SMEC

MCV 6700/6700L

VERTICAL MACHINING CENTER

Ⓒ SMEC 2018.03-NO.1

SMEC **SMEC CO.,LTD.**

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

S M E C

Company
Engineering
Machine Tools
Samsung
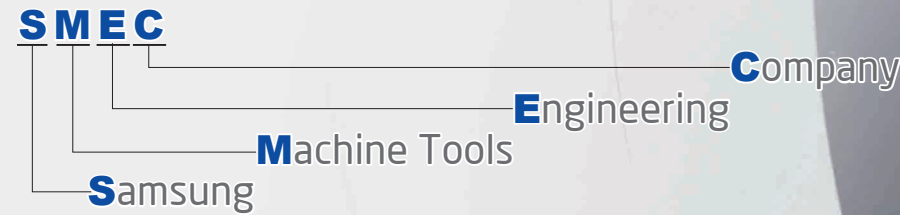
MCV 6700
MCV 6700L

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

- Low centered one piece Bed with triangle Rib design
- Biggest X axis stroke(MCV 6700:1,600mm, MCV 6700L:2,100mm) and table in its class
- Realize high rigidity and precision with high rigidity Saddle and arch Column structure
- 4 raws Y axis LM guide way prevent overhang
- High speed and precision direct spindle

Direct head

Spindle Speed
12,000 rpm

Spindle Motor
11/15/18.5 kW
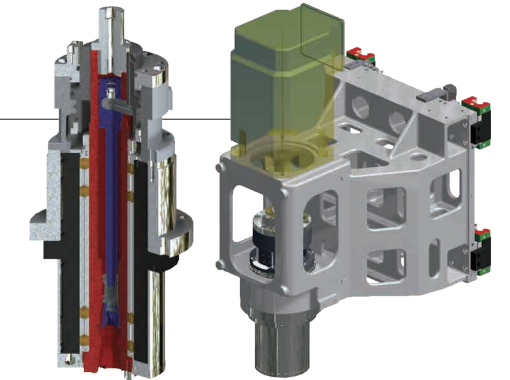
Spindle is sustained by 4 raws P4 speedy angular ball bearing reducing temperature increasing to realize high speed and precision machining.
By adopting Direct Drive type spindle minimize vibration to excellent machining for nonmetal surface finishing.
Motor direct type is connected by coupling without extra power transmission.
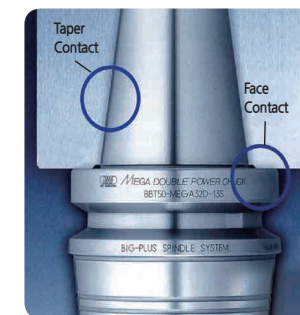
JACKET circulation cooling system

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.
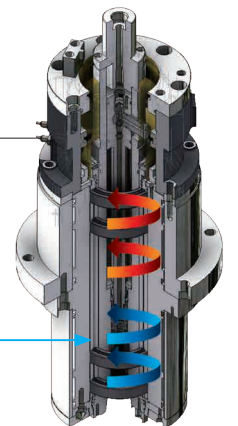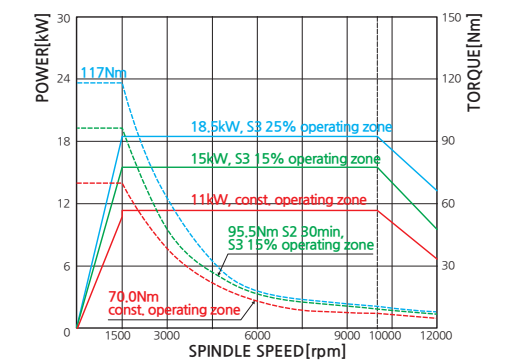
JACKET circulation cooling

Dual Contact Spindle (BBT40)

Dual contact system to contact both main spindle surface and taper surface dually by measuring elastic deformation of spindle surface that occurs when main spindle is clamped.
- Simultaneous contact to both main spindle surface and taper increases rigidity and reduces vibration.
- Increases machining capacity and surface roughness even under harsh condition.
- 100% compatible with existing tools.(BT40)

Taper Contact
Face Contact

Big Plus BBT40(Opt.)
(Simultaneous Dual Contact)

Spindle Power & Torque Diagram

117Nm
18.5kW, S3 25% operating zone
15kW, S3 15% operating zone
11kW, const. operating zone
95.5Nm S2 30min, S3 15% operating zone
70.0Nm const. operating zone

High-speed tool changer being driven by enhanced technologies

Twin 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.
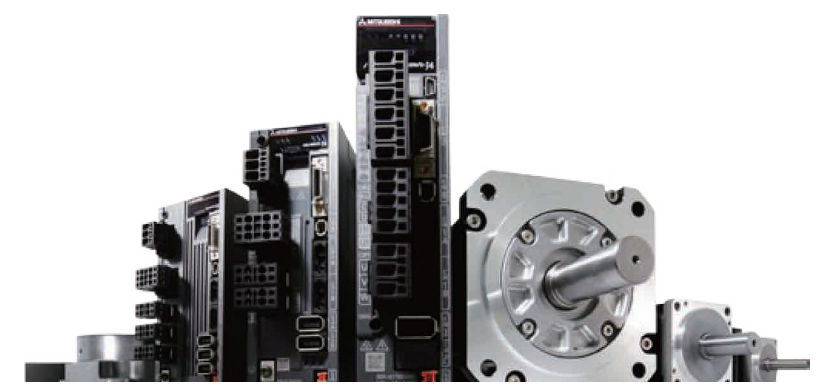
Tool to Tool : **1.2**sec at **60**Hz

Tool Magazine

By adopting 30ea tools as a standard having maximum tool storage capacity in its class. Also, shortest moving system design can set up next tool within short time.

Maximum tool capacity : **30ea**

## the most advanced mechanism of high-speed technology

HYD. UNIT

By using 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)
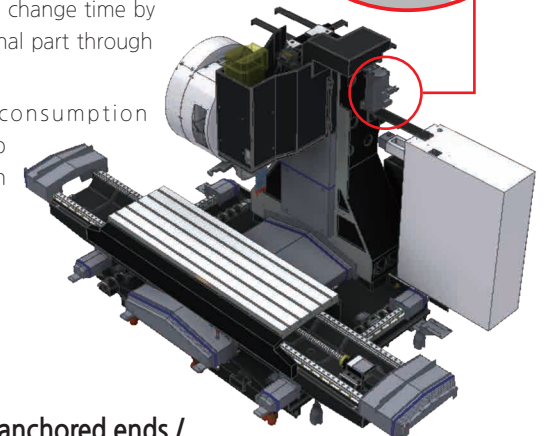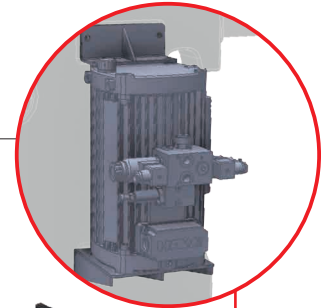
Ballscrew support with anchored ends / Opt. Nut cooling system(X, Y-Axis only)

Reduced changes to load on support bearing due to thermal displacement, while extending support bearing lifetime
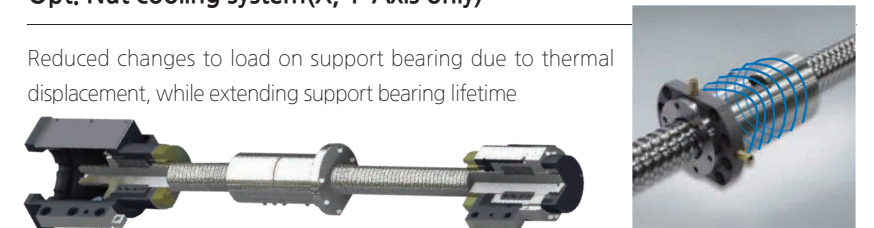
Largest-in-class internal area(MCV 6700L Spec.)

- Wide and stable stroke 〈2,100x670x520mm〉, 〈TABLE : 2,200x660mm〉
- Can fit up to ∅320 rotary table   - Easy wiring/piping for automation

High rigidity Z axis arch column structure

By adopting arch column structure with optimal structural analysis realizing high rigidity and precision machining.

High rigidity Saddle without overhang on X axis

By maximum X axis stroke 2,100mm in its class and high rigidity saddle it is fit for various and stable as well as long work piece machining.

4 raws Guide way bed on Y axis

Bed has 4 raws sustaining method on Y axis and maximum span L/M Guide way structure in its class to minimize over hang.
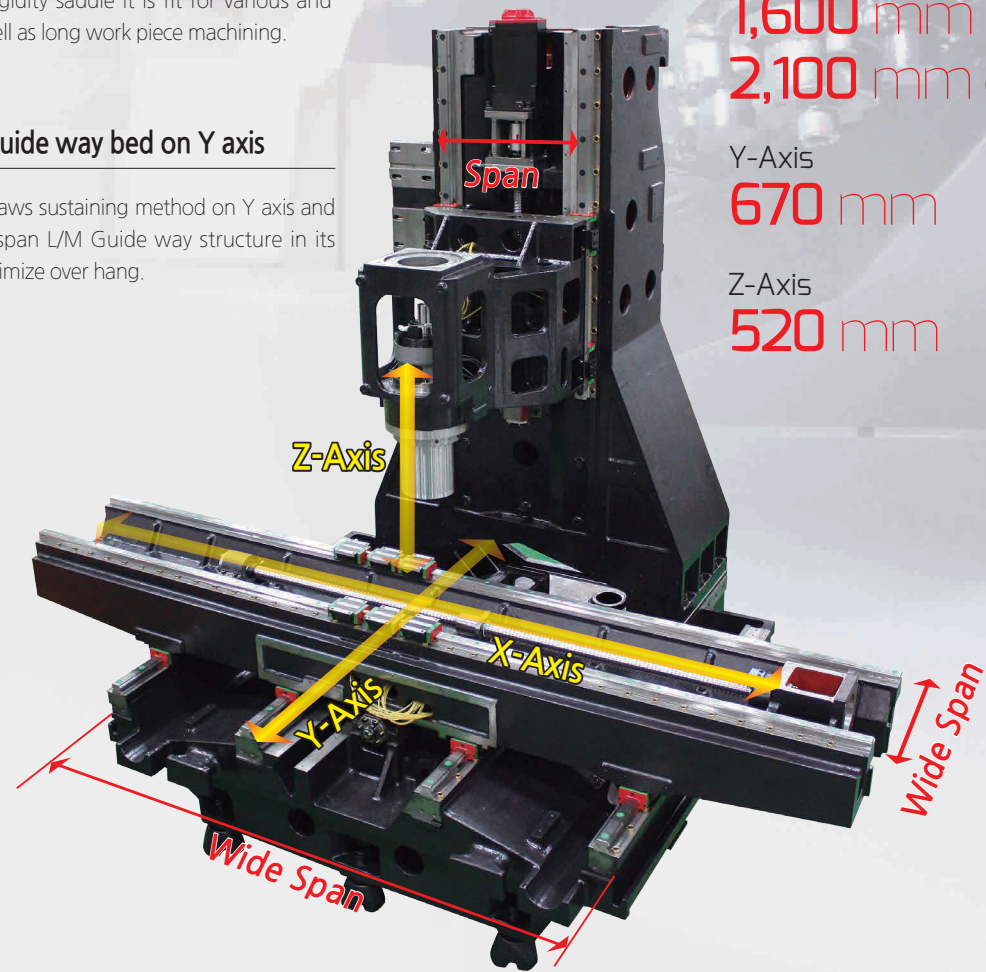
X-Axis
1,600 mm (MCV 6700)
2,100 mm (MCV 6700L)

Y-Axis
670 mm

Z-Axis
520 mm

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.
(Standard at Spindle Speed 12K)

Centralized Pneumatic Utility

Easily check the operation status of items such as lubrication, bearing fluid and air supply.

Roller Guide Way

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
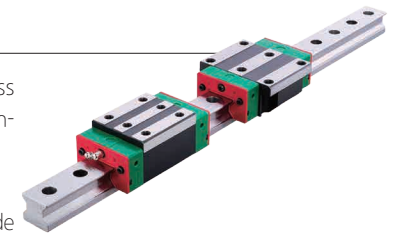
## Automatic Lubrication Dispenser

Automatic lubrication dispenser that reliably dispenses the required amount of lubrication to the required travel axes. Lubrication is only dispensed when the travel axes is in operation, reducing the amount of lubrication that is consumed.
When there is problem on lubrication line it shows warning message on a screen and stop the machine for users safety operation.

Fully enclosed Splash Guard!

Environment friendly chip disposal

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

Bed Coolant Pipe(STD)

Flushing Nozzle

Flushing Nozzle

Coil conveyor 2set

Bucket (Opt.)

Chip conveyor (Opt.)
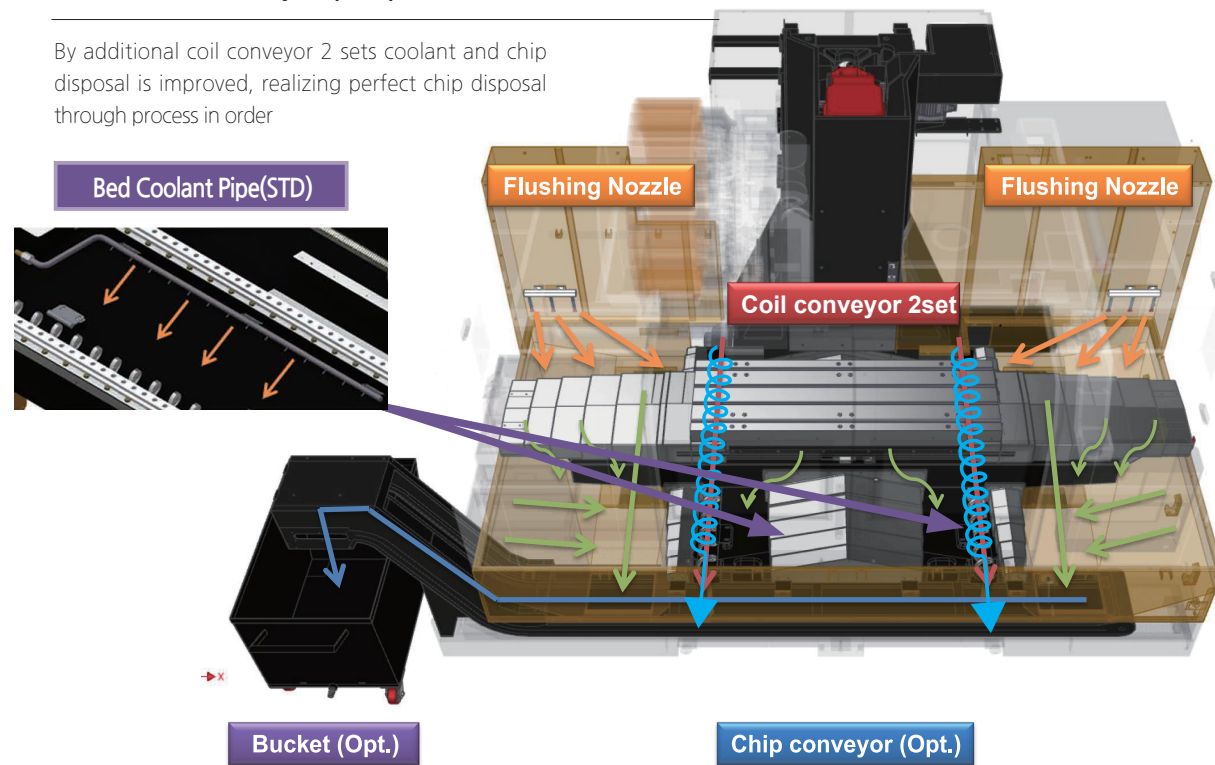
High rigidity & performance travel system

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.
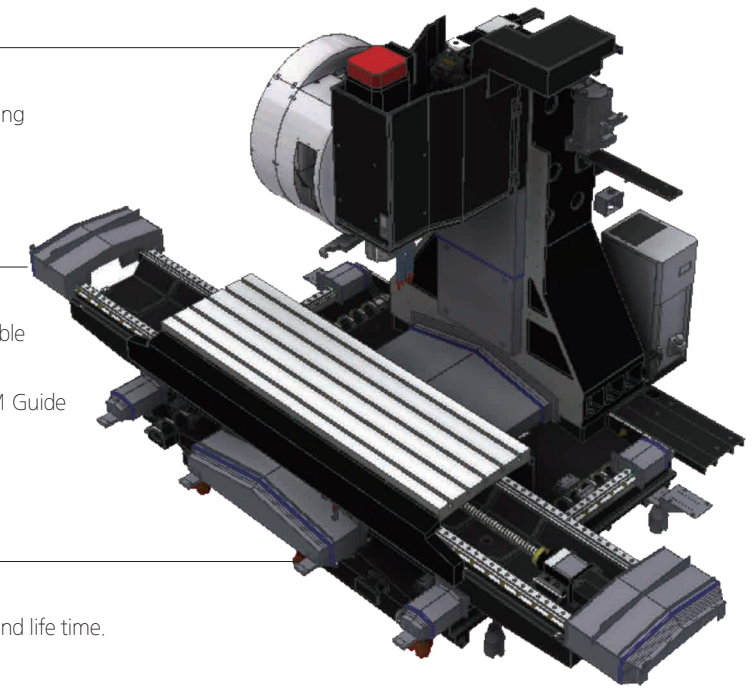
Chip Conveyor & Coolant Tank

Removable coolant tank

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

STD. Bed Flushing Pump

STD. Coolant Pump

OPT. Oil Skimmer(Belt)

OPT. . Coolant Pump

OPT. Bed Flushing Pump

OPT. T.S.Coolant Unit

OPT. Coolant Level Switch

OPT. Coolant Gun Pump

OPT. Oil Skimmer(Belt)
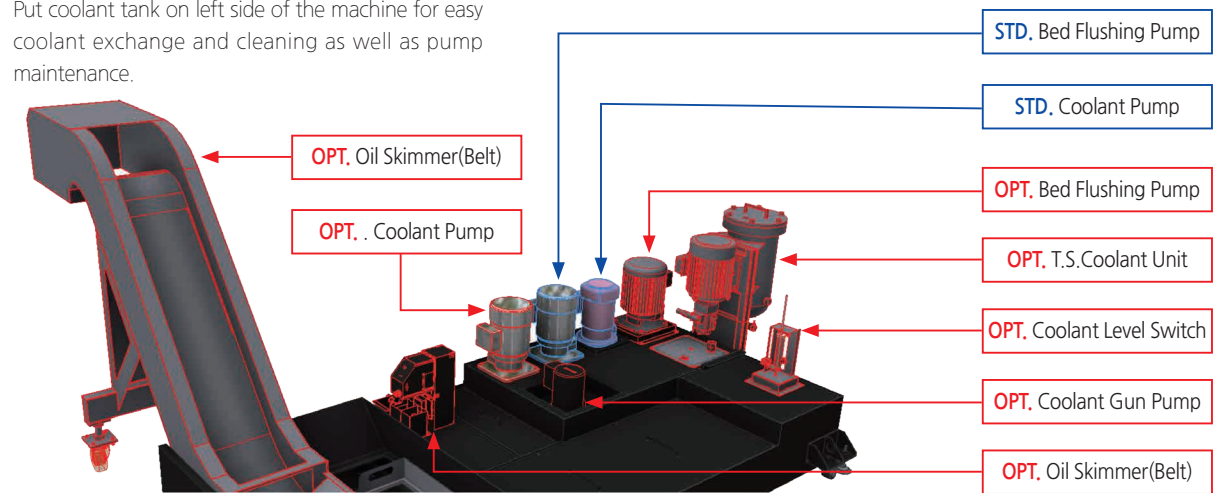
User friendly centralized control panel.

❶ CRT : 10.4 inch color LCD

❷ Bigger BEZEL switch size :
50% larger than the conventional switch size

❸ Addition of MG stand-by tool No

❹ Addition of MG change button

❺ Addition of 4th and 5th axis switch

❻ Spindle Overide
50~120% (15 step)
→ 50~150% (20 step change)
Feed Overide
0~1260 (16 step)
→ 0~5000 (21 step change)

❼ Addition of spare buttons for fixtures

Centralized utility check

Fuse Box Made with Highly Reliable Components

Cutting Capacity (BT40 11/18.5KW)

Face mill   Carbon Steel (SM45C)

Ø100mm Face mill (5Z)

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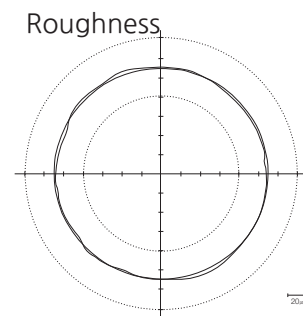Spindle speed
600 r/min
Feedrate
650 mm/min

4.0 mm   70 mm

Face mill   Alumium (AL6061)

Ø80mm Face mill (5Z)

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

5.0 mm   64 mm

End mill   Carbon Steel (SM45C)

Ø30mm End mill (6Z)

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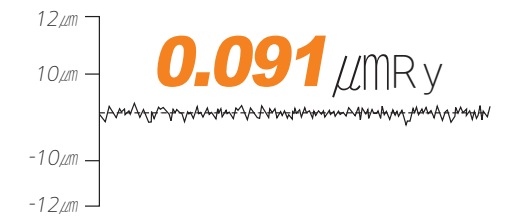230 r/min
Feedrate
48 mm/min

45 mm

High Precision

Roughness

5.80 μm

Roundness	
Machine	MCV 6700L
Material	A 1050P
Tool	Ø25×4T
Spindle Speed	1,500RPM

Surface Roughness <O.D. cutting>

0.091 μmR y

12 μm
10 μm
-10 μm
-12 μm

Opt. SMEC Package 2 (FAST DATA SERVER + AICC II)

FAST DATA SERVER
allowing fast program transmission between PC and data server

1Gb COMPACT FLASH CARD
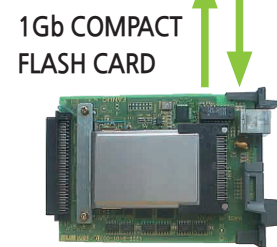
Memory/DNC operation Program Editing

High Precision, High Speed AICC II

CNC MODEL	FOi -MF	31i
Block Look Ahead	200	200
Nano Interpolation	○	○
Decel Before Interpolation	Linear	Linear, Bell-Shaped
Acceleration Setting for Each Axis	○	○
Automatic Corner Deceleration	○	○
Radial Speed Clamp	○	○
Deceleration Speed Clamp	○	○

Optional Accessories

Auto Tool Length Measurement System
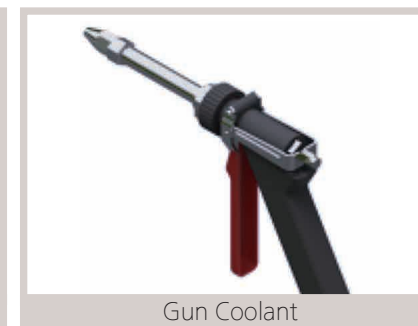
Gun Coolant

Linear Scale Feed Back System
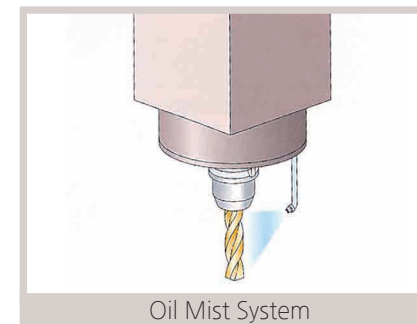
Oil Mist System

Cnc Rotary Table

Chip Conveyor

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Machine Dimensions

Unit : mm

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MCV 6700L
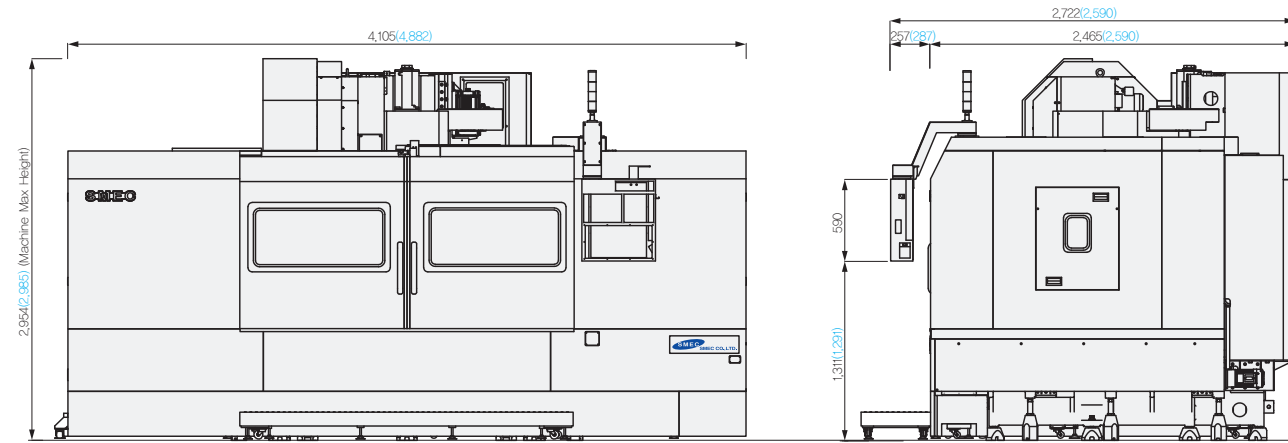
ATC Interference

Unit : mm
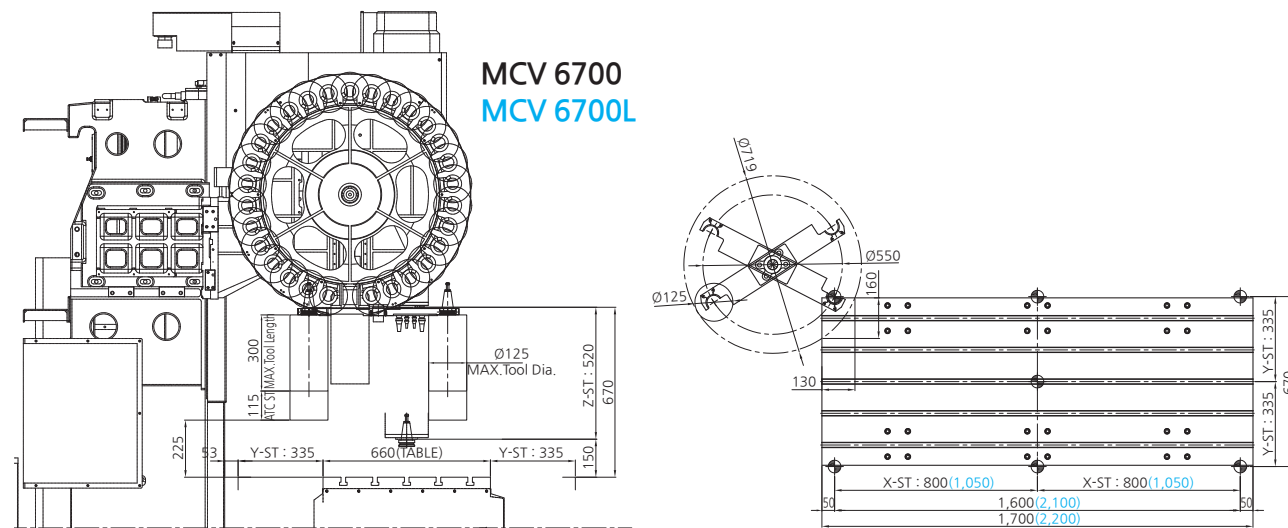
MCV 6700
MCV 6700L

Table & T-Slot

Unit : mm

MCV 6700
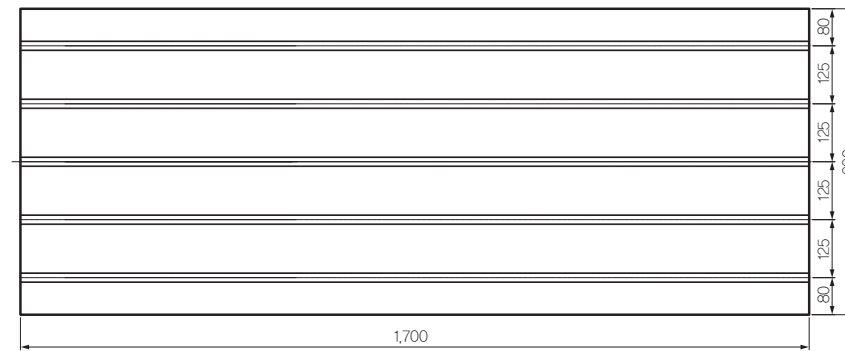
MCV 6700L

Tool Shank

Unit : mm

BT40

PULL STUD

12 13

MCV 6700D/6700L

SMEC Machine Tools

MCV 67000/6700L
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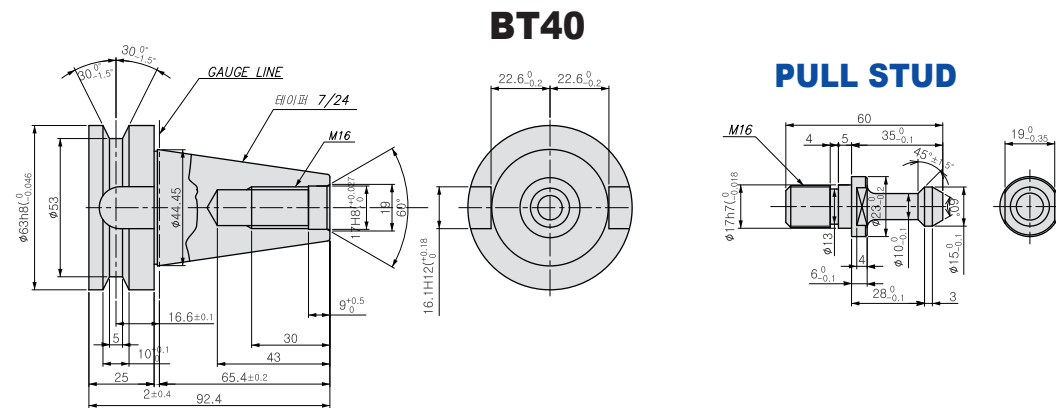
Major Specifications

DESCRIPTION			MCV 6700	MCV 6700L
Travel	X axis	mm	1,600	2,100
	Y axis	mm	670	670
	Z axis	mm	520	520
	Distance from spindle nose to table surface	mm	150~670	150~670
Table	Table size	mm	1,700×660	2,200×660
	Loading capacity	kgf	1,300	1,200
	Table surface	mm	22H8×p125×5ea	18H8 T-slot×p125×5ea
Spindle	Spindle speed	rpm	12,000	12,000
	Torque (Cont. /Max.)	N.m	69.6 / 117.8	69.6 / 117.8
	Bearing inner diameter	mm	Ø70	Ø70
Feedrate	Rapid traverse(X/Y/Z)	m/min	30 / 30 / 30	30 / 30 / 30
	Cutting feedrate(X/Y/Z)	mm/min	1-15,000	1-15,000
ATC	Tool shank	-	BT40(CAT40)	BT40(CAT40)
	Tooling changing method	-	Double Arm Swing	Double Arm Swing
	Tool changing time (T-T)	sec	1.2	1.2
	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 / 7	300 / 7
	Pull stud type	-	MAS P40T-1	MAS P40T-1
Motor	Spindle motor(cont./30min)	kW	15 / 18.5	15 / 18.5
	Feed motor(X/Y/Z)	kW	4 / 4 / 7	4 / 4 / 7
Power supply		kVA	35	35
Floor space (L×W×H)		mm	4,105×3,400×3,000	4,900×3,400×3,000
Machine weight		kgf	8,500	9,500
CNC system			Fanuc Series	

※Design and specifications subject to change without notice. ※( ):Option

Standard Accessories

- Full splash guard
- Coolant system (1.8kW)
- 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
- Door inter lock
- Spindle Head Cooling System
- Bed flushing
- MPG handle
- Manual and parts list

Optional Accessories

- Air gun
- Air blow
- Coolant gun
- Rotary table
- Oil skimmer
- Coolant level gauge
- High Column
- Through spindle coolant (TSC 20Bar)
- MPG handle(3ea)
- Air conditioner for electric cabinet
- Tool measuring system
- Lift-up chip conveyor (HINGE TYPE / SCRAPPER TYPE)
- Mist collector
- AICC II & Data Server

NC Specifications / FANUC Series

Item		Specification	Fanuc Series
Controlled axis	Controlled axes		X,Y,Z,(A,B)
	Max. controlled axes		4(6) AXIS
	Max. simultaneously controlled axes		4
	Least input increment	0.001mm / 0.0001"	○
Operation functions	Manual handle feed	X1, X10, X100	○
	Feed per minute	G94	○
	Feed per revolution	G95	○
Interpolation functions	Linear interpolation	G01	○
	Circular interpolation	G02, G03	○
	Dwell	G04	○
	Cylindrical interpolation	G70.1	○
	Reference position return	G28	○
	Reference position return check	G27	○
Feed function	Rapid traverse feedrate override	F0, 25%, 50%, 100%	○
	Feedrate override		0~200%
Spindle function	Spindle override		○
	Rigid tapping		○
Tool functions	Tool function	T4-Digt / T2-Digt	T2-Digt
	Tool nose radius compensation	G40 ~ G42	○
	Tool offset pairs		400
	Tool geometry / wear offset	GEOMETRY & WEAR DATA	○
	Tool life management		○
	Tool path graphic display		○
	Automatic tool compensation		○
Program input	Absolute / incremental programming		○
	Multiple repetitive cycle	G70 ~ G76	○
	Canned cycle	G90, G92, G94	○
	Inch / metric conversion	G20 / G21	○
	Program restart		○
	Retraction for rigid tapping		○
	Max. programmable dimension	±99999.999mm/±9999.9999"	○
	M function	M3 digit	○
	Custom macro		○
	Canned cycle for drilling		○
	Direct drawing dimension programming		○
	Programmable data input	G10	○
	Optional block skip		○
	Workpiece coordinate system	G52 ~ G59	○
	Number of registerable programs		400EA
Setting and display	Help function	ALARM & OPERATION DISPLAY	○
	Run hour / parts count display	RUNNING TIME & PART NO. DISPLAY	○
	Spindle & servo load display	SPINDLE & SERVO LOAD DISPLAY	○
	Self-diagnosis function		○
	Extended part program editing	COPY,MOVE, CHANGE OF NC PROGRAM	○
	Display screen		10.4" color
Data input/output	Memory card input / output		○
	USB memory input / output		○
Editing operation	Part program storage size	512Kbyte, 256Kbyte	512Kbyte
Manual guide i	Manual Guide I		Opt.