SMEC

MCV 400/500

VERTICAL MACHINING CENTER

SMEC CO.,LTD.

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SMEC
Smart One, Global One
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SMEC *Smart One, Global One*

- 1988 - Started as Samsung Heavy Industries Machine Tools Business
- 1989 - Horizontal and vertical machining center technology partnership with OKK Japan
- 1991 - Turning center and vertical machining center technology partnership with Mori Seiki
- 1996 - 5-sided processing center technology partnership with Toshiba
- 1999 - Spun out from Samsung Aerospace Industries and established SMEC Co., Ltd

Samsung
Machine Tools
Engineering
Company

MCV 400
MCV 500

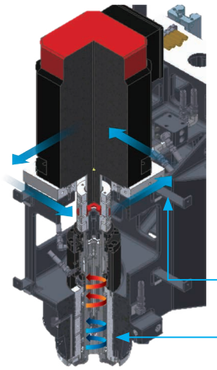
High speed and precision vertical machining center!
High rigidity arch structure!

- Low centered one piece Bed with triangle Rib design
- Biggest X axis stroke(2,100mm) and table in its class
- Realize high rigidity and precision with high rigidity Saddle and arch Column structure
- 4 raws Y axis linear guide way prevent overhang
- High speed and precision direct spindle

Direct drive

To providing powerful cutting and low vibration we adjust direct spindle which has 12,000r/min as an option.
As standard motor base cooling is provided as well as head spindle to realize high precision machining.

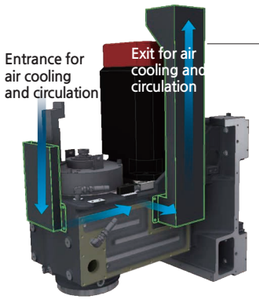
Spindle Speed **12,000** rpm
Spindle Motor **18.5/15/11** kW



Main spindle cooling method

Adopting semipermanent Grease lubrication system on bearing, minimize thermal displacement by Jacket circulation cooling through Fan Cooler on bearing housing, showing stable performance to take longer spindle life time.
Minimize thermal displacement by standard spindle motor base cooling system.
By adopting main and Z, W axis motor base cooling as standard minimize thermal displacement on Y/Z axis.

Spindle motor base cooling(Direct)
Spindle in&out circulation cooling structure



Belt drive

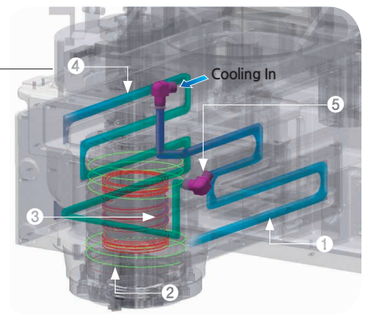
By using 4 raws P4 speedy angular ball bearing reducing temperature increasing and forcing to thermal displacement on belt air fan to realize high speed and precision machining.

Spindle Speed **8,000** rpm
Spindle Motor **11/9** kW
Spindle Speed **12,000** rpm
Spindle Motor **18.5/15/11** kW

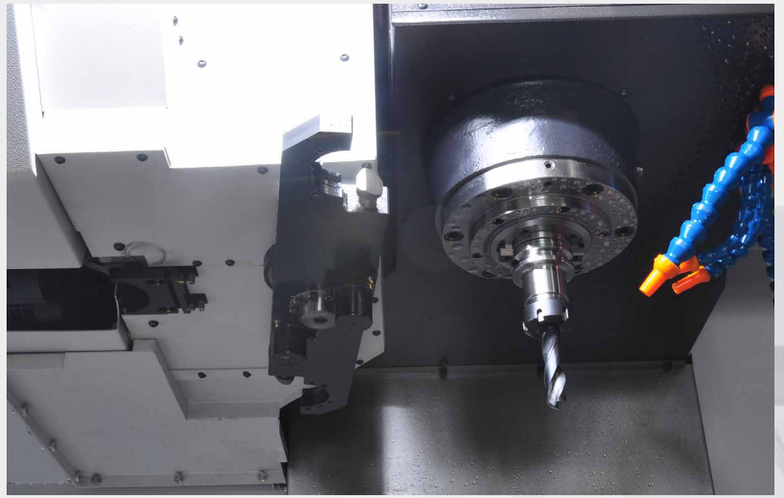
12,000RPM Belt Drive

Minimize thermal displacement by in&out cooling of Head Body.

1. Head body right outside cooling
2. Spindle outside cooling
3. Spindle inside cooling
4. Head body left outside cooling
5. Head body front outside cooling



High-speed tool changer being driven by enhanced technologies

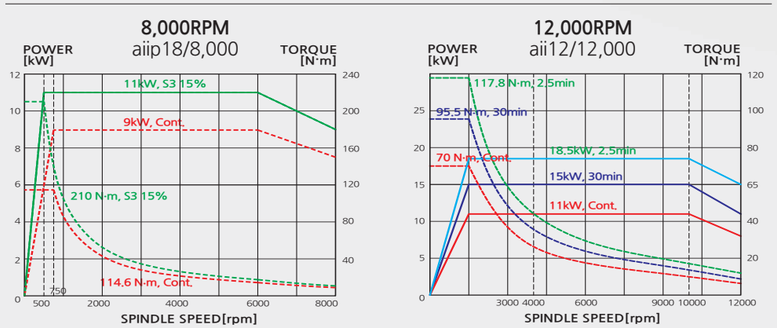


Double Swing arm type auto tool changer

It is Double swing arm swing type by memory random method and has no error during tool changing and minimize idle time.

Tool to Tool : **1.3sec**

Sub-Spindle Power & Torque Diagram

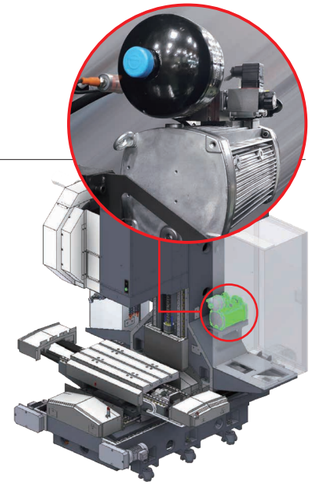


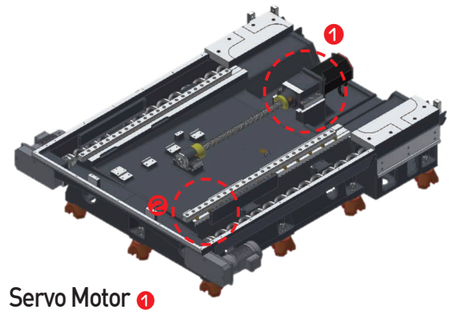
the most advanced mechanism of high-speed technology

HYD. UNIT (HAWE Hydraulic)

By using HAWE Hydraulic Unit from Germany product we realize that life time enhancement and lower power consumption with high reliability.

- Adopting accumulator
  Enhance durability and tool change time by friction down of each internal part through reducing pumping time
- Epoch-making power consumption down(90%) by using pump when actuator is working(In case of HYD. UNIT)

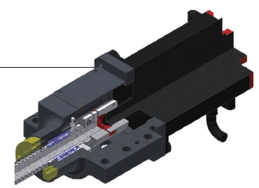




Servo Motor ❶

All axis are connected by servo motor directly in order to realize precision axis moving.

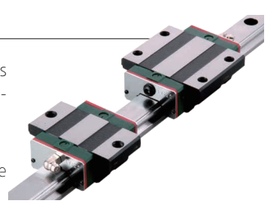
- There is no intermediate channel to transmit power but using coupling
- Minimize back lash during axis moving



Guide Way ❷

The use of LM Guides with superb responsiveness increased rapid traverse speeds and reduced non-cutting time while minimizing noise during travel.

- Strengthen speed, rigidity, durability
- Much better durability comparing with Ball LM Guide to realize precision moving and longer life time



Z-Axis column & headstock

Wide surface with high rigidity column stabilize heavy duty cutting.

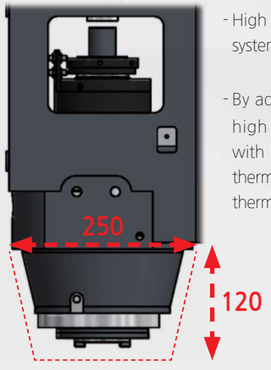
X-Axis saddle & table

Wide surface saddle realize high precision machining during long working hour.

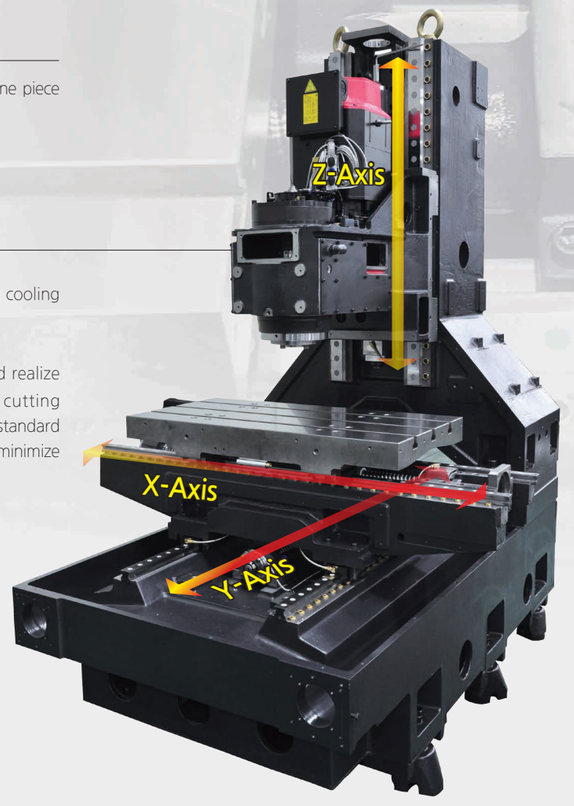
Y-Axis bed & saddle

By adopting low centered Box structure with high rigidity one piece bed and wide span saddle minimize overhang.

High performed spindle



- High precision and efficient cooling system
- By adopting Quill type head realize high speed and precision cutting with high rigidity. Making standard thermal release structure to minimize thermal displacement.



X-Axis
770 mm (MCV 400)
1,050 mm (MCV 500)

Y-Axis
430 mm (MCV 400)
540 mm (MCV 500)

Z-Axis
510 mm (MCV 400)
520 mm (MCV 500)

Octagonal ATC/MG

Designed with a standard 30 tool magazine, offering the largest-in-class magazine capacity, with short travel distance to enable quick tool changes.

Magazine Capacity : **30ea**

Pendant arm / Operation panel

Pendant/panel design by considering user space and convenience improve working environment

High efficiency Spindle Head Cooling System

For long-term continuous high-speed operation, a coolant system may be installed to maintain room temperature. The coolant system circulates coolant oil around the spindle bearings to prevent thermal expansion due to the spindle temperature, ensuring high precision machining.

Automatic Lubrication Dispenser

- Pump Unit : AMZ-III-100S-30LP (LUBE)
- Oil Used : ISO Viscosity Grade 68
- Tank Capacity : 3ℓ (0.79gals)
- Output Flow : 90cc/min(50HZ), 100cc(60HZ)
- Output Pressure : 1.5MPa(15kgf/cm^2)
- Output Power : 18W(50HZ)/19(60HZ) x AC100

Fully enclosed Splash Guard!

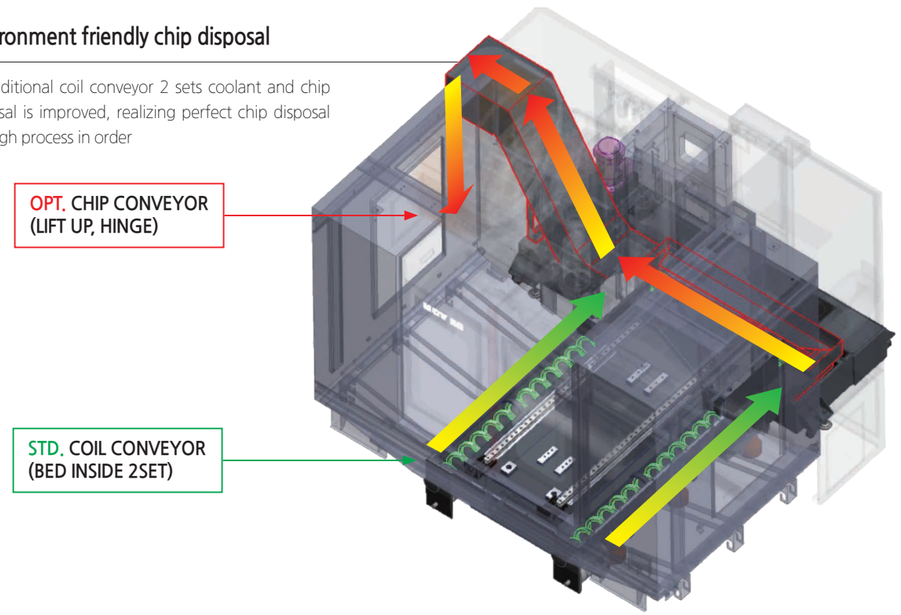
- ATC M/G 시야 확보

User friendly design

- When door opened crane can move in up to middle of table so it provides excellent convenience when heavy work piece moving.
- Minimize distance from cover to table for user friend

Environment friendly chip disposal

By additional coil conveyor 2 sets coolant and chip disposal is improved, realizing perfect chip disposal through process in order



High rigidity & performance travel system

Travel type

Directly connecting with servo motor(Y/Z)

There is no intermediate channel to transmit power but using coupling and minimize back lash during axis moving

Roller type LM guide axis moving system

Best-in-class high performance guideways (for all axes)

Speed → Reducing unnecessary time to move faster and stable

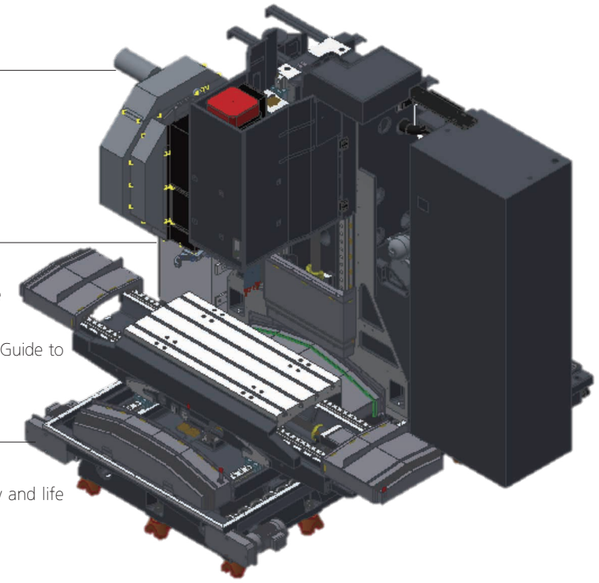
Rigidity → Strengthen axis moving during heavy cutting

Durability → Much better durability comparing with Ball LM Guide to realize precision moving and longer life time

Applied 4 raws bearing for all axis(X-Y-Z)

High rigidity with 4 times the lifetime

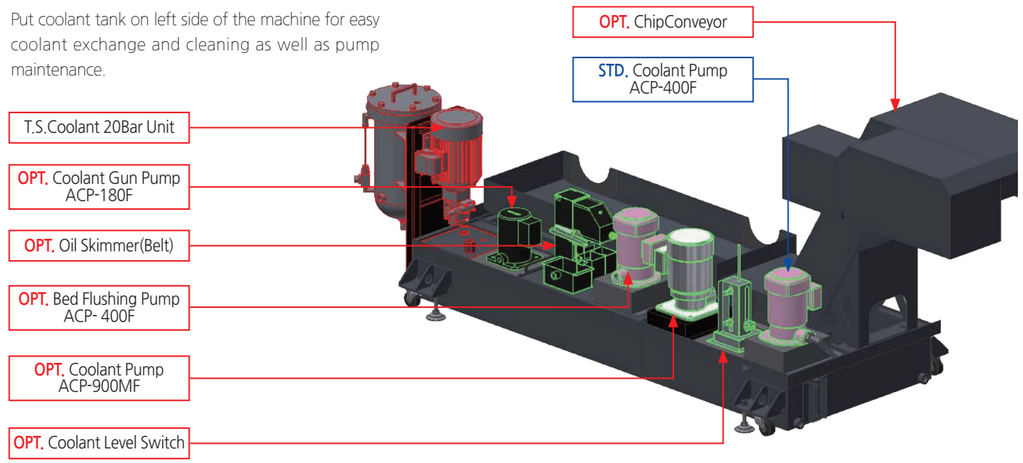
By sustaining 8 bearings on each axis realizing high rigidity and life time.



Automatic Lubrication Dispenser

Removable coolant tank

Put coolant tank on left side of the machine for easy coolant exchange and cleaning as well as pump maintenance.



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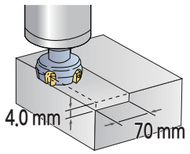
Cutting Capacity (BT40 11/15KW)

Face mill Carbon Steel (SM45C)

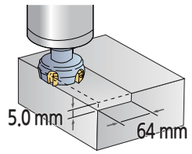
Ø100mm Face mill (5Z)



Cutting amount
182 ㎤/min
Spindle speed
600 r/min
Feedrate
650 mm/min

Face mill Alumium (AL6061)

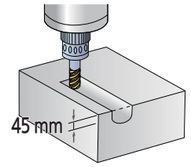
Ø80mm Face mill (5Z)



Cutting amount
403 ㎤/min
Spindle speed
1,500 r/min
Feedrate
1,260 mm/min

End mill Carbon Steel (SM45C)

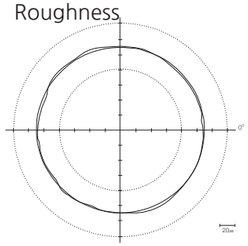
Ø30mm End mill (6Z)



Cutting amount
65 ㎤/min
Spindle speed
230 r/min
Feedrate
48 mm/min

High Precision

Roughness

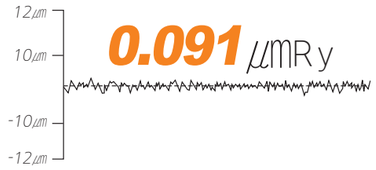


5.80㎛

Roundness

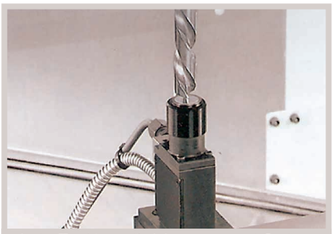
Machine	*LCV 400*
Material	*A 1050P*
Tool	*Ø25×4T*
Spindle Speed	*1,500RPM*

Surface Roughness <O.D. cutting>



0.091 ㎛Ry

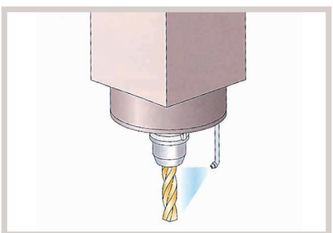
Optional Accessories



Auto Tool Length Measurement System

Gun Coolant

Linear Scale Feed Back System



Oil Mist System

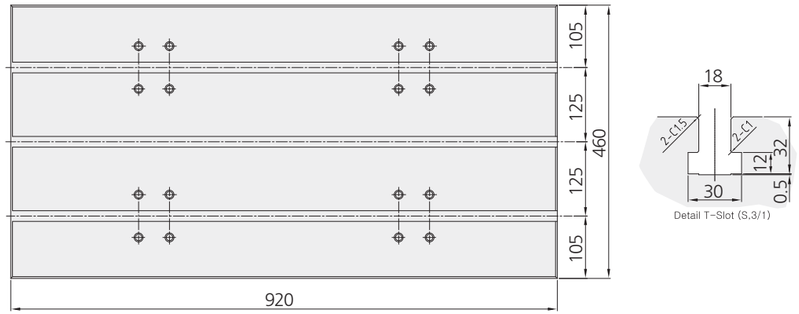
Cnc Rotary Table

Chip Conveyor

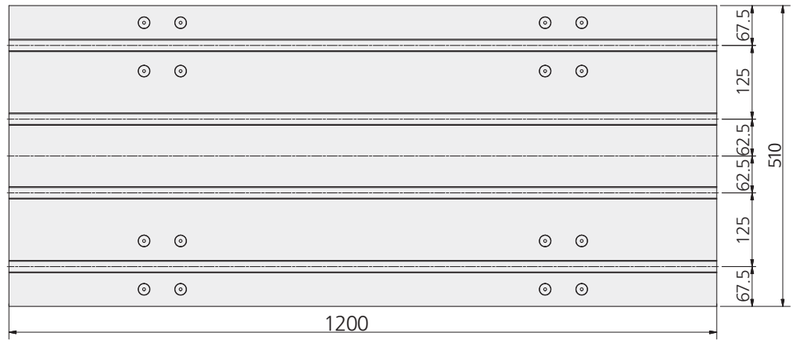
Table & T-Slot

Unit : mm

MCV 400



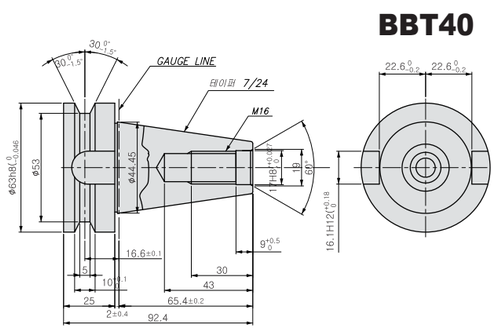
MCV 500



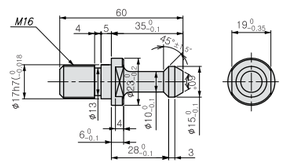
Tool Shank

Unit : mm

BBT40



PULL STUD



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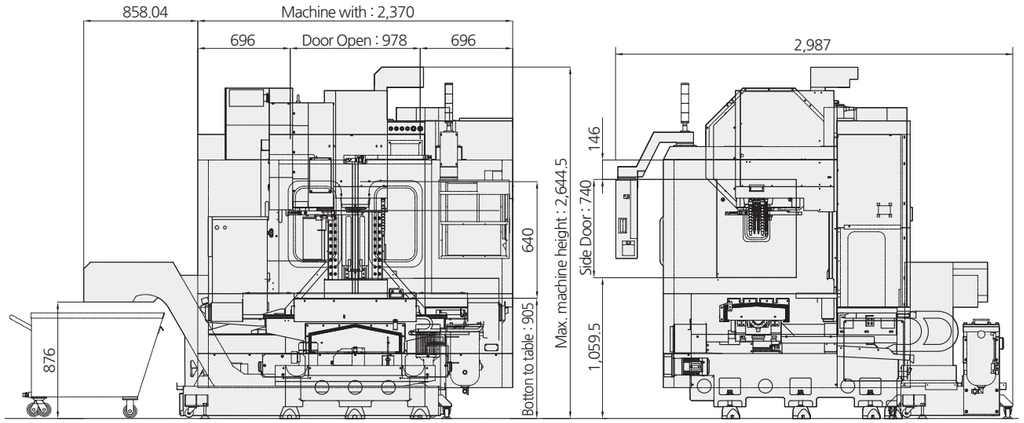
Machine Dimensions

Unit : mm

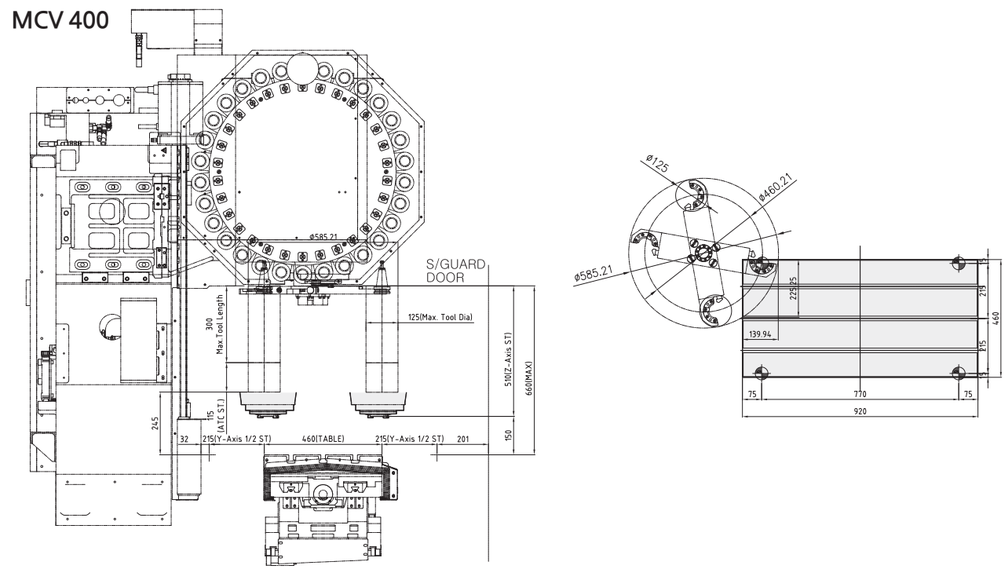
MCV 400



ATC Interference

Unit : mm

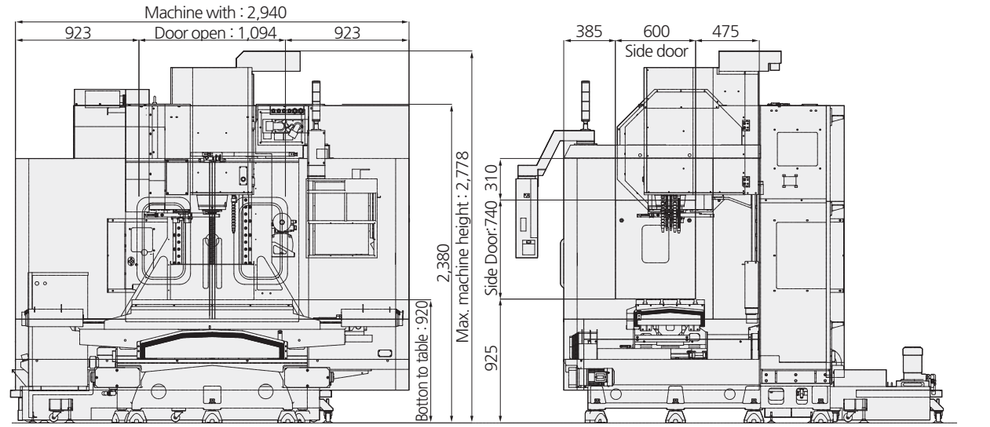
MCV 400



Machine Dimensions

Unit : mm

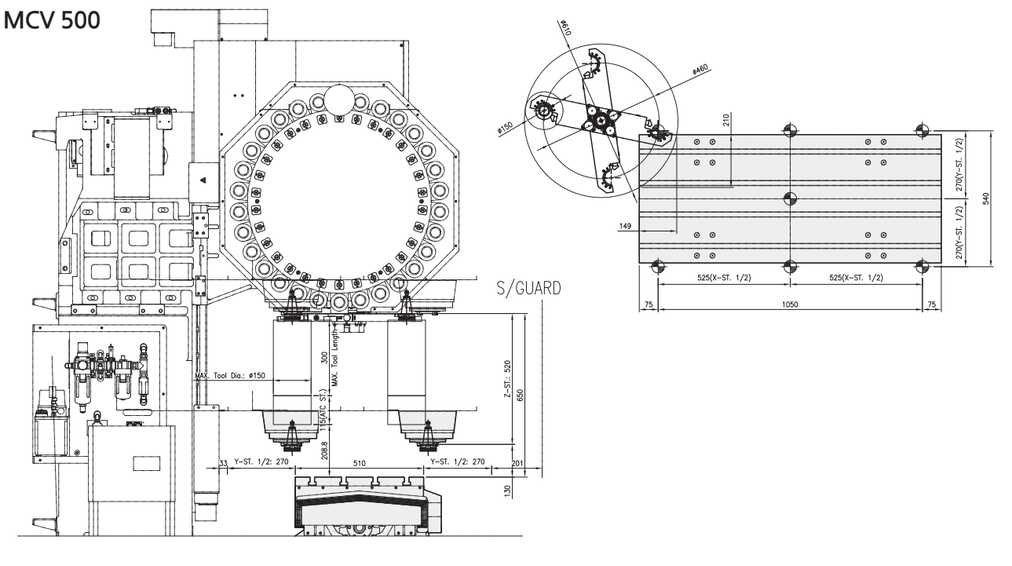
MCV 500



ATC Interference

Unit : mm

MCV 500



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Machine Specification

Item			MCV 400	MCV 500
Travel	X-axis	mm	770	1,050
	Y-axis	mm	430	540
	Z-axis	mm	510	520
	Distance from table surface to spindle nose	mm	150~660	130-650
Table	Table Size	mm	920×460	1,200×510
	Loading capacity	kgf	500	800
	Table & T Slot	mm	18H8×p125×3ea	18H8 T-slot×p125×4ea
Spindle	Max. Spindle Speed	rpm	Direct 12,000(Belt 8,000/12,000)	Direct 12,000(Belt 8,000/12,000)
	Maximum Torque(cont./30min)	N.m	Direct 70/95.5 (Belt 114.6/210[8,000], 70/95.5[12,000])	Direct 70/95.5 (Belt 114.6/210[8,000], 70/95.5[12,000])
	Bearing inner Dia.	mm	Ø70	Ø70
	Spindle Drive Motor(30min/Cont.)	kW	Diret 11/15 (Belt 9/11[8,000], 11/15[12,000])	Diret 11/15 (Belt 9/11[8,000], 11/15[12,000])
	Feed motor(X/Y/Z)	kW	1.8 / 1.8 / 3	3 / 3 / 3
Feedrate	Rapid Traverse(X/Y/Z)	m/min	36 / 36 / 30	36 / 36 / 30
	Feedrate(X/Y/Z)	mm/min	1-10,000	1-15,000
ATC	Tool Shank	-	BBT40(BT40)	BBT40(BT40)
	Tooling changing method	-	Double Arm Swing	Double Arm Swing
	Tool Changing Time(T-T)	sec	1.3(60Hz), 1.6(50Hz)	1.3(60Hz), 1.6(50Hz)
	Magazine Capacity	ea	30	30
	Tool Selection	-	Memory Random	Memory Random
	Max. Tool dia [adjacent empty]	mm	Ø80[Ø125]	Ø80[Ø125]
	Max. Tool Length/Weight	mm/kgf	300 / 8	300 / 8
	Pull stud type	-	MAS P40T-1	MAS P40T-1
Power Supply		kVA	32	32
Floor Space (L×W×H)		mm	3,000×2,370×2,645	3,192×2,977×2,778
Machine Weight		kgf	5,500	6,700
CNC System			Fanuc 0i-MF	

※Design and specifications subject to change without notice.

Standard Accessories

- Full splash guard
- Coolant system
- Leveling parts (Level plate, bolt, etc.)
- Standard tools and tool box
- Lubrication system
- Work light (LED)
- 3 step patrol lamp
- Rigid tapping
- Spindle override
- Spindle tachometer
- Hyd. Unit (Direct motor only)
- Door inter lock
- Oil cooler
- KCS specification
- MPG handle
- Manual and parts list
- Coil Conveyor

Optional Accessories

- Air gun
- Air blow
- Coolant gun
- Rotary table
- Oil skimmer
- Coolant level gauge
- Bed flush
- Through spindle coolant (TSC 20Bar)
- MPG handle(3ea)
- Air conditioner for electric cabinet
- Tool measuring system
- Tool measuring tool (BLUM)
- Lift-up chip conveyor (HINGE TYPE / SCRAPPER TYPE)

NC Specifications / FANUC 0i-MF

Item		Description
Controlled axes	Controlled axes	X, Y, Z, (A)
	Max. simultaneously controlled axes	Positioning (G00)/ Linear Interpolation (G01) Circular Interpolation (G02, G03)
	Least input increment	0.001 mm / 0.0001"
Spindle function	Spindle speed control	S5 (5 Digit)
	Spindle speed override	50~120%
	Spindle orientation	M19
Feed function	Feedrate override (10% increase)	0~200%
	Dwell	G04
	Reference position return	G27 / G28 / G29 / G30
	Manual pulse generator	0.001/0.01/0.1mm
	Cutting feed override	0 ~ 5,000 mm/min
	Rapid traverse override	F0(Fine Feed), 25/50/100%
Tool function	Tool number command	T2(2 Digit)
	Tool nose radius compensation	G43 / G44
	Tool radius compensation	G41 / G42
	Tool offset pairs	400 EA
	Tool geometry / wear offset	G90 / G91
Programming function	Canned cycle	G70 ~ G72 / G74 ~ G76 / G80 / G83 ~ G88
	Decimal point input	Able to input up to decimal point
	R command circular interpolation	R radial programming without using I, J, K values
	SUB program	4 phase
	Work coordindate system	G54 ~ G59
	Local / machine coordinate	G52 / G53
	Max program dimension	±99999.999mm
Tape Functions	M function	M3 (3 digit)
	Input code	ISO/EIA auto recognition
	I/O interface	RS232C
	Program storage space	512 Kbyte
	Number of stored programs	400ea
Other features	Display unit / MDI	8.4" color LCD / Soft input type MDI
	Display unit / MDI	10.4" color LCD / Soft input type MDI
	Synchronized tapping	Rigid tapping function
	Background editing	Program saving / editing during automatic operation
	Backlash compensation	Pitch error offset compensation for each axis
	Search function	Sequence / program number search
	Safety function	Emergency stop / overtravel
	Program test function	Machine Lock / Single Block
	Control function	Memory / MDI / Manual
	Mirror image	M75 / M76
	Custom macro	#100 ~ #199, #500 ~ #999