rotation angle	deg	+65 ～ -125
C-axis rotation angle	deg	360
■ Pallet		
Working surface	mm (in.)	φ130 (φ5.11)
Loading capacity	kg (lb.)	60 (132)
Max. workpiece size	mm (in.)	φ350 × H 315 (φ13.77 × H 12.40)
■ Spindle		
Spindle speed	min^{-1}	40 - 12000 (grease lubrication)
Spindle speed change command		S5 digits direct command
Type of spindle taper		HSK-A63W (ICTM)
Spindle bearing inner diameter	mm (in.)	φ80 (φ3.14)
Spindle motor output	kW	AC 7.5 / 11 (cont. / 30 min.)
Max. spindle torque	N·m	167 / 630min^{-1}
■ Feed Rate		
Rapid traverse rate X / Y / Z	mm/min	60000 / 60000 / 60000
B	min^{-1}	50
C	min^{-1}	200 / 3000 (Milling mode/turning mode)
■ Automatic Tool Changer		
Type of tool shank		HSK-A63W (ICTM)
Tool storage capacity	pcs.	60 (chain type)
Max. tool diameter	mm (in.)	80 (φ3.14) (with adjacent tools) 150 (φ5.90) (without adjacent tools) Storage locations are restricted.
Max. tool length	mm (in.)	350 (13.77)
Max. tool mass	kg (lb.)	10 (22)
Tool change time	sec	1.1 (Tool-to-tool) 7.9 (Chip-to-chip)

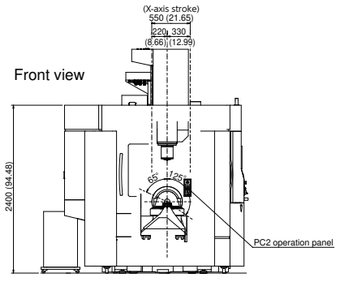
■ Automatic Pallet Changer		
Number of pallets		2
■ Power Sources		
Electrical power supply	KVA	80 (Depends on the optional features)
Power supply voltage	V	AC 200 / 220±10% Transformer required for the voltage except above
Power supply frequency	Hz	50 / 60±1
Air volume to be supplied (maximum flow volume)	NL	600min^{-1}
■ Tank Capacity		
Hydraulic oil tank	L	40
Coolant tank	L	400
Oil cooler tank	L	10 (total capacity: 15 L)
■ NC System		
Control system		***Matsuura G-Tech 31i***

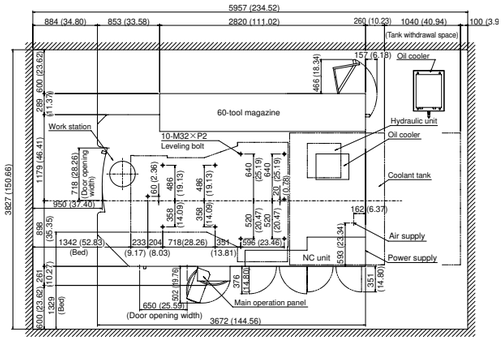
■ Standard Accessories

01.Total splash guard	02. ATC auto door
03. Synchronized tapping function	04. ***AD-TAP*** function
05. ***IPC*** function	06. Imbalance check function
07. Oil cooler	08. Auto grease supply unit for feed axes
09. Hydraulic oil cooler	10. Coolant unit
11. Chip-flush coolant	12. Spiral chip conveyor
13. Spindle overload protection	14. M-code counter (9 kinds)
15. Work light	16. Standard mechanical tools & tool box
17. Machine color paint	18. Scale feedback B-/C-axis
19. C-axis spindle cleaner	20. ***Intelligent Protection System***
21. Leveling pads & bolts	
22. ***MIMS*** (Matsuura Intelligent Meister System)	

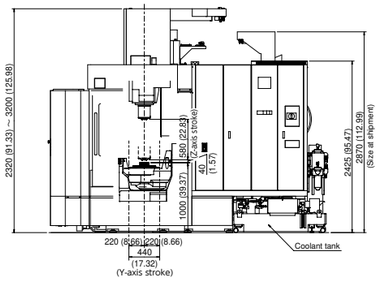
* 2 years spindle warranty

PC2 External View, Floor Plan Unit : mm (in.)





Right side view



Optional Equipment

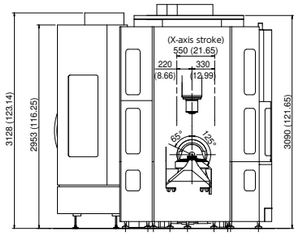
○: Standard ▲: Option

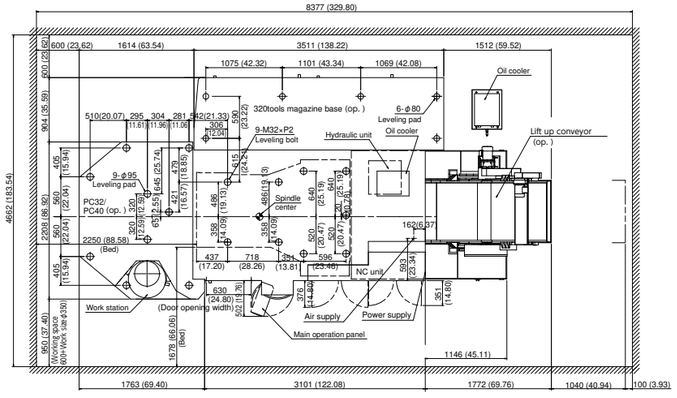
■ Attachment List	
12,000min^{-1} (HSK-A63W, grease lubrication)	○
15,000min^{-1} (HSK-A63W, auto grease lubrication)	
Spindle motor output kW Low : 7.5 / 12、High : 7.5 / 15	▲
Max. spindle torque N·m 135	
20,000min^{-1} (HSK-A63W, auto grease lubrication)	
Spindle motor output kW Low : 11 / 15、High : 15 / 18.5	▲
Max. spindle torque N·m 108.4	
■ ATC	
60 tools (chain magazine)	○
120 / 160 / 200 / 240 / 280 / 320 tools (matrix magazine 320-tool base)	▲
360 / 400 / 440 / 480 / 520 tools (matrix magazine 520-tool base)	▲
■ High Accuracy Control	
Scale feedback X-/Y-/Z-axis (Heidenhain)	▲
■ APC	
PC2	○
PC32 (Tower pallet system)	▲
PC40 (Tower pallet system)	▲
■ Coolant	
Coolant tank unit	○
Vacuum type coolant through spindle A 70BAR	▲
Vacuum type coolant through spindle A 140BAR	▲
Vacuum type coolant through spindle B 70BAR	▲
Vacuum type coolant through spindle B 140BAR	▲
Vacuum type coolant through spindle C 20BAR	▲
Vacuum type coolant through spindle C 70BAR	▲
Coolant flow checker	▲
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)	▲
Tool breakage / full automatic tool length measurement (hybrid)	▲
Automatic measurement (optical) & tool breakage (contact)	▲
Automatic measurement (optical) & tool breakage (laser)	▲
Automatic measurement (optical) & tool breakage (hybrid)	▲
Automatic measurement (MP-700) & tool breakage (laser)	▲
External tool breakage (60-tool chain magazine, contact)	▲
External tool breakage (matrix magazine, contact)	▲
■ Safety Devices	
Matsuura safety specification	○
Automatic fire extinguisher	▲
■ Reliability Meister Plus	
Reliability Meister Plus TYPE A	▲
Reliability Meister Plus TYPE B	▲

■ Chip Removal	
Total splash guard	○
ATC auto door	○
Spiral chip conveyor	○
Lift-up conveyor (hinge + scraper, drum)	▲
Air blow for chip removal	▲
Chip bucket	▲
Part washing gun (on the machine side)	▲
Part washing gun (on the APC side)	▲
20-bar external nozzle (with coolant through spindle)	▲
70-bar external nozzle (with coolant through spindle)	▲
■ Operation/Maintenance Support	
AD-TAP function	○
IPC function	○
Work light	○
MIMS	○
Intelligent Protection System	○
Auto grease supply unit for feed axes	○
Additional eight M functions	▲
Spindle load monitoring function	▲
Weekly timer	▲
3-color signal light (red, yellow, green from top)	▲
Removable manual pulse generator	▲
Optional block skip addition 2 to 9	▲
Pre-machining tool check function	▲
Rotary wiper (air driven)	▲
Rotary wiper (electrically driven)	▲
Semi-dry unit	▲
100 VAC socket	▲
eZ-5 (with calibration ball)	▲
eZ-5 (without calibration ball)	▲
Pressure supply system for fixtures	▲
■ Machining Support	
Tailstock	▲
Tool ID system (Balluff, format A)	▲
Tool ID system (Balluff, format B)	▲
Tool ID system (Balluff, format C)	▲
Tool ID system	▲
■ Optional Package	
High-speed high-accuracy package	▲
5th-axis package	▲
High-speed high-accuracy & 5th-axis package	▲
Value package	▲
TRUE PATH	▲
Machine module	▲
Grinding function A	▲
Grinding function B (+ 70-bar coolant system)	▲
Grinding function A + automation	▲
Grinding function B (+ 70-bar coolant system) + automation	▲

PC32 External View, Floor Plan Unit : mm (in.)

Front view





Right side view