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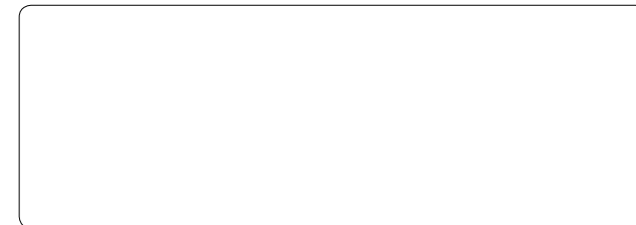
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- The photos may show optional accessories.



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

 **Matsuura**

5-Axis Multi-Tasking Machining Center

# CUBLEX-35



**MAXIA**  
Innovation by  Matsuura

Advanced, high precision multi-tasking for sustained unmanned production

## 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 accumulated errors between different operations are eliminated. Higher accuracy, more production, reduced manpower costs & faster times to market are all realised.



Max. Workpiece Size :  $\phi 350 \times H315$  mm  
 Loading Capacity : 60 kg  
 X/Y/Z-Axis Travel : 550 / 440 / 580 mm  
 B/C-Axis Rotation Angle : +65 ~ -125 / 360 deg



### Milling + turning + grinding\* Option incorporated in one machine

In addition to 5-axis milling capabilities, turning and grinding\* functions are incorporated in one machine.

### Extended unmanned running with single chucking operation

one chucking turning & grinding added to the unrivalled 5 axis. profitable & sustained unmanned performance is assured.

### Irregular-shaped, rectangular and thin workpieces supported

Irregular component shapes and those possessing thin walled characteristics are easily accommodated as are difficult to chuck rectangular shaped components.

### New ATC Matrix Magazine Option

2 types of high capacity storage systems, configured to your demands. (330 magazine base or 530 magazine base)

### Expandable Pallet Magazine Option

APC available are: PC2, PC32, PC40, PC49, PC60 with single workstation PC38 and PC47 with twin workstation.

### Improved Operation with iHMI

Larger screen and icons for easier viewing and reduced errors.

#### Productivity

Milling + turning + grinding\* incorporated in one machine

#### Operability

Extended unmanned running with single chucking operation

#### Accuracy

Irregular-shaped, rectangular and thin workpieces supported

#### Productivity

New matrix type tool magazine

#### Extensibility

Pallet magazine options have been extended

#### Usability

Improved operation with iHMI

*Up grade*

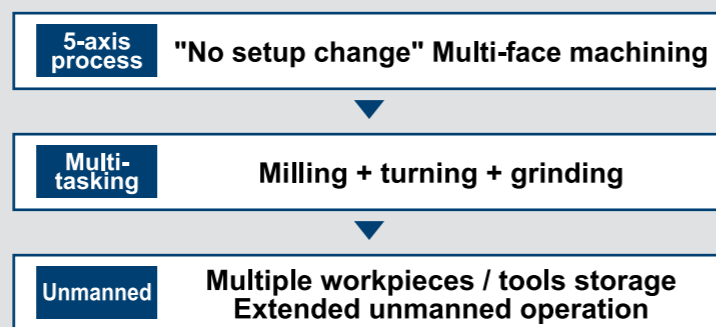
# CUBLEX-35

5-Axis Multi-Tasking Machining Center

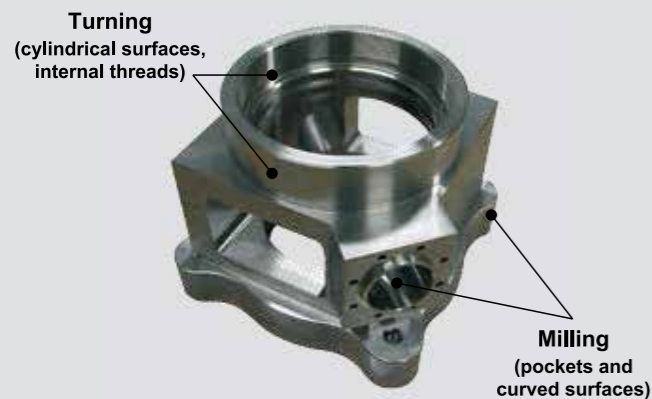
## Milling + Turning + Grinding Option Incorporated in One Machine

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

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



### Chamber



Conventional (lathe + 5-axis MC)

**2 + 2 = 4 Process**

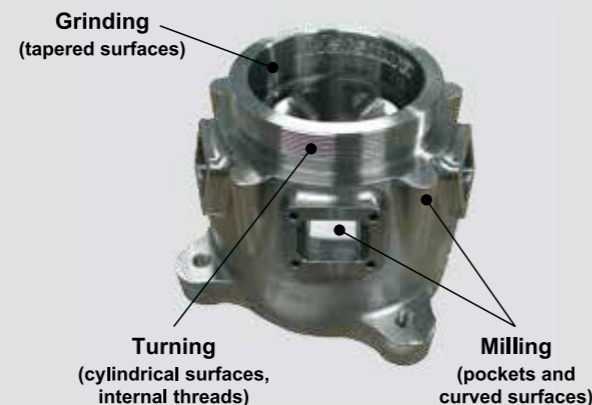
**CUBLEX-35**

**2 Process (50% reduction)**

**Tools used** 6 tools (turning) + 11 tools (milling)

**Material** CENA 1 (HRC40)

### Crank case



Conventional (lathe + 5-axis MC)

**2 + 2 = 4 Process**

**CUBLEX-35**

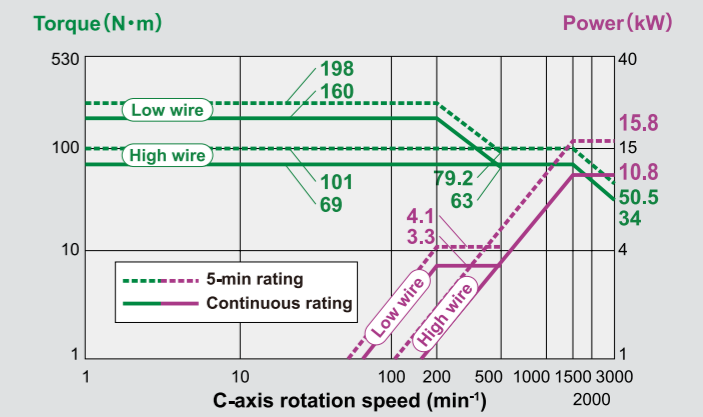
**2 Process (50% reduction)**

**Tools used** 6 tools (turning) + 12 tools (milling) + 1 tool (grinding)

**Material** CENA 1 (HRC40)

### Turning spindle

High speed, high accuracy C-Axis positioning in Milling mode (maximum spindle speed is 200 min<sup>-1</sup>) and high speed chuck rotation in turning mode (3,000 min<sup>-1</sup>) – 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.



Vertical turning



Horizontal turning



Internal grinding



End face grinding

### 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.



# CUBLEX-35

5-Axis Multi-Tasking Machining Center

# Tooling System for Multi-Tasking Machines

## HSK ICTM standard

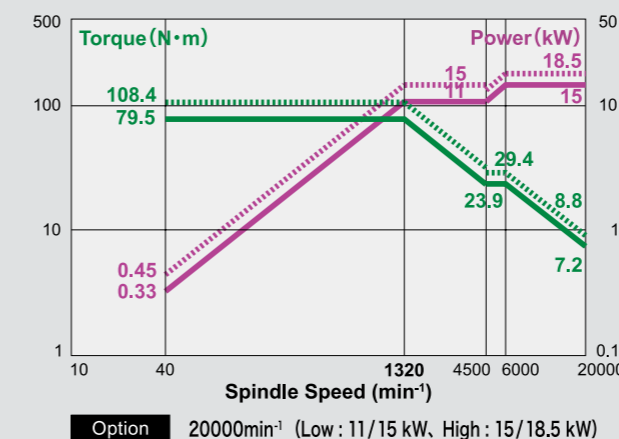
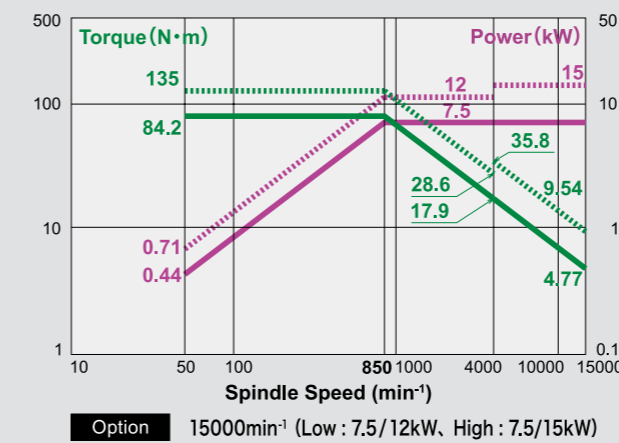
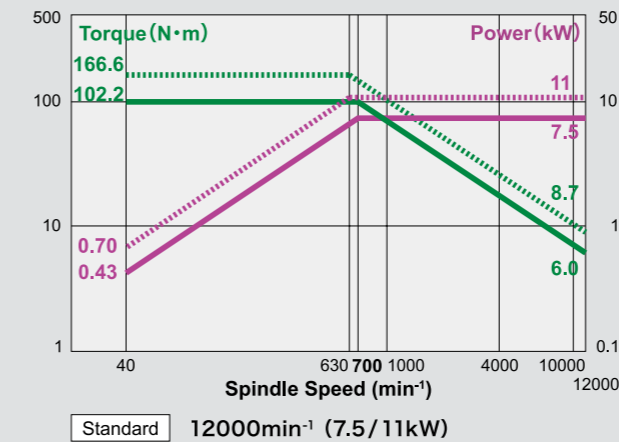
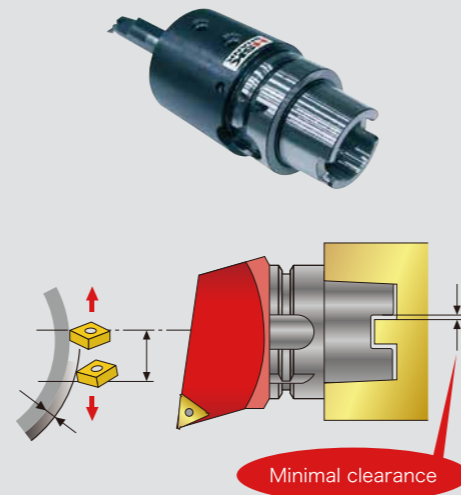
ICTM is based on the HSK standard for multi-tasking machining centres. ICTM / HSK is included & recognised in both JIS & ISO Standards.

### Maintains high accuracy during turning

Reduced clearance between the spindle drive key & the tool holder keyway ensures sustained turning accuracy.

### Strong against flexural rigidity

Two face clamping assures high rigidity against the cutting force generated during turning.



## 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

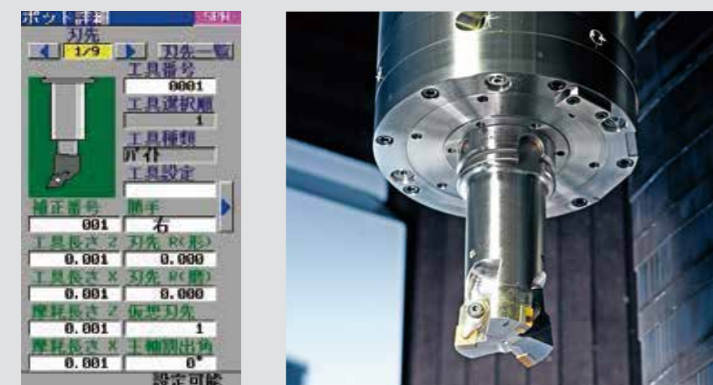
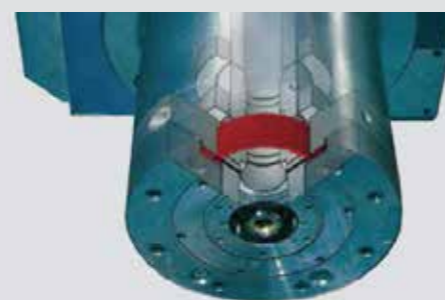
Grease spindle lubrication system is employed for environmental protection and labor saving.

## 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.

## 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

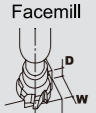
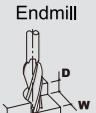
The Matsuura Spindle possesses an integrated and robust drum brake mechanism. This proven spindle lock system contributes greatly to sustainable high accuracy turning.

# CUBLEX-35

5-Axis Multi-Tasking Machining Center

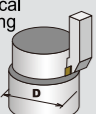
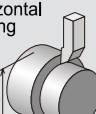
## Capabilities in Milling, Turning or Grinding Mode Comparable to Single-purpose Machines

### Test results (milling mode)

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

\* Tested with standard spindle (12,000 min<sup>-1</sup>)  
\* Actual measured data; these are not guaranteed values.

### Test results (turning mode)

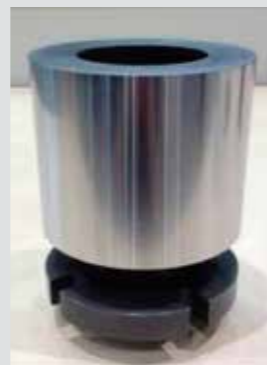
	Part material	Outer dia.	Cutting depth (dia.)	Rotation speed	Feed rate (per rotation)	Cutting capacity
 Vertical turning	A5057	φ243mm	6mm	800min <sup>-1</sup>	0.4mm	732cc/min
	A5057	φ113mm	5mm	3,000min <sup>-1</sup>	0.5mm	1,330cc/min
 Horizontal turning	S45C	φ348mm	3mm	180min <sup>-1</sup>	0.18mm	53.1cc/min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

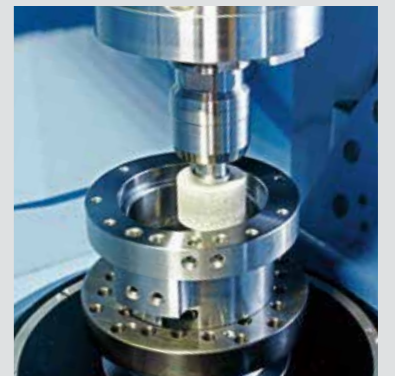
Part size: D120 x 110mm Grinding wheel size: D75 x 35mm \* Actual measured data; these are not guaranteed values.



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

### Grinding function

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

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.

	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, dresser, wheel cleaning air blow ※Includes automatic measurement (optical) OMP600 (matsuura macro) and tool breakage (hybrid system)
Type A	○	○	○	—	—
Type B	○	○	○	○	—
Type A + automation	○	○	○	—	○
Type B + automation	○	○	○	○	○



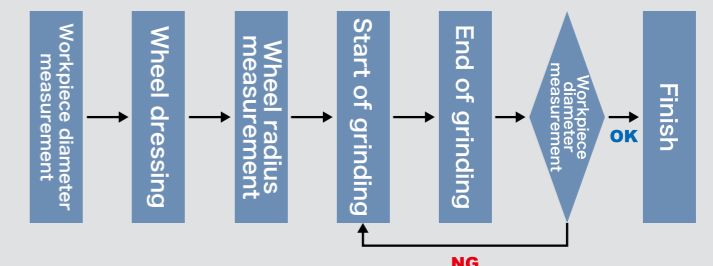
Dresser



Tool breakage

### Grinding automation function

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 postmeasurement to re-grinding can be executed automatically.



# CUBLEX-35

5-Axis Multi-Tasking Machining Center

## Capable of extended periods of unmanned operation with multiple products and varied production volumes



### Choose the tool magazine that suits your needs.

#### 60 tool chain magazine

Standard

- ▶ Chain driven 60 tool magazine.



#### Matrix tool magazine

Option

- ▶ 330 tool magazine/530 tool magazine. **NEW**
- ▶ With a servo drive providing higher speed, the newly developed matrix magazines have a small footprint while offering high tool storage capacity (330 tools/530 tools).



### Tool magazine operation panel

The screen switches according to the category, such as setup, maintenance and alarms. Setting, search and confirmation for each type of item can be performed on the screen.

- ▶ Tool/pot search.
- ▶ All tool screen display.
- ▶ Setting, editing and confirmation of data for tools in the magazine.
- ▶ Tool life warning screen.
- ▶ Tool reset/centering screen.



### 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.



Drive type	Horizontal/vertical axis
	Conveyor arm
Tool loading time	Shortest
	Longest
Large diameter tool	
Independent tool preparation pot	

#### 330 tool base magazine

Servo (rack and pinion/ball screw)

Servo

8.7 seconds 50% less than previously

13.4 seconds 39% less than previously

25 tools An increase of 9

The maximum tool storage capacity decreases by 40 when 25 large diameter tools are accommodated.

Option

#### Tool setup door.



#### Swiveling operation panel



POT	T	H	LENG(G)	RADIUS(G)	STATUS
001	0008	008	108.000	0.056	USED
002	0002	002	102.345	3.400	USED
003	0003	003	113.000	0.000	USED
004	0004	004	0.000	0.000	
005	0025	025	0.000	0.000	
006	0006	006	106.000	0.056	USED
007	0007	007	107.000	0.056	USED
009	0009	009	109.000	-0.005	USED
010	0010	010	110.123	-0.056	USED
011	0011	011	111.000	0.000	USED
012	0012	012	112.000	0.000	USED
013	0013	013	113.000	0.000	USED
014	0014	014	114.000	0.000	USED
015	0015	015	115.000	0.000	USED
016	0016	016	116.000	0.000	USED
017	0017	017	117.000	0.000	USED
018	0018	018	118.000	0.000	USED
019	0019	019	0.000	0.000	
020	0020	020	0.000	0.000	

### Tool life management

- ▶ 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.

### Tool pre-check

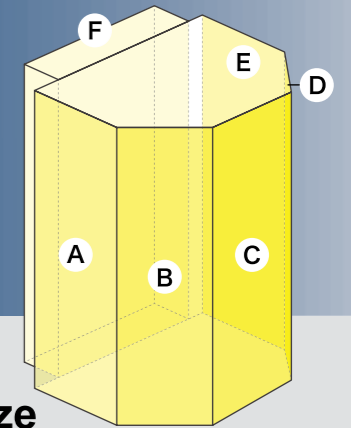
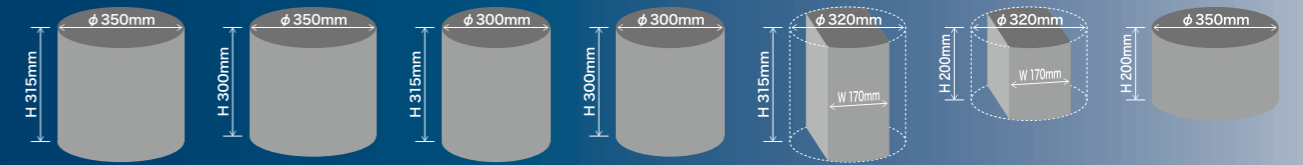
Option

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

# CUBLEX-35

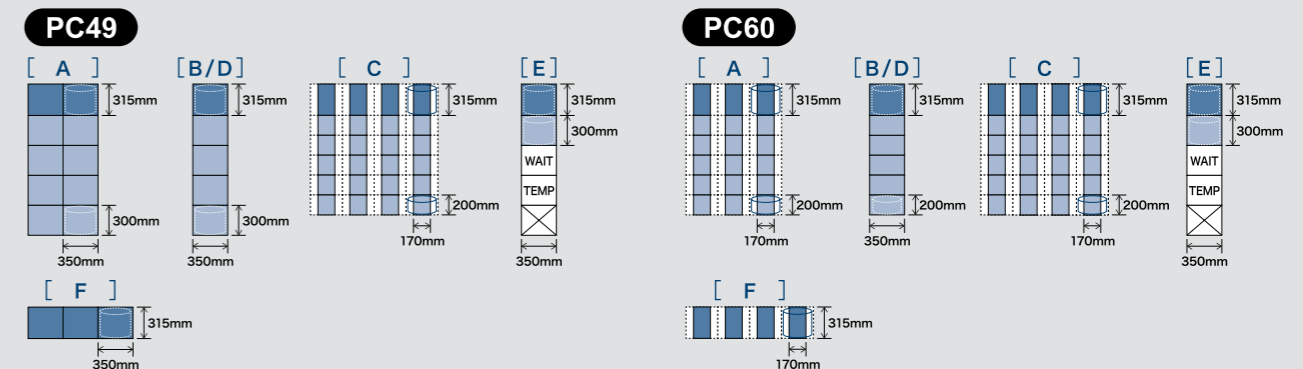
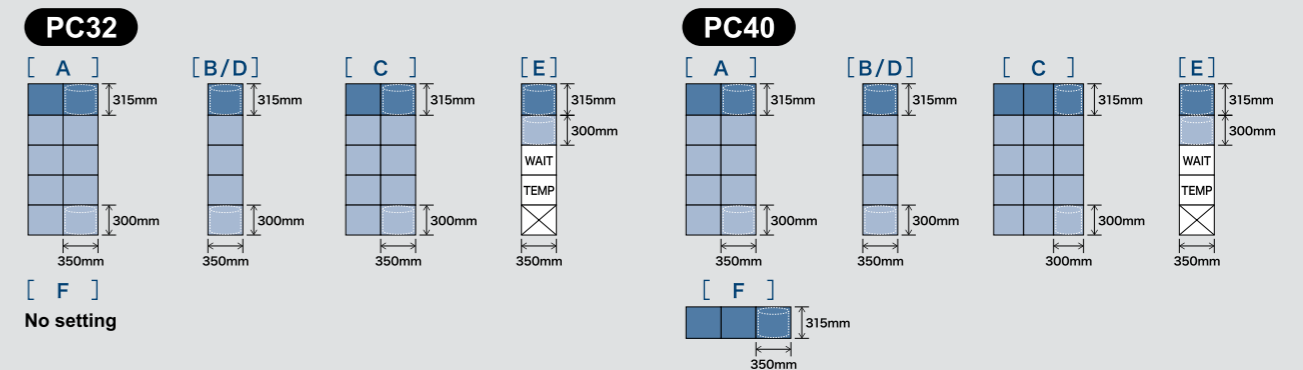
5-Axis Multi-Tasking Machining Center

## Multipallet system offers flexibility for multiple product and volume unmanned production.



The number of pallets stored can be increased without changing the machine body and floor size, through optimization of the workpiece size and stocker configuration.

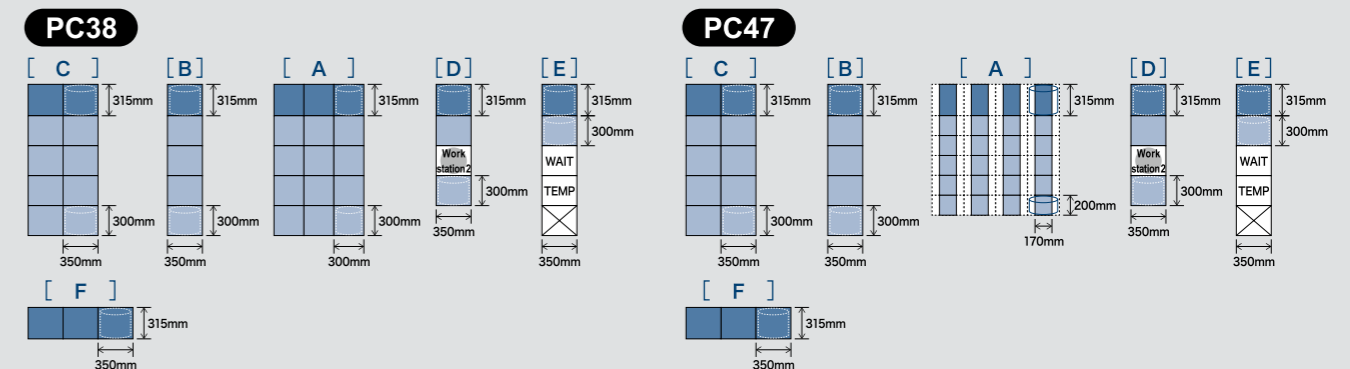
### Pallet stocker configuration and workpiece size



### 2 Workstations

Setup can be performed by 2 operators simultaneously, shortening the pallet loading time.

- ▶ Workstation 1: Work setup.
- ▶ Workstation 2: Call a different pallet.



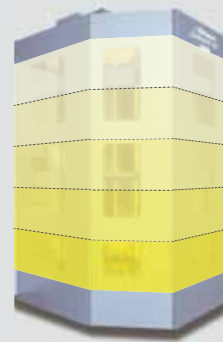
PC2 Standard



PC32/40

NEW

PC49/60



NEW

PC38/47

Option

\* Limits exist for workpiece size and storage position.

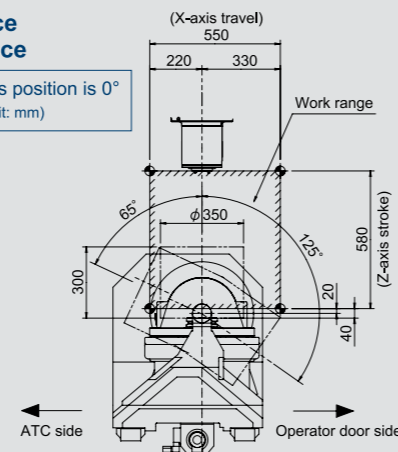
### Compact with high precision

The pallet clamping system is Capto C6 offering high positional accuracy and rigidity.

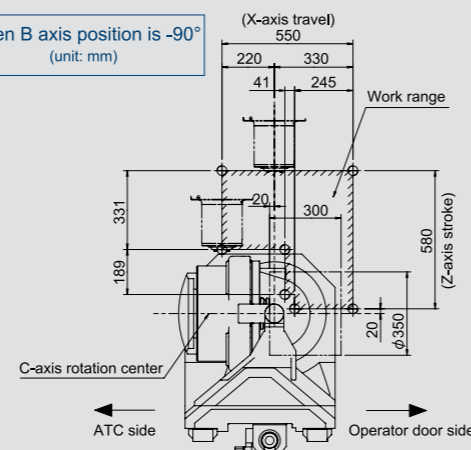


#### Work piece interference

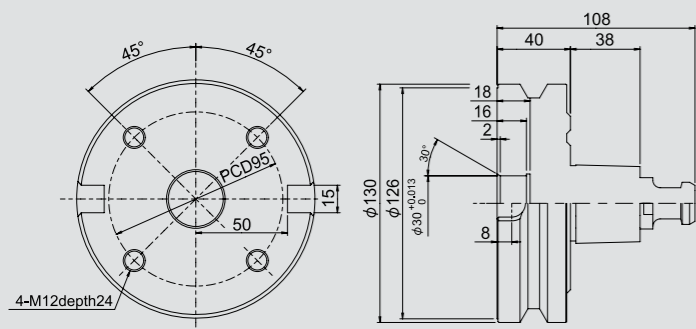
When B axis position is 0° (unit: mm)



When B axis position is -90° (unit: mm)



[ Pallet top view(unit: mm) ]

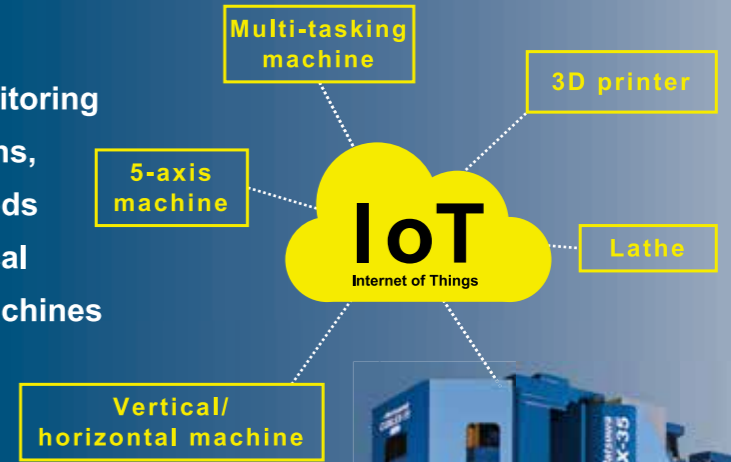


# CUBLEX-35

5-Axis Multi-Tasking Machining Center

## Extended Unmanned Operation Support Functions

Comes equipped with work monitoring and operational support functions, providing security for long periods of unmanned running. Mechanical support functions to confirm machines operation and condition.



### Easy pallet management and scheduling

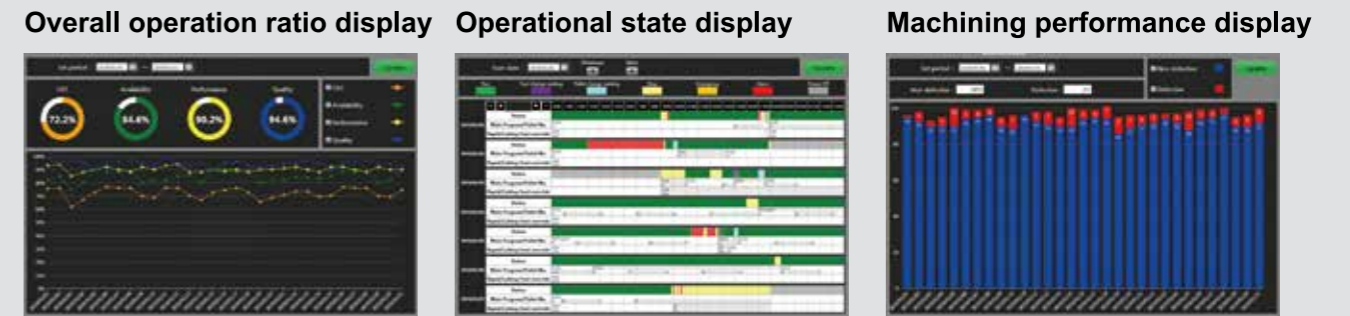
Continuous operation is made possible by setting all necessary information into the schedule table. Order or priority of machining can be easily changed to meet production requirements. Pallet reserve, interrupt, priority and repeat can be set for each pallet. Pallet management screen is designed for easy operation and flexible production.

<b>Scheduled operation</b>	Machining pallets according to the set schedule number.
<b>Interrupt pallet</b>	Prioritizes highlighted pallet number in production schedule.
<b>Reserve pallet</b>	Reserves pallets for when unmanned run time is allowed.
<b>Continuous operation</b>	Continually machines specified pallets only.
<b>End Pallet setting</b>	Stops machining after a certain pallet number has been completed.

### Operation monitoring functions —Matsura IoT

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

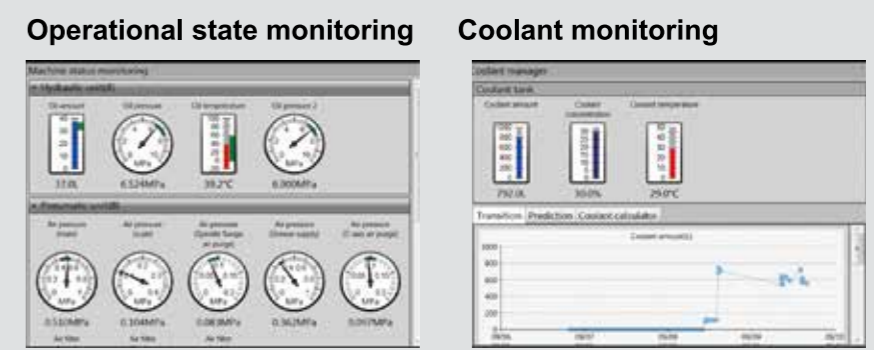
- ▶ Performance is monitored to check OEE. \* Overall equipment efficiency.
- ▶ Data can be output to process data acquisition (PDA) systems. \* Overall equipment efficiency (OEE) = availability x performance x quality



### Operation support function —Matsura IoT

Enhanced automated systems to reduce operator reliance and human errors.

- ▶ Monitors all supply systems relating to machine performance.
- ▶ Operators are notified if the machine requires attention.
- ▶ Current situation and history records can be analysed via a screen.





# CUBLEX-35

5-Axis Multi-Tasking Machining Center

## Easy Operation



### Maximum functionality and optimised performance

## MIMS

Matsura 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
    - Environmental thermal displacement compensation
    - XYZ thermal displacement compensation
- Environment**
  - Eco Meister**
  - Eco mode**
  - Power savings**
    - Power cut-off function
    - Energy-saving devices installed
    - Eco-operation



### Operation Panel

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

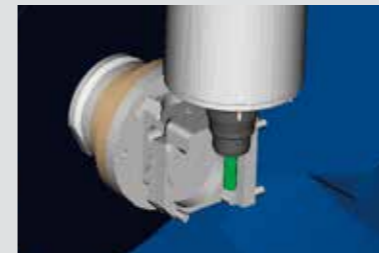


Program management

Tool offset

Electronic manual display

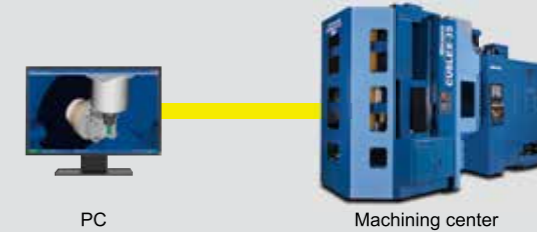
## Intelligent Protection System



### Collision prevention function Standard

This collision protection function is developed solely by Matsura. It prevents machine collisions due to programming or setup errors in automatic operation as well as human errors in manual operations.

#### On-line link with PC



\* The *Intelligent Protection System* simulates your programmed components (tools, workpiece, fixtures, etc.) that match the machine model, alerting you to any possible interference or collision before it actually happens.  
\* Prepare a PC on your side. Contact Matsura for PC requirements.

## eZ-5

### 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 a calibration sphere only within 3 minutes. The high accuracy of the machine is maintained through quick and simple automatic operations.

\* eZ-5 requires a separately available NC option for additional macro variables.



Option

image

### Automatic measurement (interactive)

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



Blum



Renishaw

Option

# CUBLEX-35

## [ Specification / Equipment ]

### 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.) ]	φ 130 (5.11)
Loading capacity	[ kg(lb.) ]	60 (132)
Max. workpiece size	[ mm(in.) ]	φ 350 × H315 (φ 13.77 × H12.40)
Spindle		
Spindle speed	[ min <sup>-1</sup> ]	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.) ]	φ 80 (φ 3.14)
Spindle motor output	[ kW ]	AC 7.5 / 11 (cont. / 30 min.)
Max. spindle torque	[ N·m ]	167 / 630min <sup>-1</sup>
Feed Rate		
Rapid traverse rate X / Y / Z	[ mm/min ]	60000 / 60000 / 60000
B	[ min <sup>-1</sup> ]	50
C	[ min <sup>-1</sup> ]	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) 5.8 (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/min ]	594
Machine Size		
Machine Weight	[ kg(lb.) ]	12300 (PC2/60ATC)
Machine Weight	[ kg(lb.) ]	15900 (PC32/330ATC)
Tank Capacity		
Hydraulic oil tank	[ L ]	40
Coolant tank	[ L ]	400
Control system	[ L ]	10 (total capacity: 15 L)
NC System		
Control system		Matsura G-Tech 31i
Standard Accessories		
01. AD-TAP Function		02. IPC Function
03. Imbalance check function		04. Oil cooler (Spindle, 4/5AX)
05. Auto grease supply unit for feed axes		06. Hydraulic oil cooler
07. Spiral chip conveyor		08. 9 sorts of M-code Counters
09. Standard mechanical tools & tool box		10. Machine color paint
11. Scale feedback B/C-axis		12. C-axis spindle cleaner
13. Intelligent Protection System		14. Leveling pads & bolts
15. MIMS (Matsura Intelligent Meister System)		
16. Spindle thermal displacement compensation		17. Spindle runhour meter
18. Automatic operation runhour meter		19. Spindle two-year warranty

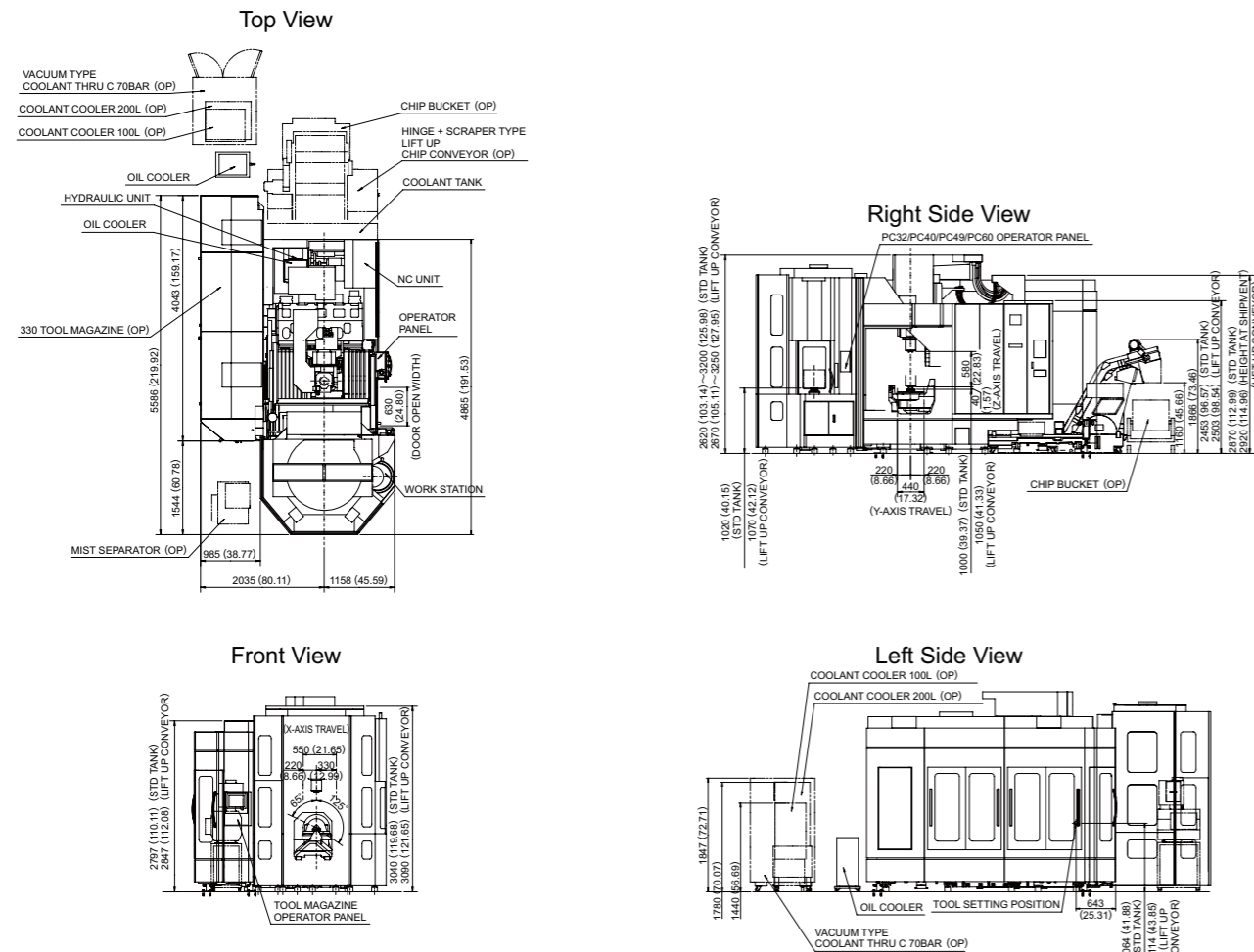
### Optional Equipment

Spindle		
12,000min <sup>-1</sup> (HSK-A63W, grease lubrication)		○
15,000min <sup>-1</sup> (HSK-A63W, auto grease lubrication)		○
Spindle motor output [ kW ]	Low : 7.5 / 12, High : 7.5 / 15	▲
Max. spindle torque [ N·m ]	135	▲
ATC		
20,000min <sup>-1</sup> (HSK-A63W, auto grease lubrication)		○
Spindle motor output [ kW ]	Low : 11 / 15, High : 15 / 18.5	▲
Max. spindle torque [ N·m ]	108.4	▲
High Accuracy Control		
Scale feedback X-/Y-/Z-axis (Heidenhain)		▲
APC		
PC2		○
PC32 (Tower pallet system)	1 Work Station	▲
PC40 (Tower pallet system)	1 Work Station	▲
PC49 (Tower pallet system)	1 Work Station	▲
PC60 (Tower pallet system)	1 Work Station	▲
PC38 (Tower pallet system)	Twin Work Stations	▲
PC47 (Tower pallet system)	Twin Work Stations	▲
Coolant		
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		
I.p.measure/auto.centring (optic,blum,matsuura macro)		▲
I.p.measure/auto.centring (optic, blum, blum macro)		▲
I.p.measure/auto.centring (blum macro only)		▲
I.p.measure/auto.centring (optic, renishaw, matsuura macro)		▲
I.p.measure/auto.centring (optic, renishaw, renishaw macro)		▲
I.p.measure/auto.centring (renishaw macro only)		▲
I.p.measure/auto.centring (OMP600, matsuura macro)		▲
I.p.measure/auto.centring (OMP600, renishaw macro)		▲
Broken tool detection/auto.tool length (mechanical)		▲
Laser broken tool detection (blum)		▲
Broken tool detection/auto.tool length (hybrid system, blum)		▲
External tool breakage (for Chain Magazine, Touch)		▲
External tool breakage (for Matrix Magazine, Touch)		▲
Safety Devices		
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)		▲
操作・保守支援		
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)		▲
Machining Support		
Tailstock		▲
Tool ID system (Balluff format A)		▲
Tool ID system (Balluff, format B)		▲
Tool ID system (Balluff, format C)		▲
Tool IC system		▲
Optional Package		
High-speed high-accuracy package		▲
5th-axis package		▲
High-speed high-accuracy & 5th-axis package		▲
Value package		▲
TRUE PATH		
Grinding function A		▲
Grinding function B (+ 70-bar coolant system)		▲
Grinding function A + automation		▲
Grinding function B (+ 70-bar coolant system) + automation		▲

### CUBLEX-35 External View (Unit: mm(in.))

PC32 PC40 PC49 PC60



### CUBLEX-35 Floor Plan (Unit: mm(in.))

PC32 PC40 PC49 PC60

