NC Specification (Mitsubishi M70VA)

Item		Specification
Controlled axis	Simultaneously controlled axes	3 axes (X/Y/Z)
	Least input increment	0.001mm (0.000039")
	Absolute	
	Inch / metric conversion	G20, G21
Interpolation	Positioning	G00
	Linear Interpolation	G01
	Circular Interpolation	G02, G03
Feed function	Dwel	G04
	Handle traverse override	0.001/0.01/0.1mm (0.000039"/0.000039"/0.000039)
	Travel overrride	F0, 25, 50, 100%
	Feed override	0-200% (10% unit)
	Jog override	0-6000mm/min (196.9ipm) (20steps)
	Automatic deceleration	Rapid travel : linear
		Cutting feed : exponential Soft over treavel
Program / Editing	Program storage length	M70 : 600m M700 : 1280m
	Number of stored programs	M70 : 400 M700 : 1000EA
	Program editing	Del, Ins, Alt, Protect
	Program number search	Program Name
	Sequence number search	N4 Digits
	Program data input	G10
	Background editing	
	Manual data input / rigid tapping	
Screen display	Operation panel	8.4" Color LCD
	Language	English / Korean / Chinese / EU
Interface	Data input/output interface	RS-232C
	Taper code	CF CARD
STM function	Spindle speed function	S5 digit
	Tool	T2 digit
	M,B function	M2, B2 digit
Tool function	Tool length compensation	
	Tool diameter compensation	
	Number of tool compensations	400
Coordinate system	Automatic origin return	G28
	Origin return confirmation	G27
	Automatic work coordiates	
	Work coordinate system	G53(machine), G54-G59
Program aux. functions	Auxiliary function	M
	Drilling canned cycle	
	Mirror image	
	Program restart	

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SMEC
Smart One, Global One
www.esmec.com

SMEC

SM 400

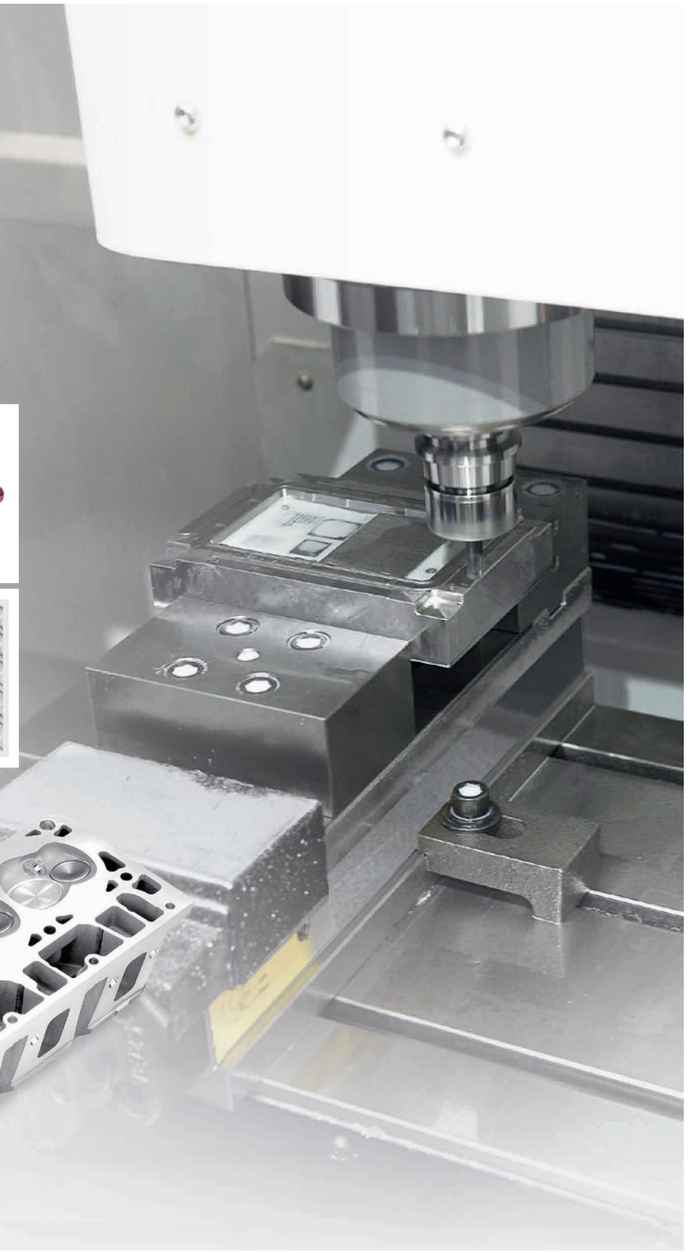
TAPPING CENTER

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

Samsung
Machine Tools
Engineering
Company



Great Productivity, Vertical Tapping Center

Ideal for mass production of automotive parts, IT parts and mold machining.

Newest champion in vertical tapping centers

Futuristic vertical machining center with advanced technology in a compact design

Spindle

Fanuc	Fanuc	SIEMENS
Spindle Speed 12,000 rpm	Spindle Speed 20,000 rpm	Spindle Speed 24,000 rpm
Spindle Motor 3.7/5.5 kW	Spindle Motor 2.2/3.7 kW	Spindle Motor 3.7/13 kW
Spindle Torque 6.9/11.8 N.m	Spindle Torque 6.9/11.8 N.m	Spindle Torque 14.1/35 N.m
Mitsubishi	**Mitsubishi**	**Mitsubishi**
Spindle Speed 12,000 rpm	Spindle Speed 20,000 rpm	Spindle Speed 24,000 rpm
Spindle Motor 3.7/5.5 kW	Spindle Motor 3.7/5.5 kW	Spindle Motor 2.2/3.7 kW
Spindle Torque 14.1/35 N.m	Spindle Torque 14.1/35 N.m	Spindle Torque 14.1/35 N.m

Capable of supporting a variety of machining operations with its 20,000 rpm Direct Motor and optimized bearing pre-loaded settings that increase rigidity, counter temperature increase during operation and extend bearing life.

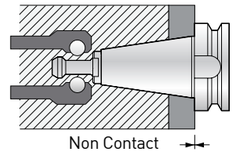
Spindle Taper

2-face tool locking system offered (STD)

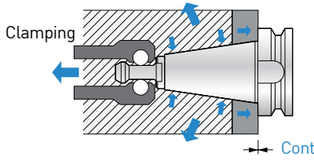
The dual contact against the spindle surface and taper surface reduces vibration while enabling high precision, high speed machining.

The increased diameter enhanced the rigidity and ATC repeatability while improving tool life by preventing Z-axis displacement during high speed machining.

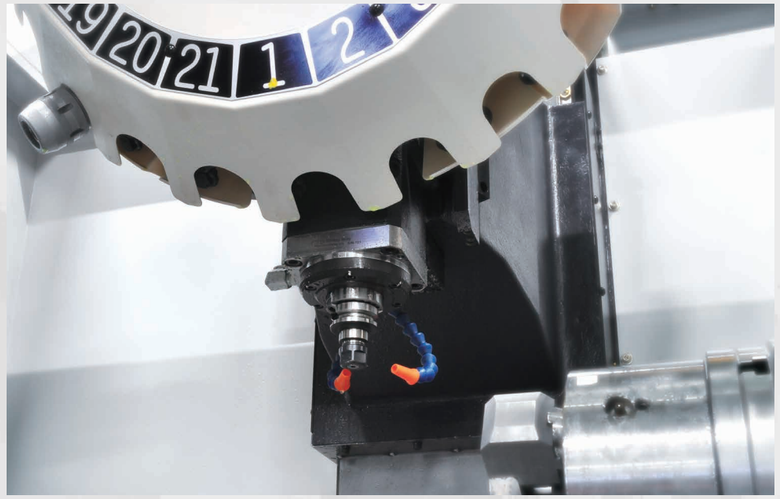
Before Clamping



After Clamping

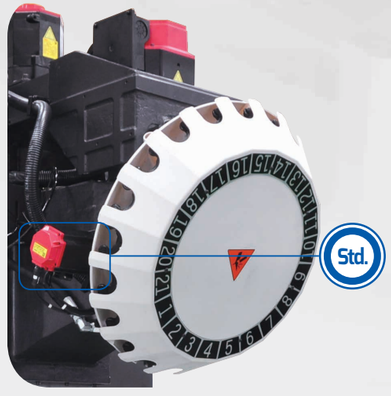


High-speed tool changer being driven by enhanced technologies



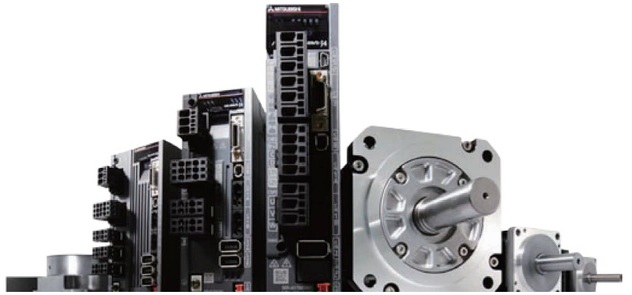
ATC & Magazine

The standard unit has a 16 tool turret-type magazine. While the twin-arm type offers fast tool changes of 1.4 second Tool to Tool and 2.3 second Chip to Chip, minimizing the amount of non-cutting time.



Servo Motor ATC

The high-speed/precision servo motor ATC is a "must have item" to maximize productivity.



the most advanced mechanism of high-speed technology

Servo Motor

Travel precision was improved by directly connecting the ballscrew with high reliability servo motors for each axes.

Guide Way

The use of LM Guides with superb responsiveness increased rapid traverse speeds and reduced non-cutting time while minimizing noise during travel.
In particular, by minimizing Stick Slip and wear that occurs on normal slides, we can maintain precision over long machining periods.

Ball Screw

The ballscrews were anchored on both ends using 4 rows of Angular Thrust Bearings with pre-tension to prevent thermal expansion due to the increased temperature of the ballscrew during operation and backlash.
In addition, the ballscrews are directly coupled to the servo motor to enable precise axis travel.

Rapid Traverse

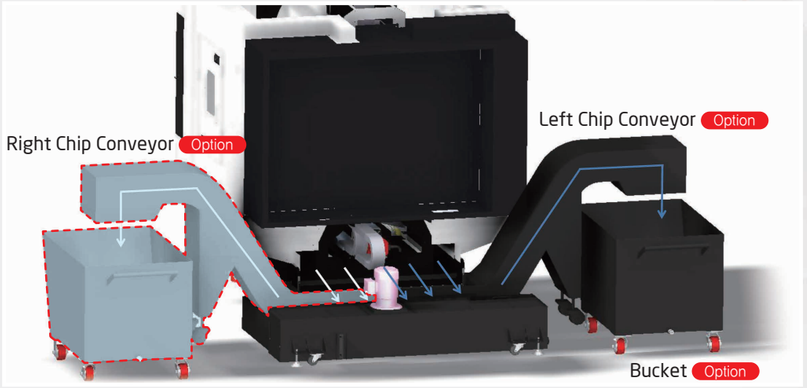
Offering best-in-class rapid traverse of 60m/min and 1G deceleration significantly reducing non-cutting time.

Optimized high-performance features

Table

The wide table work surface and completely enclosed slide way structure keeps chips and coolant out of the guideways.

Chip Conveyor



Centralized Utility Alcove

Operation status of lubrication, air supply, etc. can easily be checked.

X-Axis
530 mm
Y-Axis
400 mm
Z-Axis
350 mm

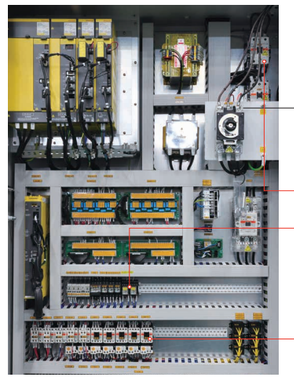
Centralized Operation Panel

- 8.4 inch color LCD
- Semipermanent LED Lamp
- Swivel operation panel for convenient operation and work access

Spindle Head Cooling System [20,000 / 24,000rpm]

Std.

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.
(12,000rpm : Opt.)



High reliability components used in the electric cabinet to reduce frequency of breakdown.

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

Automatic Lubrication Dispenser

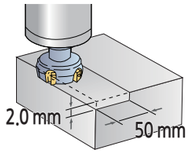
Automatic lubrication dispenser that reliably dispenses the required amount of lubrication to the required travel axes. Lubrication is only dispensed when the travel axes is in operation, reducing the amount of lubrication that is consumed.

SMEC Smart One, Global One

Cutting Capacity (BT30 3.7/5.5KW)

Face milling Carbon Steel (SM45C)

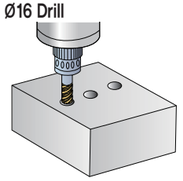
Ø63mm Face mill (5Z)



Cutting amount 112.5 ㎤/min
Spindle speed 1000 r/min
Feedrate 450 mm/min

Drilling Carbon Steel (SM45C)

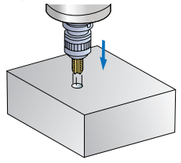
Ø16 Drill



Cutting amount 45 ㎤/min
Spindle speed 1200 r/min
Feedrate 225 mm/min

Tapping Carbon Steel (SM45C)

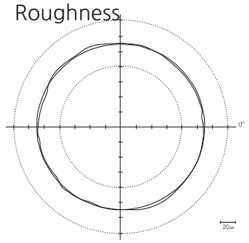
M16



Depth of cut 30 mm
Spindle speed 1500 r/min
Feedrate 3000 mm/min

High Precision

Roughness

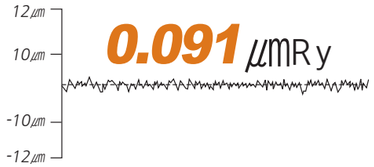


5.80㎛

Roundness

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

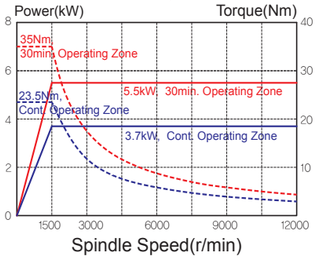
Surface Roughness <O.D. cutting>



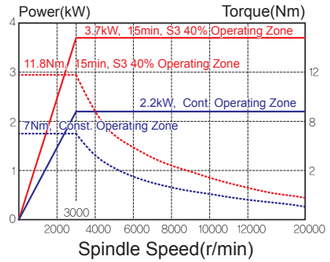
0.091 ㎛Ry

Spindle Power & Torque Diagram

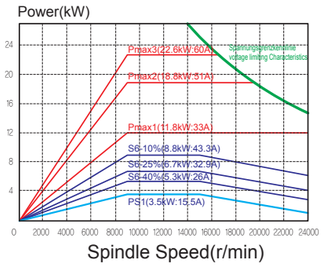
F-0i MD 12,000RPM



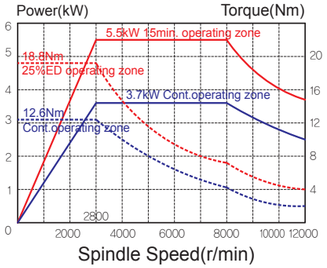
F-0i MD 20,000RPM



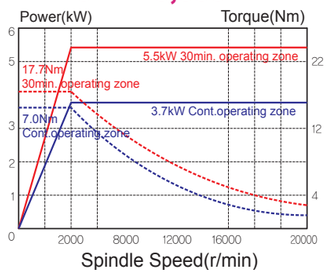
SIEMENS 24,000RPM



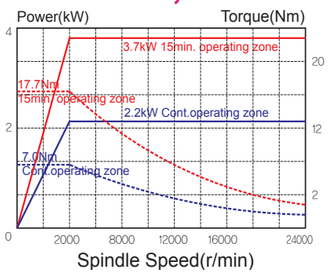
M70VA 12,000RPM



M70VA 20,000RPM



M70VA 24,000RPM



Machine Dimensions

Unit : mm

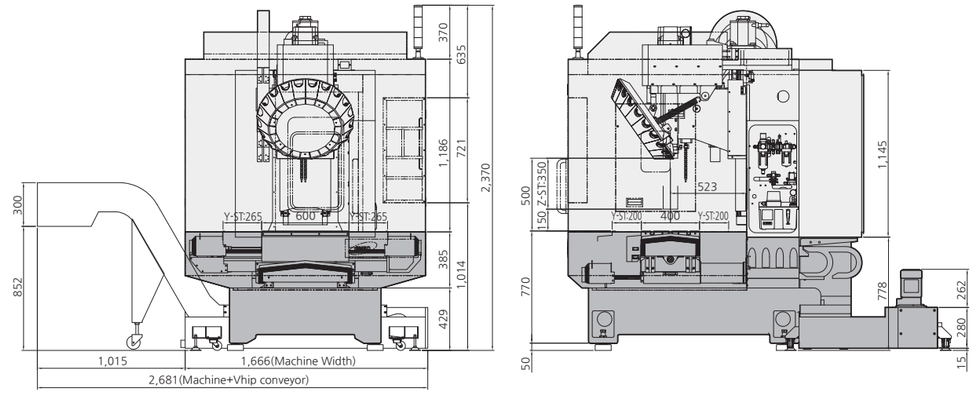
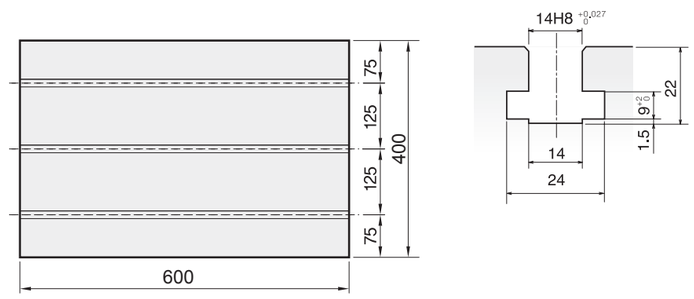


Table & T-Slot

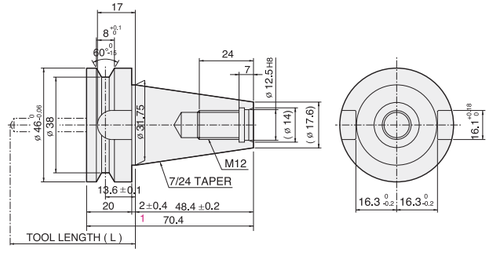
Unit : mm



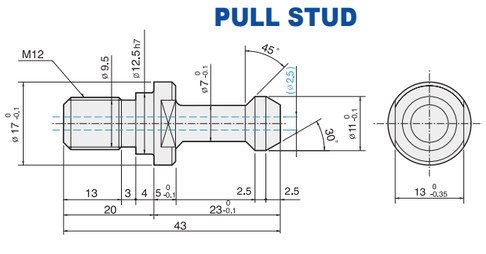
Tool Shank

Unit : mm

BBT 30



PULL STUD



SMEC Smart One, Global One

Major Specifications

DESCRIPTION			SM 400 (Fanuc)	SM 400 (Mitsubishi)	SM 400 (Siemens)
Travel	X axis	mm	530	530	530
	Y axis	mm	400	400	400
	Z axis	mm	350	350	350
	Distance from spindle center to column	mm	523	523	523
	Distance from spindle nose to table surface	mm	150~500	150~500	150~500
Table	Table surface	mm	14H8 × p125 × 3ea	14H8 × p125 × 3ea	14H8 × p125 × 3ea
	Loading capacity	kg	200	200	200
	Table size	mm	600 × 400	600 × 400	600 × 400
Spindle	Spindle speed	r/min	12,000 (20,000)	12,000 (20,000 / 24,000)	24,000
	Tool shank		ISO #30 7/24 TAPER	ISO #30 7/24 TAPER	ISO #30 7/24 TAPER
	Motor (Cont. /30min)	kW	3.7/5.5 (2.2/3.7)	3.7/5.5, 3.7/5.5, 2.2/3.7	3.7/13
	Torque (Cont. /30min)	N.m	6.9/11.8	14.1/35 (12.4/23.6)	14.1/35 (12.4/23.6)
Feedrate	Rapid traverse(X/Y/Z)	m/min	60 / 60 / 60	60 / 60 / 60	60 / 60 / 60
	Slide type	-	LM GUIDE	LM GUIDE	LM GUIDE
	Cutting feedrate(X/Y/Z)	mm/min	1~30,000	1~30,000	1~30,000
	Feedback system		Absolute	Absolute	Absolute
	Feed rate(X/Y/Z/B)	kW	3 / 3 / 3	2.2 / 2.2 / 2.2	3 / 3 / 3
ATC	Tool shank		BBT 30	BBT 30	BBT 30
	Magazine capacity		21	21	21
	Max. tool dia. [adjacent empty]	mm	Ø80[Ø60]	Ø80[Ø60]	Ø80[Ø60]
	Max. tool length	mm	150	150	150
	Max. tool weight	kgf	3	3	3
	Tool selection method	-	Fixed address	Fixed address	Fixed address
	Tool change method	-	Umbrella	Umbrella	Umbrella
	Tool changing time (T-T)	sec	1.4	1.4	1.4
	Chip-to-chip time	sec	2.3	2.3	2.3
Compressed air supply		Mpa	0.4~0.6	0.4~0.6	0.4~0.6
Power supply		kVA	30	30	30
Floor space (L×W×H)		mm	1,654 × 1,765 × 2,652	1,654 × 1,765 × 2,652	1,654 × 1,765 × 2,652
Machine weight		kgf	3,800	3,800	3,800
CNC system			Fanuc 0i-MD	Mitsubishi M70VA	SIEMENS

※Design and specifications are subject to change without notification. ( ) : Optional

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
- Door inter lock
- Bed flushing
- KCS specification
- MPG handle
- Manual and parts list

Optional Accessories

- Air gun
- Air blow
- Coolant gun
- Rotary table
- Oil skimmer
- Coolant level gauge
- Through spindle coolant (TSC 20Bar)
- Tool length measurement system (Automatic)
- Spindle oil cooler
- HYD unit
- Mist collector (Top cover must be installed)
- Top cover (Recommended when using TSC)
- Lift-up chip conveyor (HINGE TYPE / SCRAPPER TYPE)

NC Specifications (FANUC 0i-MD)

Item		Specification	F 0i-MD
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		8.4" color
Data input/output	Memory card input / output		○
	USB memory input / output		○
Editing operation	Part program storage size	512Kbyte(1280m)	1280M
Manual guide i	Manual Guide I		Opt.