

SMEC

LCV 550/650

VERTICAL MACHINING CENTER



SMEC Co., Ltd.

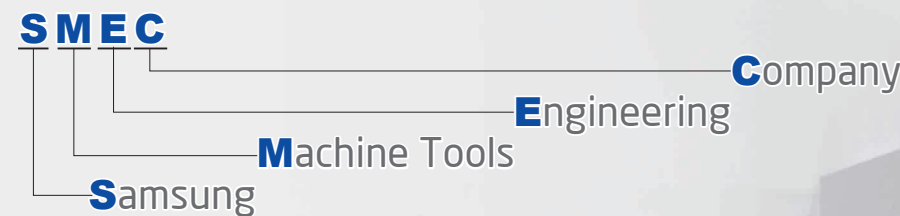
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<http://www.esmec.com>



- 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



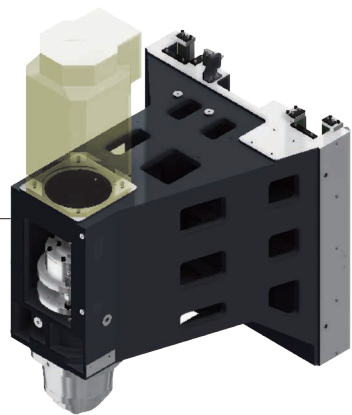
LCV 550
LCV 650

Superb structural design offering
best-in-class heavy duty and precision machining

- High rigidity spindle offering high speed and high precision
- Stable machine structure
- High productivity with short non-cutting time
- Lineup offering various spindle options
 - high speed, high precision direct motor type (8,000 / 12,000rpm)
 - gear motor type (6,000rpm) available with various options such as through spindle cooling
 - built-in spindle type (20,000rpm) for high quality mold machining

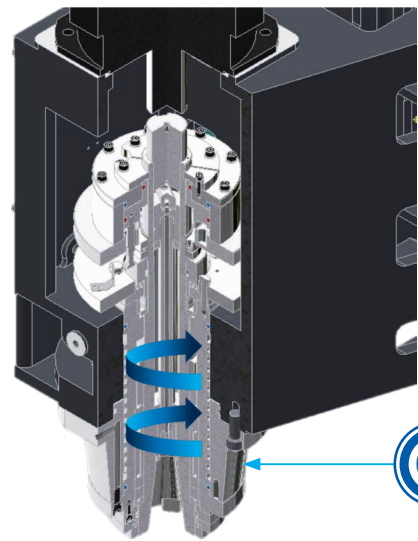
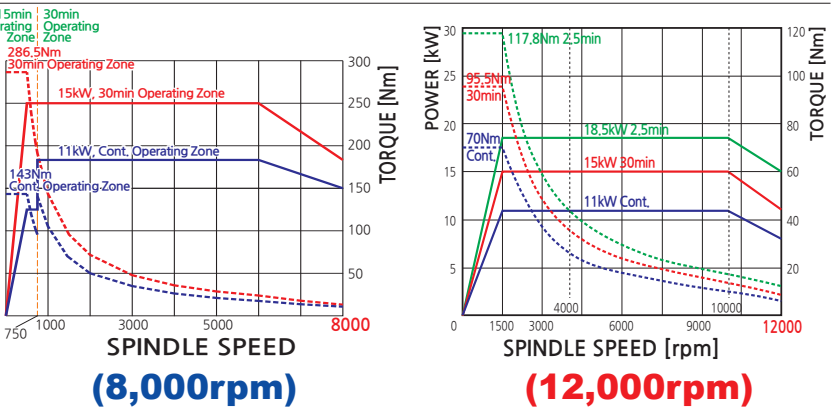
DIRECT HEAD TYPE
[BT50 : Std.] [BT40 : Opt.]

The spindle is supported by four P4 class high precision angular ball bearings to minimize heat increment. Also belt head takes forced heat emission to minimize thermal expansion to provide high speed and ultra precision machining.



Spindle Speed	Spindle Motor	Spindle Torque
8,000 rpm	11/15 kW	286.4 / 143.2 N.m
Spindle Speed	Spindle Motor	Spindle Torque
12,000 rpm	11/15 kW	95.1 / 69.6 N.m

Spindle Power & Torque Diagram

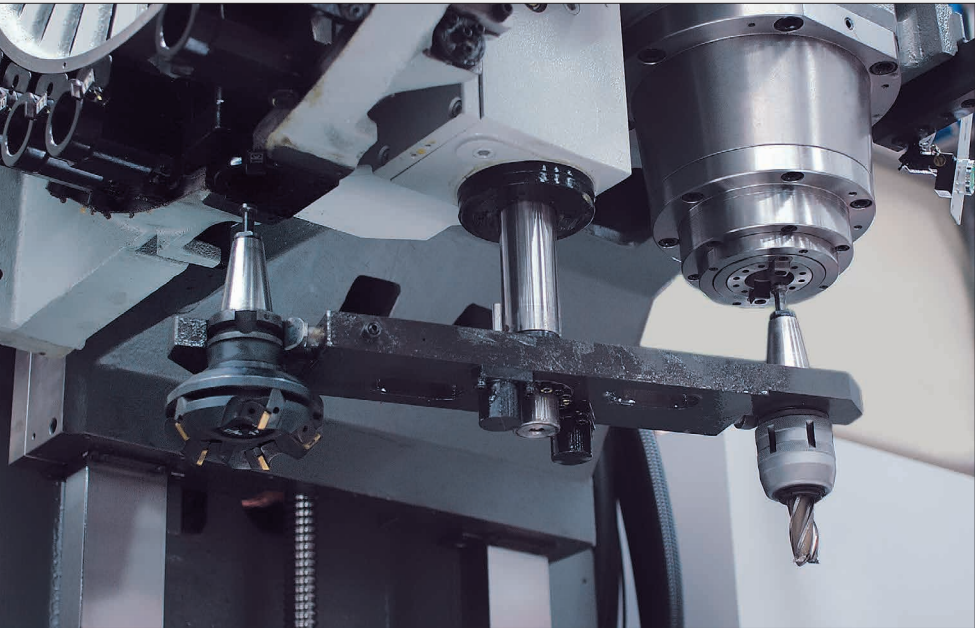


JACKET circulation cooling system

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. (OIL COOLING : OPT.)

Opt. Coolant circulation inside and outside of spindle housing

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 : **2.5sec** at **60Hz**



Tool Magazine

Highest tool storing capabilities in its class to be suitable wide machining area and adopting a cartridge type port for easy repair
(BT50 : 24 Tools, BT30 : 30 Tools)

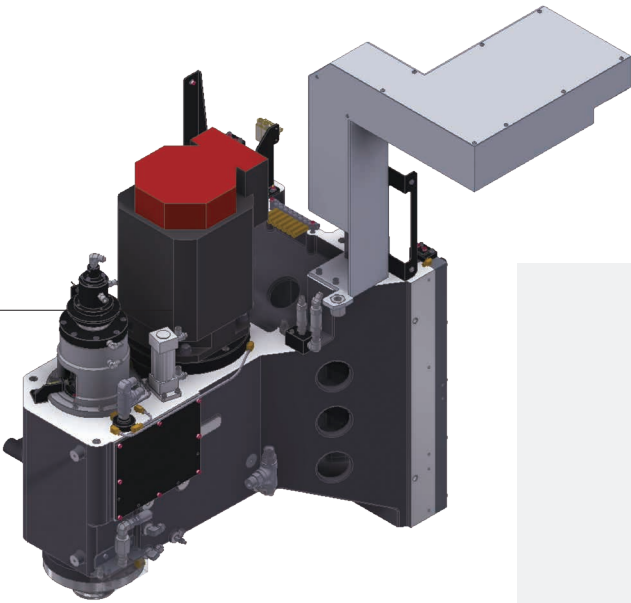
Tool Magazine Capacity(ea) : **24/30(Opt.)**

GEARED HEAD TYPE [BT50]

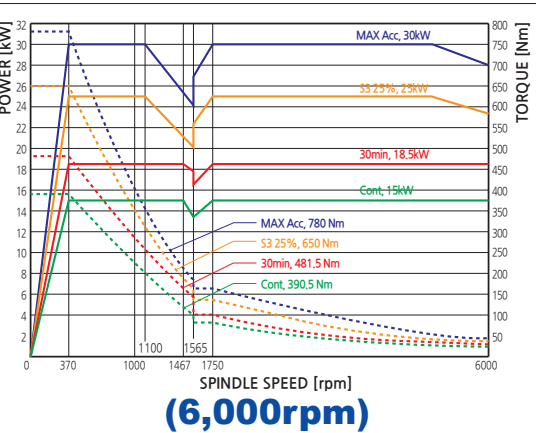
Spindle Speed
6,000 rpm

Spindle Motor
15/18.5 kW

Spindle Torque
481.5 / 390.5 N.m

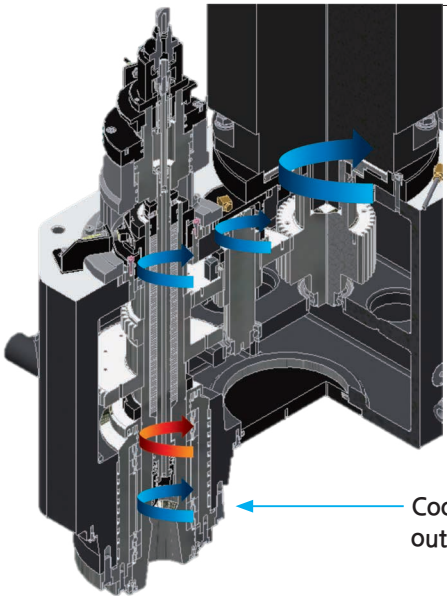


Sub-Spindle Power & Torque Diagram



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.
Highly effective cooling via supply of cooling oil to the gears.



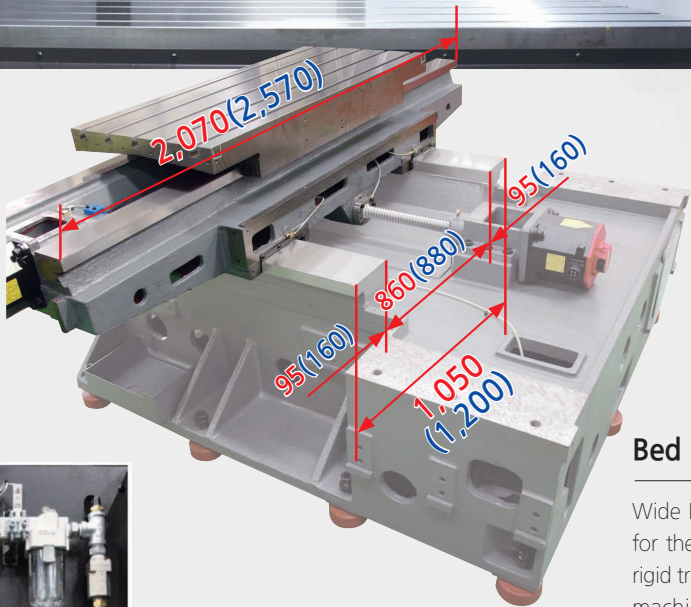
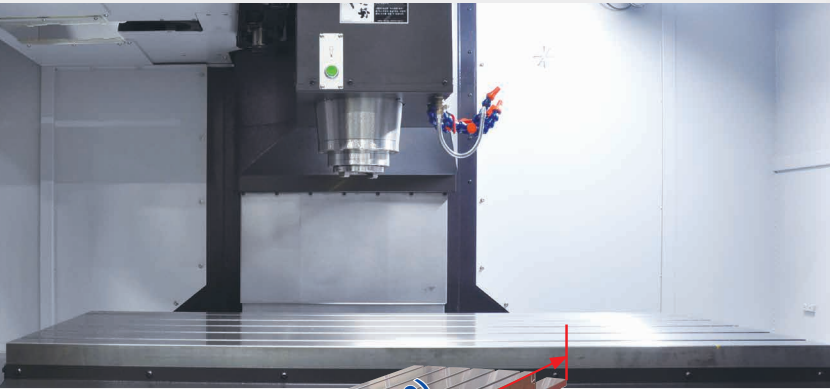
Gear and bearing cooling

Coolant circulation inside and outside of spindle housing

LCV 550/650

VERTICAL MACHINING CENTER

Description		LCV 550	LCV 650
Table Size	mm	1,200×550	1,550×650
Travel(X/Y/Z)	mm	1,150/550/520	1,350/650/635
MAX. Load	kg	800	1,000
Rapid Traverse Rate(X/Y/Z)	m/min	24/24/20	



Bed

Wide Box guideways provide excellent support for the saddle to prevent table overhang, and a rigid triangular rib body structure ensures minimal machine vibration and structural deformation even during heavy machining.



Centralized utility check

With the centralized utility check layout, operators can easily check operation status of lubrication, bearing fluid, air supply. Etc

Saddle : Bed Guide
2,070 : 1,050 (LCV 550)
2,570 : 1,200 (LCV 650)



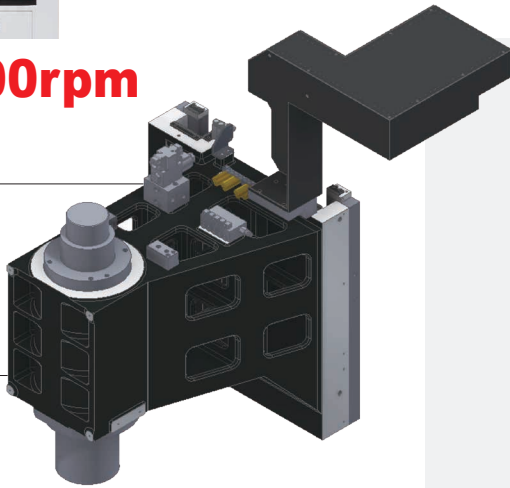
Built-in Type 20,000rpm

High Rigidity, High Precision Spindle

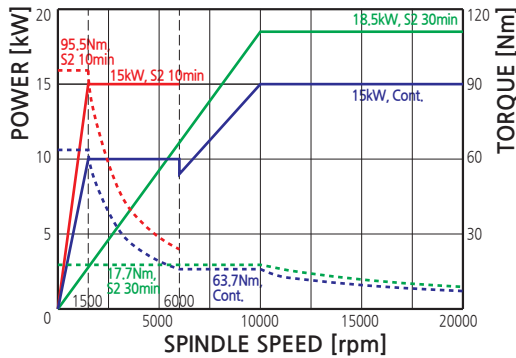
Guaranteeing high rigidity during long-term operation using highly rigid ceramic bearings and air-oil system.

Highest in-class Spindle Speed

Demonstrating highest in-class spindle speed and torque for optimized machining using vibration dampened built-in motor. The 2-sided Big Plus Spindle offers high rigidity and easy tool switching.



Spindle Power and Torque Diagram [BT40]



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. (Built-in : Std.)

Standard only at 12K and above Option at 8K, 6K

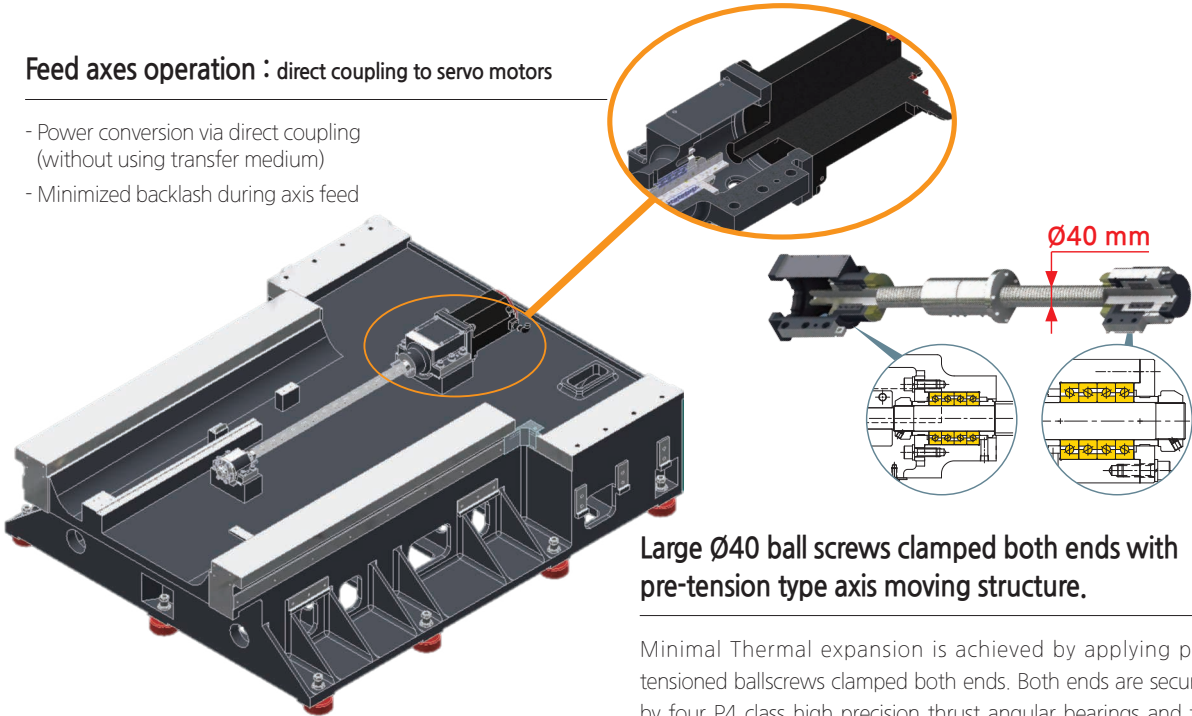


Automatic Lubrication Dispenser

- 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/cm²)
- Output Power : 18W(50Hz)/19(60Hz) x AC100

Feed axes operation : direct coupling to servo motors

- Power conversion via direct coupling (without using transfer medium)
- Minimized backlash during axis feed

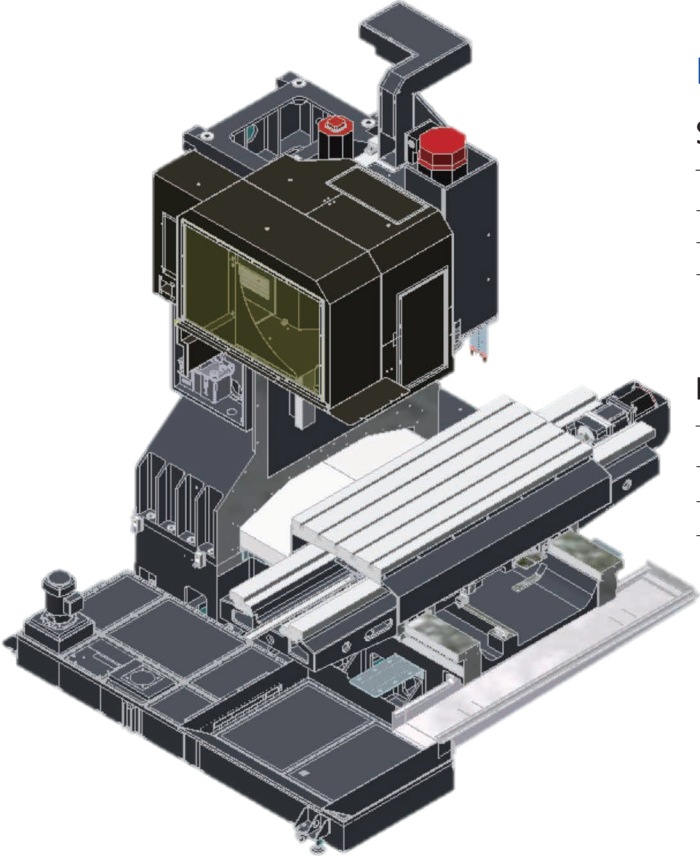
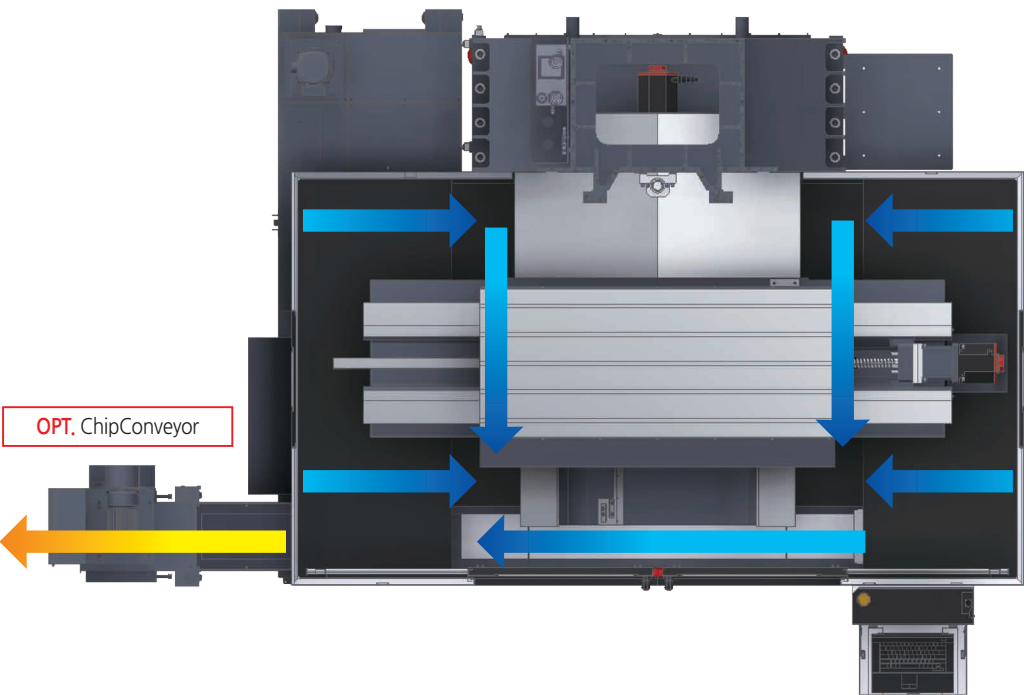


Large Ø40 ball screws clamped both ends with pre-tension type axis moving structure.

Minimal Thermal expansion is achieved by applying pre-tensioned ballscrews clamped both ends. Both ends are secured by four P4 class high precision thrust angular bearings and the bearings are lubricated by forced lubrication system to provide extended life of the bearings.

Designed for superb chip discharge

- Inclined surface on all SLIDE COVERS and BASE COVERS.
- Standard inclined chute installed where chips fall so they are discharged to the coolant tank on the left-side



High rigidity & performance travel system

Stable Machine Structure

- Low center of gravity design and stable wide bed surface
- Heat treated and polished slideways
- High rigidity box-type body with triangular rib structure

Largest-in-Class Internal Area

- Can fit up to Ø320 large rotary table
- Easy to wire/pipe for automation
- Largest-in-class work space



LCV 550

Stroke : 1150x550x520mm (Table: 1200x550mm)

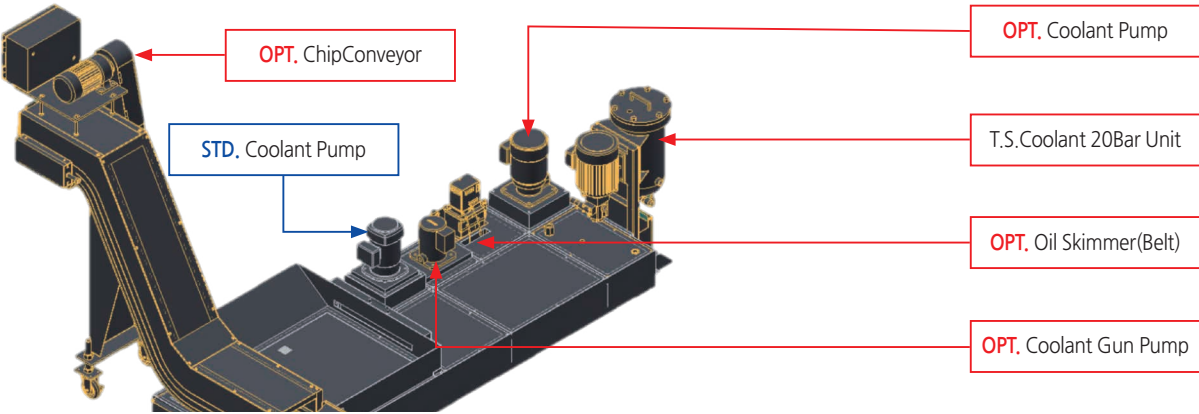
LCV 650

Stroke : 1350x650x635mm (Table: 1550x650)

Automatic Coolant Dispenser

Removable coolant tank

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

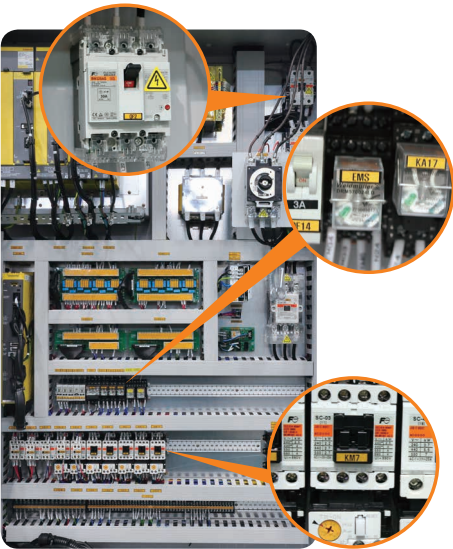


User friendly centralized control panel.



- 1 CRT : 10.4 inch color LCD
- 2 Bigger BEZEL switch size : 50% larger than the conventional switch size
- 3 Addition of MG stand-by tool No
- 4 Addition of MG change button
- 5 Addition of 4th and 5th axis switch
- 6 Spindle Override 50~120% (15 step) → 50~150% (20 step change) Feed Override 0~1260 (16 step) → 0~5000 (21 step change)
- 7 Addition of spare buttons for fixtures

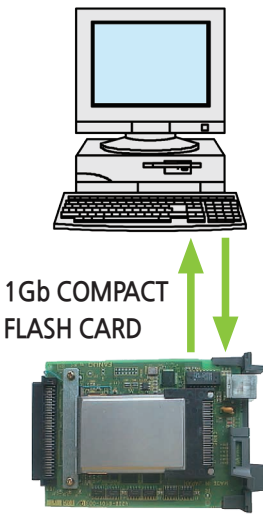
Centralized utility check



Fuse Box Made with Highly Reliable Components

- Magnet switch, circuit breaker, Key S/W(Fuji)
- Relay(Widemuller, Omron)

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



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



High Precision, High Speed AICC II

CNC MODEL	FOi -MD	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	○	○

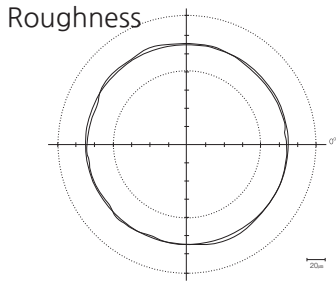
Memory/DNC operation
Program Editing

BT 50에 대한 부분은 영업기술팀으로 문의바랍니다.

Cutting Capacity (BT50 11/15KW)

Face mill	Carbon Steel (SM45C)	Face mill	Alumium (AL6061)	Drill	Carbon Steel (SM45C)
Ø125mm Face mill (6Z)	Cutting amount 288 cm ³ /min Spindle speed 600 r/min Feedrate 450 mm/min	Ø125mm Face mill (6Z)	Cutting amount 507 cm ³ /min Spindle speed 800 r/min Feedrate 1,060 mm/min	Ø60 Drill	Cutting amount 226 cm ³ /min Spindle speed 720 r/min Feedrate 80 mm/min

High Precision



6.75µm

Roundness

Machine	LCV 550
Material	A 1050P
Tool	Ø25×4T
Spindle Speed	1,500RPM

Surface Roughness <O.D. cutting>

0.091µmRy

Optional Accessories



Automatic Tool Length Measurement Unit



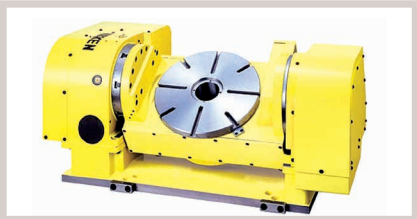
Coolant Gun (With Tank Opt.)



BROKEN TOOL LASER DETECTION SYS.



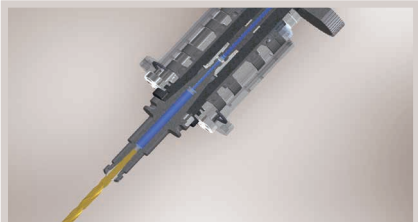
Additional 1-axis



Additional 2-axis



Oil Skimmer (With Tank Opt.)



Thru Spindle Coolant



Linear Scale Feed Back System

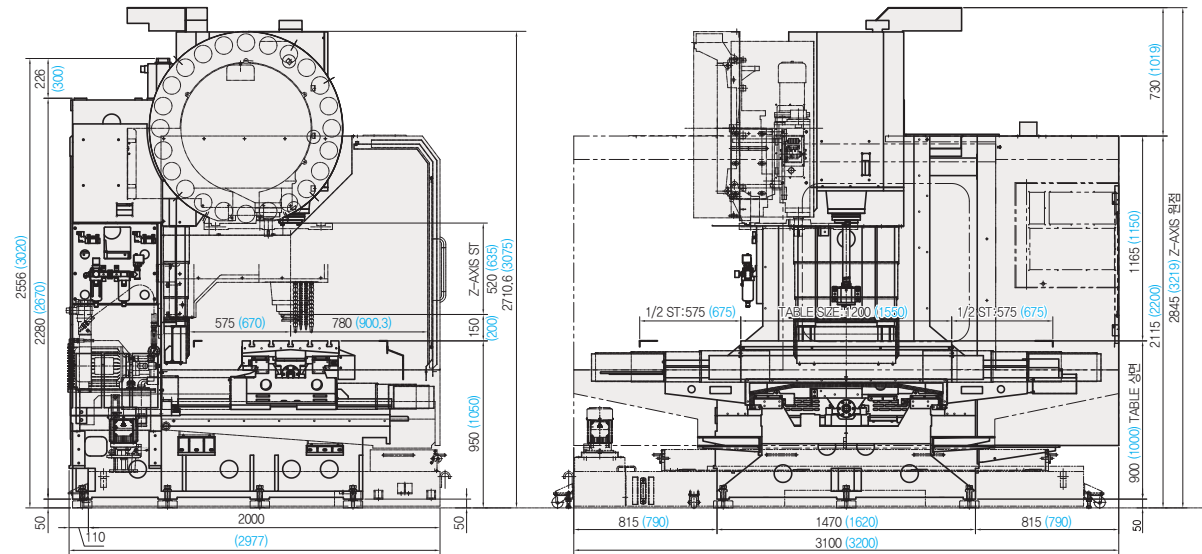


Lift Up Chip Conveyor

Machine Dimensions

Unit : mm

LCV 550
LCV 650



ATC Interference

Unit : mm

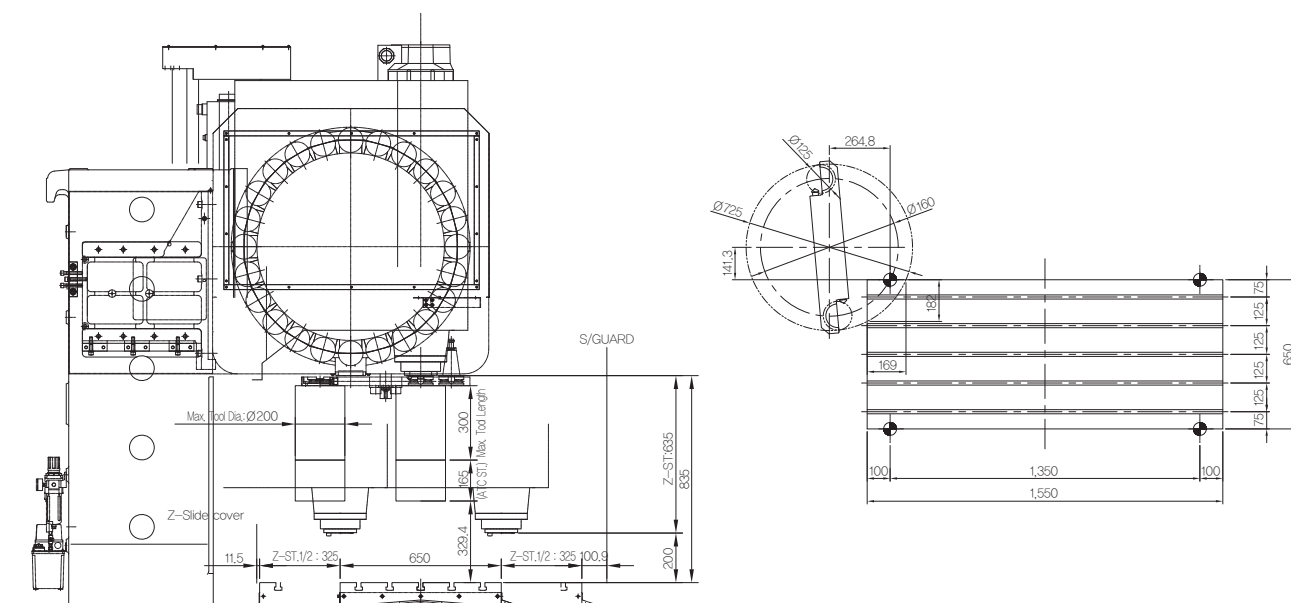
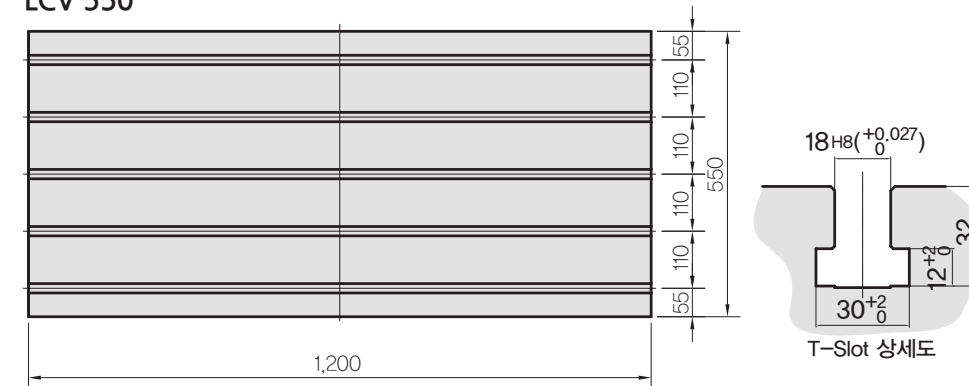


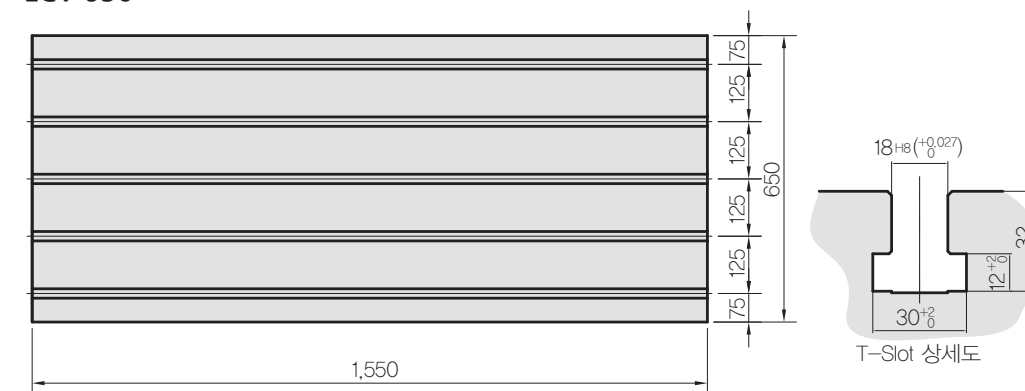
Table & T-Slot

Unit : mm

LCV 550



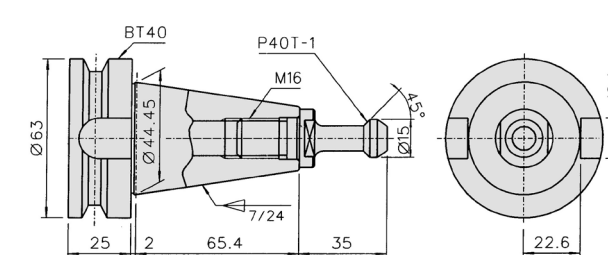
LCV 650



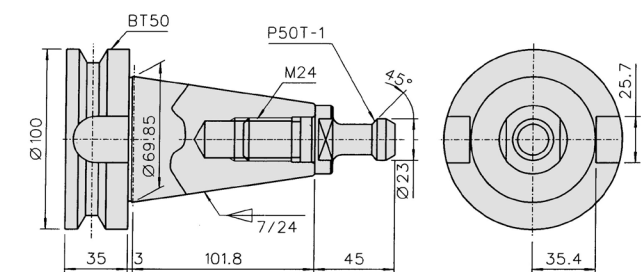
Tool Shank

Unit : mm

BT40



BT50



※Pull stud type for gear spindle drive is MAS P50T-1F(90°)

Major Specifications

DESCRIPTION			LCV 550	LCV 650
Travel	X axis	mm	1,150	1,350
	Y axis	mm	550	650
	Z axis	mm	520	635
	Distance from table surface to spindle nose	mm	150~670	200~835
	Distance from pallet center to column	mm	600	675
Table	Table size	mm	1,200×550	1,550×650
	Loading capacity	kgf	800	1,000
Spindle	Spindle speed	rpm	8,000 (6,000 12,000 20,000)	
	Spindle motor(cont./30min.)	kW	11/15 (15/18.5 11/15 15/18.5)	
	Torque (Max./Cont.)	N.m	286.4/143.2 (481.5/390.5 95.1/69.6 95.5/63.7)	
Feedrate	Rapid traverse(X/Y/Z)	m/min	24/24/20	
	Cutting feedrate(X/Y/Z)	mm/min	1~10,000	
	Feed motor(X/Y/Z)	kW	3/3/3	3/4/7
ATC	Tool shank	-	BT50(BT40, HSK63A)	
	Tooling changing method	-	Double Arm Swing	
	Tool changing time (T-T)	sec	2.5(1.8)	2.5(1.5)
	Magazine capacity	ea	24(30)	
	Tool Selection	-	Memory Random	
	Max. tool dia. [adjacent empty]	mm	Ø125[Ø200]	
	Max. tool length / weight	mm/kgf	300/15(300/7)	300/15(300/8)
	Pull stud type	-	MAS P50T-1	
Power supply		kVA	34	38
Floor space (L×W×H)		mm	2,272×3,235×2,944	2,710×3,330×3,219
Machine weight		kgf	7,000	11,000
CNC system			Fanuc Oi-MD, 31i-B, 31i-B5	

※Design and specifications subject to change without notice.

Standard Accessories

- Full splash guard

- Coolant system (1.8kW)

- Leveling parts (Level plate, bolt, etc.)

- Standard tools and tool box

- Lubrication system

- Work light
- 3 step patrol lamp

- Rigid tapping

- Spindle override

- Spindle tachometer

- Door inter lock

- MPG handle
- Manual and parts list

- 10.4" LCD OP Screen

Optional Accessories

- Air gun

- Air blow

- Coolant gun

- Rotary table

- Oil skimmer

- Coolant level gauge
- Through spindle coolant (TSC 20Bar)

- MPG handle(3ea)

- Air conditioner for electric cabinet

- Tool measuring system

- Lift-up chip conveyor (HINGE TYPE / SCRAPPER TYPE)

NC Specifications / FANUC Oi-MF

Item		Specification	F Oi-MF	F 31i
Controlled axis	Controlled axes		XYZ(A,B)	XYZ(A,B)
	Max. controlled axes		4(6) AXIS	4(6) AXIS
	Max. simultaneously controlled axes		4	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	○	○
Feed function	Reference position return check	G27	○	○
	Rapid traverse feedrate override	F0, 25%, 50%, 100%	○	○
	Feedrate override		0~200%	0~200%
Spindle function	Spindle override		○	○
	Rigid tapping		○	○
Tool functions	Tool function	T4-Digt / T2-Digt	T2-Digt	T2-Digt
	Tool nose radius compensation	G40 ~ G42	○	○
	Tool offset pairs		400	400
	Tool geometry / wear offset	GEOMETRY & WEAR DATA	○	○
	Tool life management		○	○
	Tool path graphic display		○	○
Program input	Automatic tool compensation		○	○
	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	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	10.4" color
Data input/output	Memory card input / output		○	○
	USB memory input / output		○	31i-A(x), 31i-B(O)
Editing operation	Part program storage size	512Kbyte, 256Kbyte	512Kbyte	256Kbyte
Manual guide i	Manual Guide I		Opt.	Opt.