

SMEC

MCV 4600/5500

LM GUIDE TYPE
VERTICAL MACHINING CENTER



WERKZEUGMASCHINEN

MCV 4600/5500

| MCV 4600
| MCV 5500

LM GUIDE TYPE VERTICAL MACHINING CENTER

MCV 4600/5500



Ease of use design with low center of gravity design

- minimized gap between the front cover and table edge for easy load/unload of materials
- high rigidity single-piece bed with low center of gravity design
- LM guides with minimal overhang
- high rigidity and high precision with high rigidity saddle and single-piece column design
- maximized space efficiency with the compact design

Category	MCV 4600	MCV 5500
Travel (X/Y/Z)	mm(inch) 900/460/520(35.44/18.12/20.48)	1,050/550/520(41.34/21.66/20.48)
Table size	mm(inch) 1,050x460(41.34x18.12)	1,200x540(47.25x21.26)
Table loading capacity	kgf(lb) 600(1,322.78)	800(1,763.70)
Table surface	mm(inch) 18H8(0.71H8) T-slotx125(4.93)x3ea	18H8(0.71H8) T-slotx125(4.93)x4ea
Max. spindle speed	rpm 12,000	12,000
Tool-to-tool time	sec 1.3(60Hz), 1.6(50Hz)	1.3(60Hz), 1.6(50Hz)
Rapid traverse (X/Y/Z)	m/min(ipm) 36/36/30(1,417.33/1,417.33/1,181.11)	36/36/30(1,417.33/1,417.33/1,181.11)
Tool storage capacity	EA 30	30

High productivity

The use of roller type LM guide ways with excellent responsiveness minimizes the amount of noise generated during travels and greatly shortens non-cutting times.

High performance, high precision machining

The machine design ensures stable machining while the direct-drive spindle minimizes vibrations and thermal growth, ensuring high precision machining.

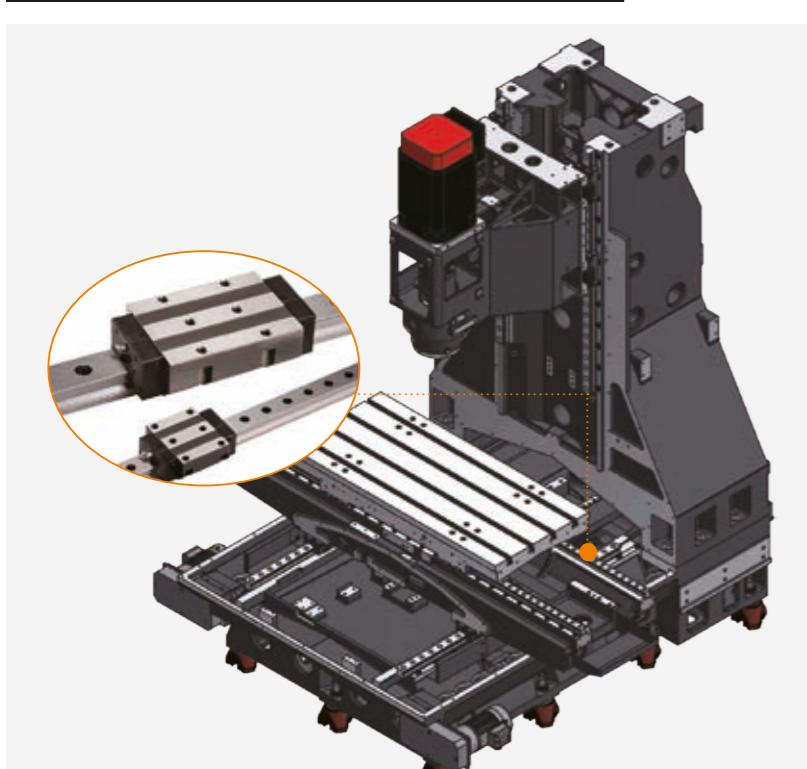
Easy Accessibility

The low center of gravity design and minimized gap between the front cover and table edge allows easy load/unload of materials with minimal operator effort and easier machine maintenance.

Operator Convenience

The high performance NC option (S4 package), standard operator-centric OP Panel (15" screen) and eco-friendly coolant system maximizes operator convenience.

■ High productivity



Roller type LM guide way

The use of roller type LM guide ways with excellent responsiveness minimizes the amount of noise generated during travels and greatly shortens non-cutting times.

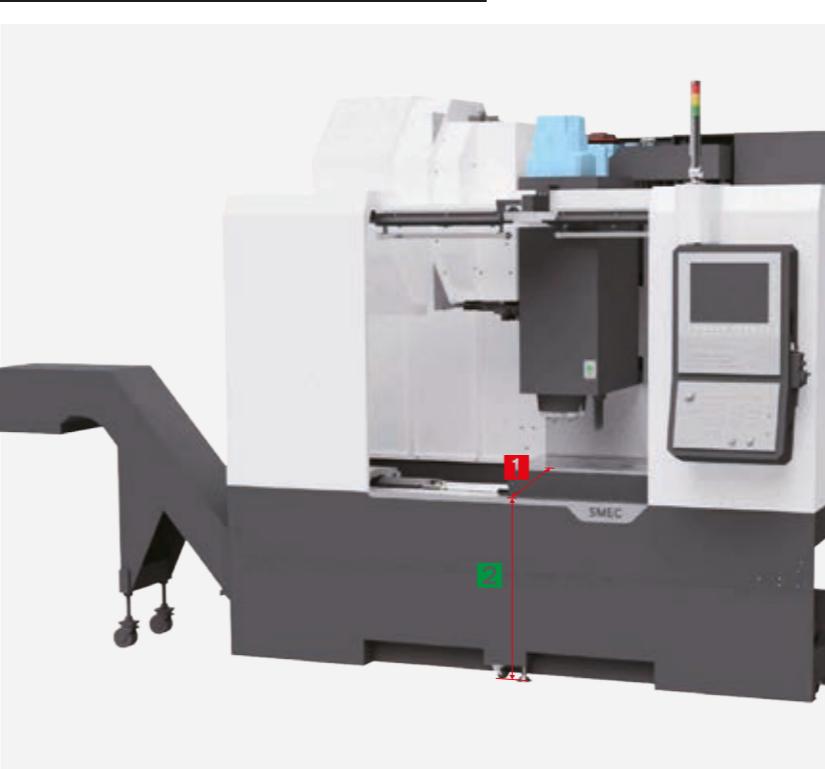
- Enhanced speed, rigidity and durability
- Compared to ball type LM guides, it significantly improves wear resistance, thus improving travel precision and durability

Rapid Traverse (X/Y/Z-axis)

36/36/30 m/min

(1,417.33/1,417.33/1,181.11 ipm)

■ Superior Accessibility



- With the door opened, a hoist can be brought in past the center point of the table, making it very easy to move heavy materials into the machine

- The distance between the cover and the table was minimized for easy loading/unloading of materials and to allow access to the entire table surface

1 Distance between front door and table

MCV 4600 : 250 mm (9.85 inch)

MCV 5500 : 270 mm (10.63 inch)

2 Distance from floor to table top

MCV 4600 : 885 mm (34.85 inch)

MCV 5500 :

920 mm (36.23 inch)
(REAR-TYPE COOLANT TANK)

1,000 mm (39.38 inch)
(SIDE-TYPE COOLANT TANK)

■ High performance, high precision cutting capability



High quality precision with low center of gravity design

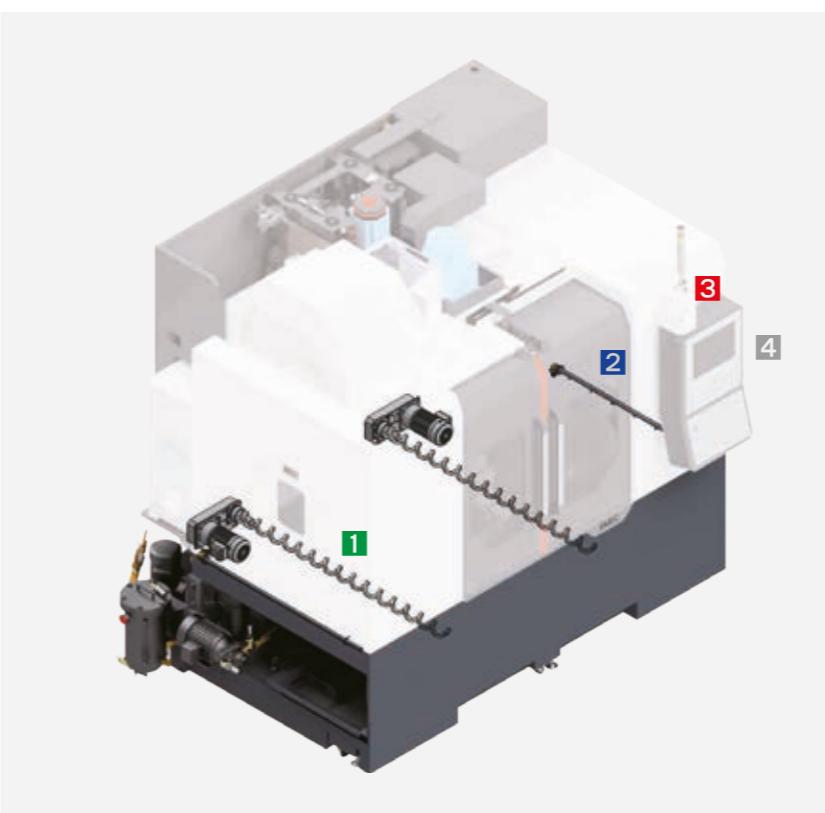
- High-rigidity single-piece bed designed with a low center of gravity box structure
- Overhang prevented through the adoption of the widest-in-class saddle for the roller type LM guideway
- High speed, high rigidity direct spindle

Servo Motor

Each axis ballscrew is directly connected with highly reliable digital servo motors enhancing traverse precision.

- Direct couplings used instead of intermediate mediums for power conversion
- Minimized backlash during axis feeds

■ Operator Convenience



1 Coil Conveyor

The 2 standard internal coil conveyors efficiently removes the chips that are created during machining

2 Bed Flushing

The standard bed flush system installed along the sides of the machine prevents chip build-up and ensures effective chip removal

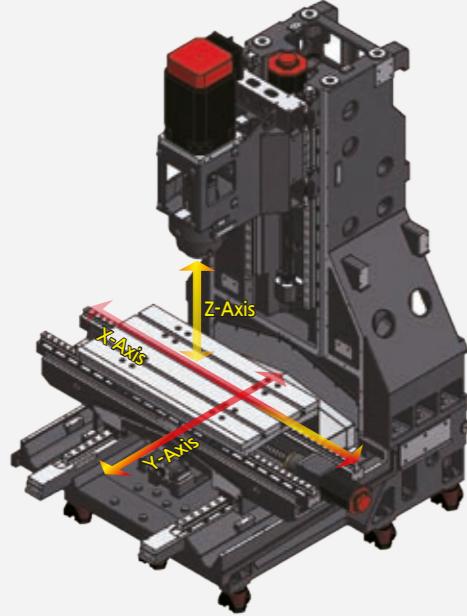
3 Operator-centric OP Panel

The swivel-type OP Panel is easy to work with and the QWERTY keyboard and high visibility buttons and efficient arrangement improves operator convenience

4 Machining Performance Enhancing High Performance NC Options Made Standard

The large 15" LCD display, data server and various NC options are made standard to significantly improve machining performance

Machine Design



The application of Roller Type LM Guides to X and Y axes minimizes the noise created during travel and the superior accel/decel minimizes the non-cutting time

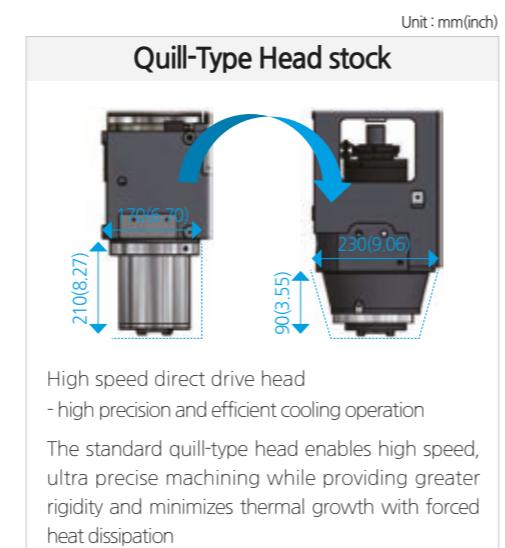
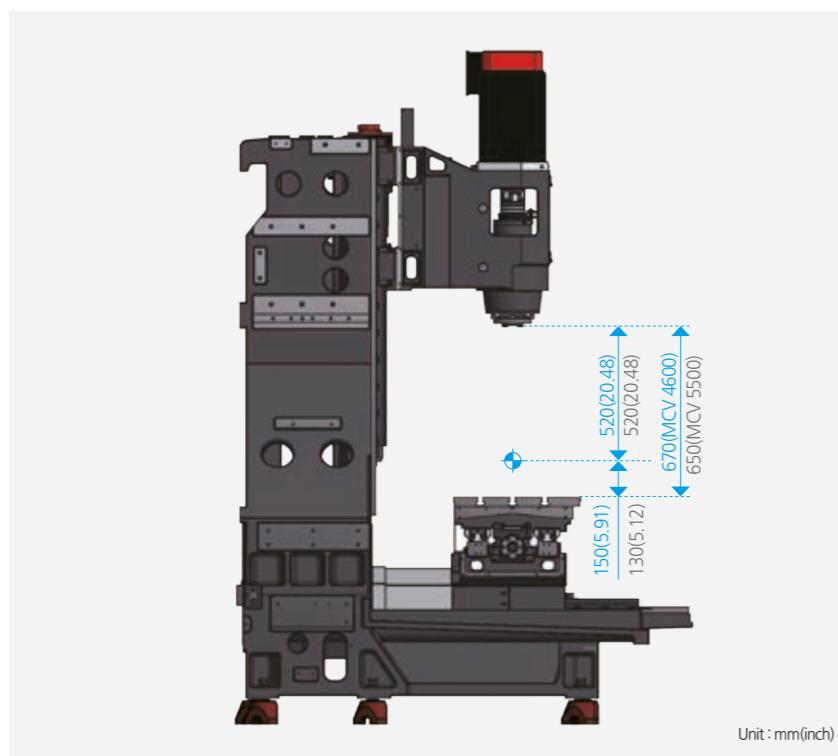
Highly Rigid Saddle with no X-axis Overhang

The longest-in-class 1,050mm X-axis stroke (MCV 5500) and the highly rigid saddle enables reliable machining of various materials and is suitable for long materials

Z-axis High Rigidity Arched Column

The arched column ensures high rigidity and high precision machining performance

Model	Travel [mm(inch)]		
	X-axis	Y-axis	Z-axis
MCV 4600	900(35.44)	460(18.12)	520(20.48)
MCV 5500	1,050(41.34)	550(21.66)	520(20.48)



Spindle to table-top distance

MCV 4600: 150~670mm (5.91~26.38 inch)

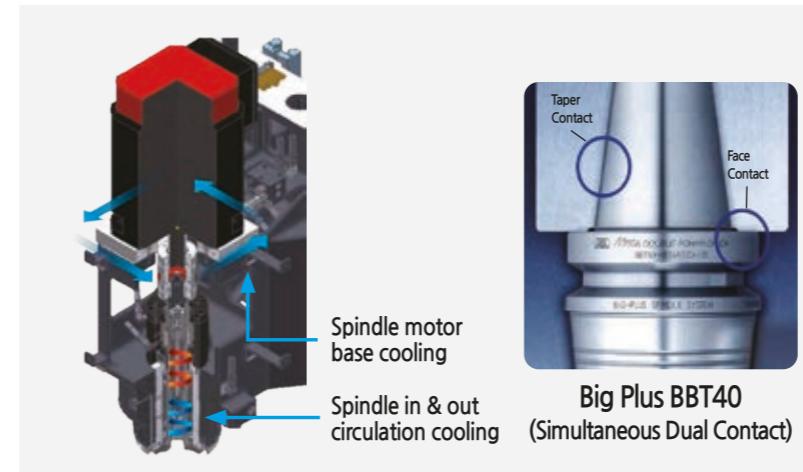
MCV 5500: 130~650mm (5.12~25.60 inch)

Spindle



High Efficiency Spindle Cooling System [STD]

For long-term high speed continuous operation, an oil cooler may be installed to circulate chilled oil around the spindle bearings to prevent thermal growth in the spindle and allow high precision machining



The ultra precision spindle is supported by 4 rows of P4 class high-speed angular bearings allowing high speed, high precision machining with the direct-coupled head that minimizes thermal growth through forced heat dissipation.

Max spindle speed
12,000 rpm

Power (Cont/Max)
11/22.2 kW
(14.76/29.78 Hp)

Torque (Cont/Max)
70/141.4 N·m
(51.63/104.30 lbs·ft)

JACKET Circulation Cooling

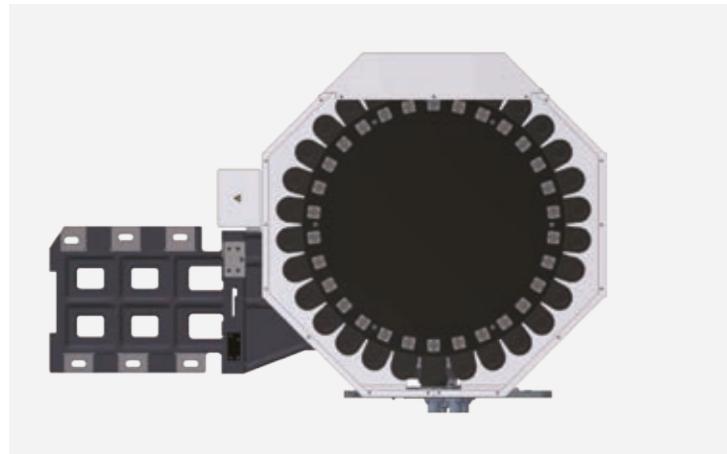
Semi-permanent grease lubrication applied to the bearings, while thermal growth is minimized using jacket circulation cooling around the bearing housing (a source of heat) via a Fan Cooler, ensuring stable performance and extending the lifetime of the spindle.

Standardized Dual-Contact Spindle

The dual-contact system that provides taper and flange contact when tool holders are clamped into the spindle

- with both the taper and flange in contact, improved stability with reduced vibration
- improved machining capability and surface finish under extreme conditions
- 100% compatible with current tools.(BT40)

ATC / Magazine



ATC Magazine

Designed with a standard 30 tool magazine with short travel distance to enable quick tool changes

Fast and errorless tool changes are made possible using the memory random technique and double arm type tool changer, minimizing non-cutting time

Tool storage capacity : **30ea**

Tool-to-tool time : **1.3sec**

Max. tool dia. [adjacent empty] :
80[125]mm (3.15[4.93]inch)

Max. tool length : **300mm** (11.82 inch)

Max. tool weight : **8kg** (17.64 lb)



Table

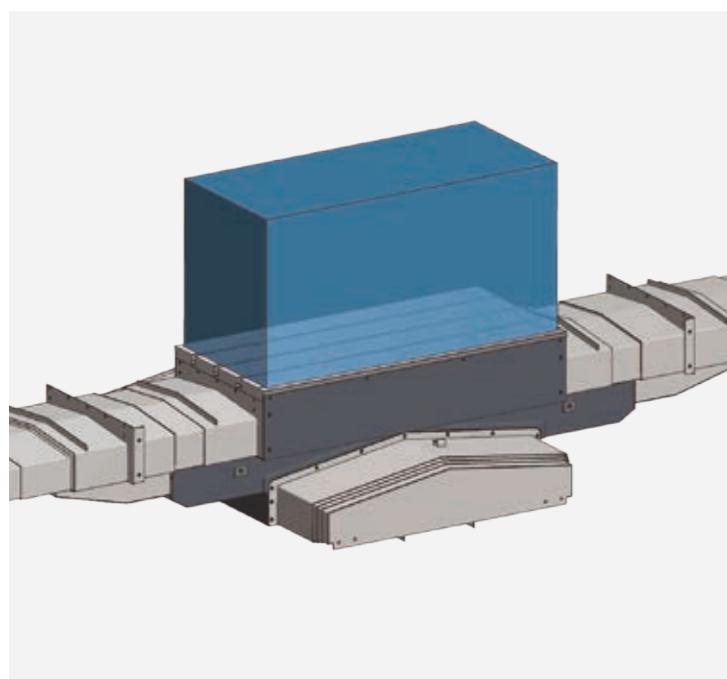


Table size and Table loading capacity were increased to support larger work area

Table size :

MCV 4600 : **1,050×460mm**
(41.34×18.12 inch)

MCV 5500 : **1,200×540mm**
(47.25×21.26 inch)

Table surface :

MCV 4600 : **18H8×p125×3ea**
(0.71H8xp4.93x3ea)

MCV 5500 : **18H8×p125×4ea**
(0.71H8xp4.93x4ea)

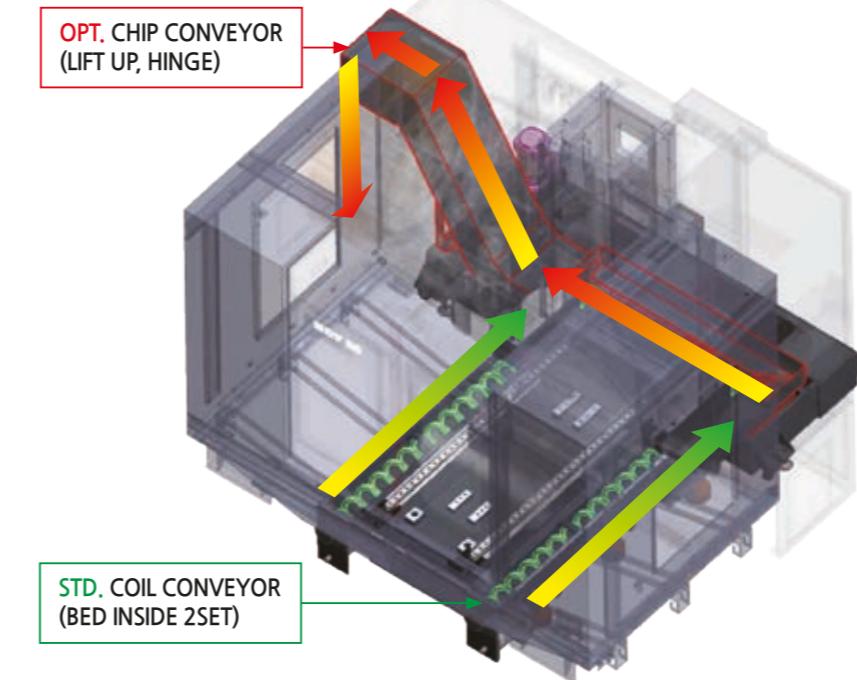
Table loading capacity :

MCV 4600 : **600kgf** (1,322.78 lbs)

MCV 5500 : **800kgf** (1,763.70 lbs)

Eco-Friendly Chip Disposal

MCV 5500



Complete chip discharge through the series of chip disposal processes by the coolant nozzle, bed flush, coil conveyor and chip conveyor

- the large, rectangular S/GUARD design and rear coolant tank ensures easy chip removal

- using bed flushing, complete chip disposal off the surface of the bed

MCV 4600 :

Side-type coolant tank

MCV 5500 :

Side-type and rear-type coolant tank available

Automated Coolant Supply

MCV 4600



Large capacity coolant tank located to the left-side of the machine enables easy coolant exchange, tank cleaning and pump maintenance

- OPT. Chip Conveyor
- OPT. Oil Skimmer(Belt)
- STD. Coolant Pump
- OPT. Coolant Pump
- OPT. T.S.Coolant Unit
- OPT. Coolant Level Switch

Coolant tank capacity :

MCV 4600 : **325l** (85.86 gal)

MCV 5500 : **365l** (96.43 gal)

Options

Rotary table and air/hyd fixture preparation

Components necessary for the installation of rotary table and fixtures may be added during assembly wherein hydraulic or pneumatic preparation may be selected.



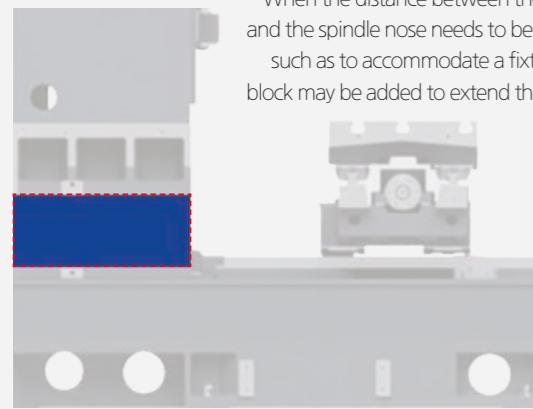
Tool measurement probe

Various automated tool diameter, length and lifetime measuring devices may be installed.



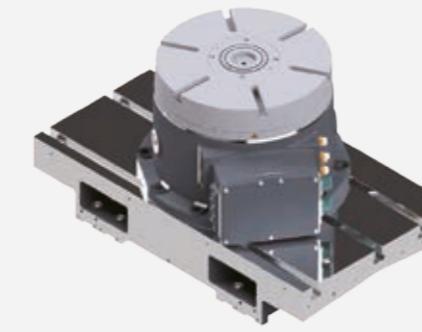
High column

When the distance between the table top and the spindle nose needs to be extended, such as to accommodate a fixture, a riser block may be added to extend the distance.



NC rotary table

When using an NC rotary table, multi-axis machining of diverse shapes is possible.



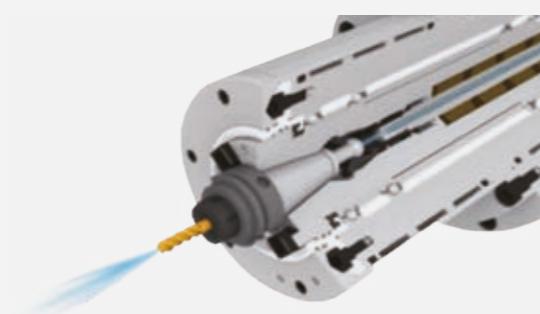
Chip conveyor

Equipment meant to remove chips created during machining



Through spindle cooling (TSC)

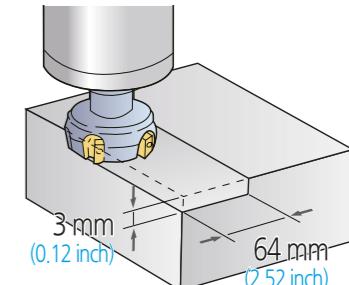
The TSC option may be added to improve machining effectiveness



Cutting performance

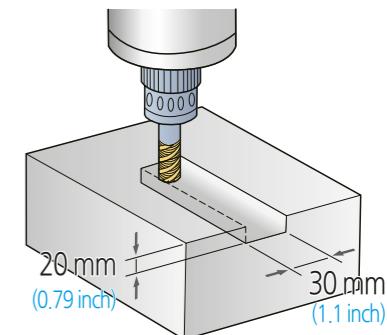
Face mill [$\varnothing 80\text{mm} (\varnothing 3.15")$] / Carbon steel (SM45C)

Chip removal rate [$\text{cm}^3/\text{min} (\text{inch}^3/\text{min})$]	Spindle speed (r/min)	Feedrate [$\text{mm}/\text{min} (\text{ipm})$]
432(26.37)	1,500	2,700(106.30)



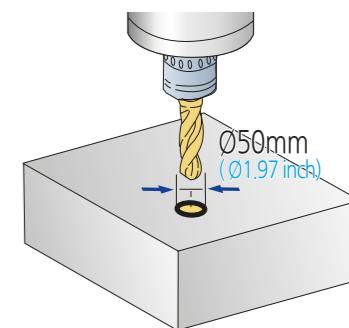
End mill [$\varnothing 30\text{mm} (\varnothing 1.18")$] / Carbon steel (SM45C)

Chip removal rate [$\text{cm}^3/\text{min} (\text{inch}^3/\text{min})$]	Spindle speed (r/min)	Feedrate [$\text{mm}/\text{min} (\text{ipm})$]
64.2(3.92)	223	107(4.22)



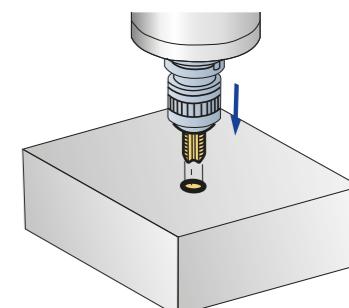
U-Drill [$\varnothing 50\text{mm} (\varnothing 1.97")$] / Carbon steel (SM45C)

Chip removal rate [$\text{cm}^3/\text{min} (\text{inch}^3/\text{min})$]	Spindle speed (r/min)	Feedrate [$\text{mm}/\text{min} (\text{ipm})$]
353(21.55)	1,500	180(7.09)



Tap / Carbon steel (SM45C)

Chip removal rate [$\text{cm}^3/\text{min} (\text{inch}^3/\text{min})$]	Spindle speed (r/min)	Tap size (mm)
547(33.38)	318	M27



TEST conditions : MCV 5500 - 12,000rpm [BT40]

* The above data is based on internal testing. Values may change depending on cutting conditions.

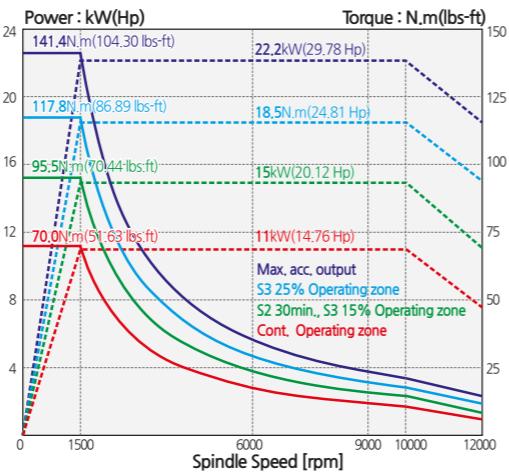
Spindle Power & Torque Diagram

MCV 4600/5500

Max Spindle Speed
12,000 rpm

Power (Cont/Max)
11/22.2 kW
(14.76/29.78 Hp)

Torque (Cont/Max)
70/141.4N·m
(51.63/104.30 lbs·ft)

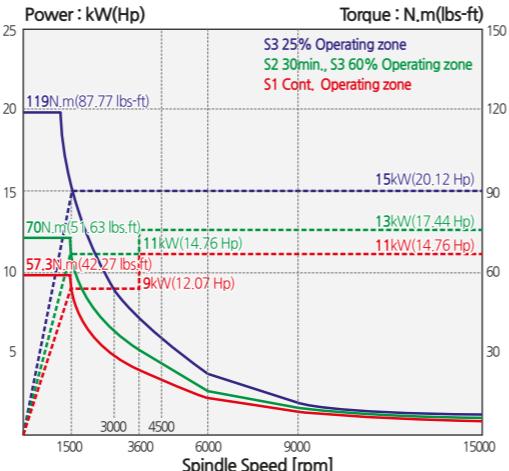


MCV 4600 (Optional)

Max Spindle Speed
15,000 rpm

Power (Cont/Max)
11/15kW
(14.76/20.12 Hp)

Torque (Cont/Max)
57.3/119N·m
(42.27/87.77 lbs·ft)



MCV 5500 (Optional)

Max Spindle Speed
8,000 rpm

Power (Cont/Max)
9/18kW
(14.76/20.12 HP)

Torque (Cont/Max)
141.6/229.2 N·m
(84.53/169.05 lbs·ft)

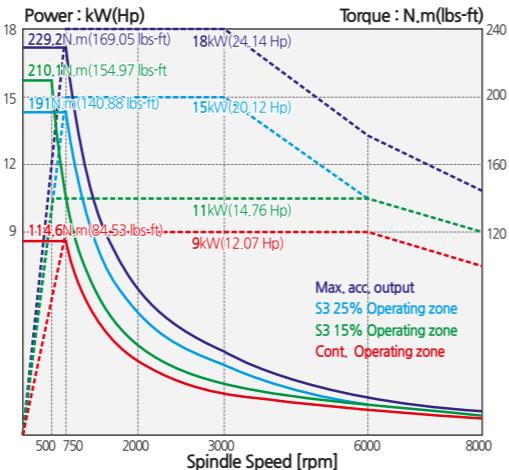


Table & T-Slot

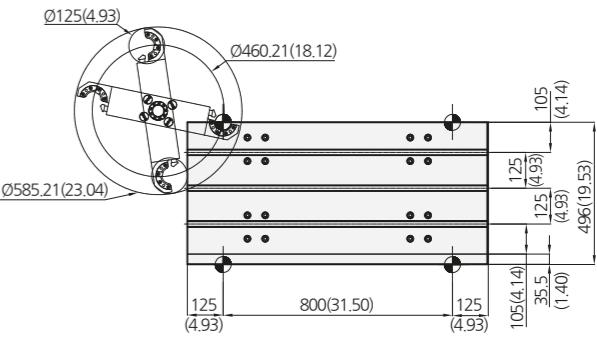
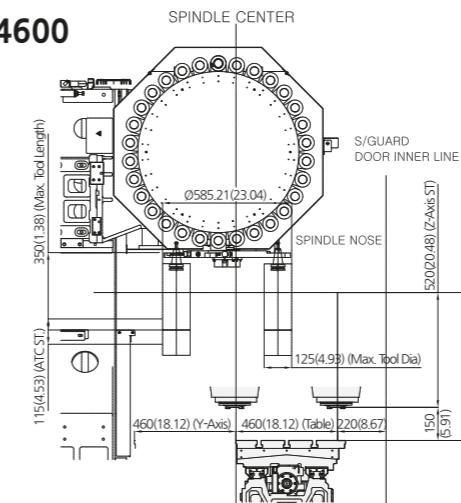
MCV 4600/5500



Unit : mm(inch)

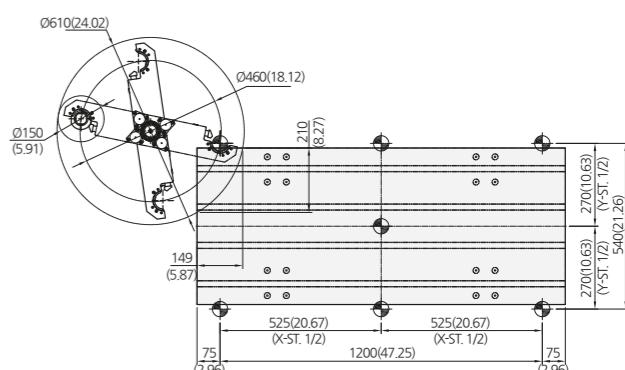
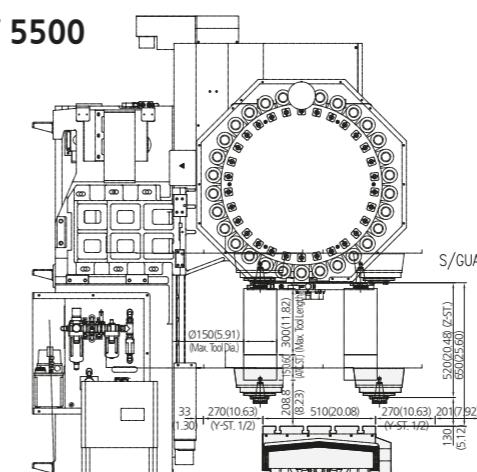
ATC Interference

MCV 4600

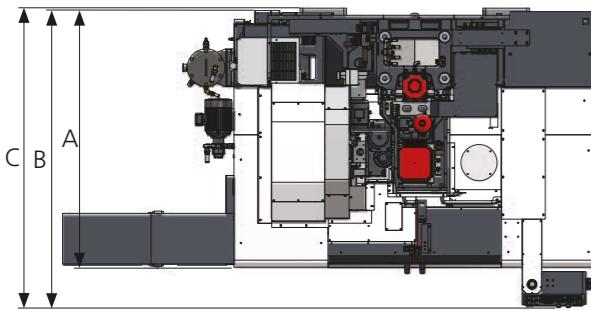
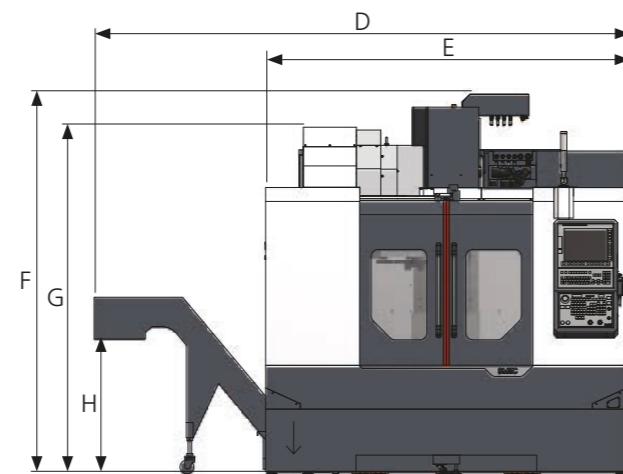


Unit : mm(inch)

MCV 5500

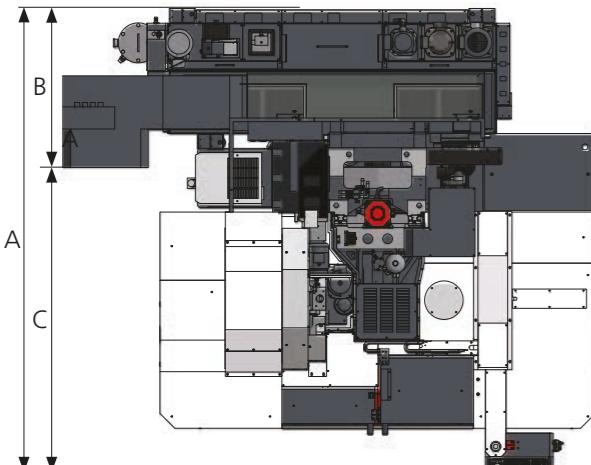
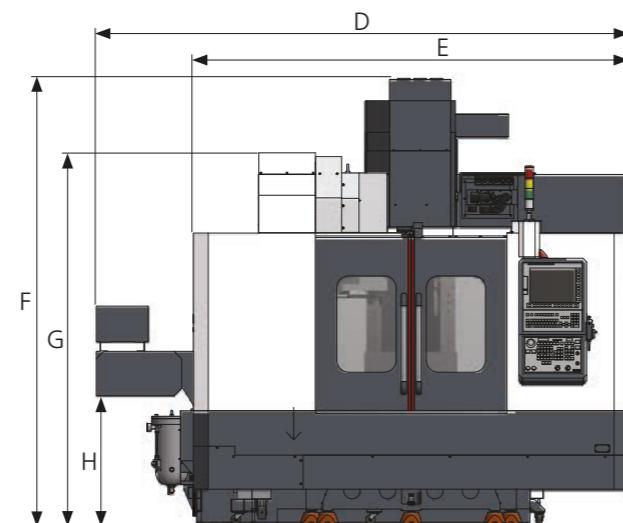


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Machine Dimensions**Top view****Front view**

Unit : mm (inch)

Model	A (Length)	B	C	D (Width)	E	F (Height)	G	H
MCV 4600	1,978 (77.88)	2,368 (93.23)	2,249 (88.55)	3,832 (150.87)	2,600 (102.37)	2,731 (107.52)	2,493 (98.15)	970 (38.19)

Top view**Front view**

Model	A (Length)	B	C	D (Width)	E	F (Height)	G	H
MCV 5500	3,126 (123.08)	1,075 (42.33)	2,052 (80.79)	3,596 (141.58)	2,940 (115.75)	3,019 (118.86)	2,516 (99.06)	876 (34.49)

Standard / Optional

● : Standard ○ : Optional X : N/A

Category**MCV 4600****MCV 5500****Spindle**

RPM	12R	●	●
	15R	○	○

Spindle chiller

	●	●
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ATC

Tool type	BBT40	●	●
	CAT40	○	○
	HSK-A63	X	X

Pull Stud

	45°	●	●
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Table & Column

T-slot table	200mm	●	●
	300mm	○	○
	400mm	X	X

Coolant Equipment

FULL SPLASH GUARD	●	●
Shower coolant	○	○
Coolant gun	○	○
Bed flushing	○	○
Air gun	○	○
Air blow	○	○
Tool measurement air blow (with tool measuring device)	○	○

Internal screw conveyor

Left	○	○
Right	○	○
Rear	X	X

Chip conveyor, SCRAPER

Left	○	○
Right	○	○
Rear	X	X

Chip bucket

STD (380l)	○	○
Rotating (200l)	○	○

Electrical Equipment

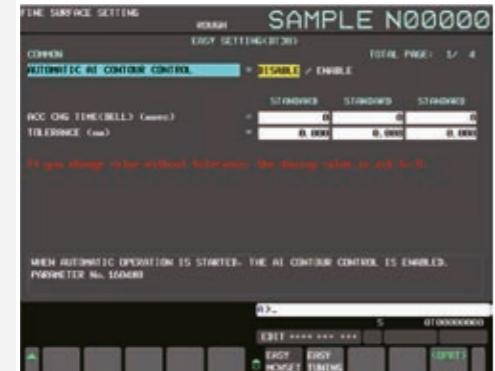
3 step patrol lamp & buzzer	●	●
Elec. cabinet light	○	○
Remote MPG	○	○
3-axis MPG	●	●
Work counter	GUI	●
Total counter	GUI	●
Tool counter	GUI	●
Multi counter	GUI	●
Residual current breaker	○	○
AVR (Auto Voltage Regulator)	○	○

※ For detailed information, please contact your local SMEC dealer.

Machining Solution (STD)

S4(sMec SMOOTH SURFACE SYSTEM) Package

High performance NC options to improve machining performance provided as standard



Without S4 Package

With S4 Package

15 inch LCD monitor standard	
AICC II (AI Contour Control II)	Efficient accel/deceleration (200 block look ahead)
Jerk control	Speed control during acceleration changes
Smooth tolerance plus control	Stable curved shape forming
Machining conditions selection function	Adjust accuracy level according to machining conditions
Machining quality selection function	
Manual Guide i	Visual machining check and setup guide
Data server	Transfer large program files
Part program storage	2MB (5,120M)
Number of registered programs	1,000ea

SMEC User Interface



Fanuc Oi MF Plus

- 15" LCD color display
- Part program size 2MB
- High quality designed OP Panel
- SMEC Custom SW
- Portable M.P.G

SMEC Custom S/W displayed using MDI's button or OP Panel's button

◀ CUSTOM : Provide operator convenience and improve productivity using the support function for tool management and additional device setting.

SMEC HMI



M/G-Code check function

Allows the operator to directly read the M/G-Code on the machine for easy application programming



PMC alarm check function

When a PMC alarm occurs, the cause and countermeasures are described in detail, making operation and maintenance more convenient



ATC Magazine status check, setting and maintenance function



Work coordinates, tool setting support function

Counter for each T-Code

IoT Solution (OPT)



NC-Gate / IoT-Gate

The NC-Gate / IoT-Gate that was developed in-house with our ICT technology is a universal gateway that not only interworks with our machine tools, but machine tools from other manufacturers, robots, automation equipment, and analog / digital sensors as a network device capable of bi-directional communication.

Supported drivers : Fanuc / Mitsubishi / Siemens NC, Modbus TCP, DeviceNet, Profibus, Ethernet, AI/DI/DO

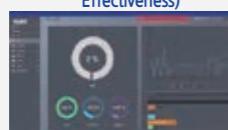
KPI (Key Performance Indexes)



Provides key performance indicators and displays target achievement

- Indicators : achievement rate, productivity, process defect rate, equipment usage, quality defect rate, lead time, and average cycle time

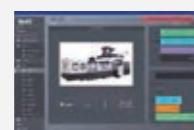
OEE (Overall Equipment Effectiveness)



Provides figures and graphs of overall equipment effectiveness

- Availability, performance, quality, etc.

Realtime Monitoring



Provides operation status and alarm information in case of problems in the production line

- Provides information about the operation status, speed, production alarms, etc. of each machine

Remote Control/ Management



Remote control and operation

- Emergency stop switch, program editing, etc.

Remote A/S



Problem diagnosis via remote control

- Provide remote diagnosis services to users via the IoT solution



Machine Specifications

Category		MCV 4600	MCV 5500
Travel	X-axis travel	mm(inch)	900(35.44)
	Y-axis travel	mm(inch)	460(18.12)
	Z-axis travel	mm(inch)	520(20.48)
	Spindle to table surface	mm(inch)	150~670(5.91~26.38)
Table	Table size	mm(inch)	1,050 × 460(41.34 × 18.12)
	Table loading capacity	kgf(lb)	600(1,322.78)
	Table surface	mm(inch)	18H8(0.71H8) T-slot × p125(4.93) × 3ea
Spindle	Spindle speed	rpm	12,000
	Power (Cont/Max)	kW(hp)	11 / 22.2(14.76/29.78)
	Torque (Cont/Max)	N.m(lbs.ft)	70.1 / 141.4(51.63/104.30)
Feedrate	X-axis rapid traverse rate	m/min(ipm)	36(1,417.33)
	Y-axis rapid traverse rate	m/min(ipm)	36(1,417.33)
	Z-axis rapid traverse rate	m/min(ipm)	30(1,181.11)
	Cutting feed(X/Y/Z)	mm/min(ipm)	1-15,000(0.04-570.56)
ATC	Tool shank	-	BBT40(CAT40)
	Pull stud	-	MAS P40T-1
	Tool storage capacity	ea	30
	Max tool diameter [adjacent empty]	mm(inch)	80(3.15)[125(4.93)]
	Max tool length / weight	mm/kgf(inch/lb)	300/8(11.82/17.64)
	Tool-to-tool time	sec	1.3(60Hz), 1.6(50Hz)
	Tool changing method	-	Double Arm Swing
	Tool select type	-	Memory random
Machine	Size [with SIDE chip conveyor] L×W×H	mm(inch)	2,600[3,832] × 2,249 × 2,731 (102.37[150.87] × 88.55 × 107.52)
	Size [with REAR chip conveyor] L×W×H	mm(inch)	-
	Weight	kg(lb)	5,000(11,023.12)
Coolant tank capacity		Liter(gal)	325(85.86)
Electric power supply		kVA/V	30/220
Controller		FANUC 0i-MF Plus	

※ Design and specifications are subject to change without notice.

NC Specification / FANUC

Category		0i-MF Plus	Category	0i-MF Plus
Controlled axis	Controlled axes	X, Y, Z	Absolute / incremental command	G90/G91
	Max simultaneously controlled axes	4	Repeating canned cycle	X
	Least input increment	0.001mm / 0.0001"	Repeating canned cycle 2	X
	Built-in stroke limit	Soft overtravel 1, 2, 3	Canned cycles	X
	Machine lock	●	Drilling canned cycle	G73/74/76, G80~89
Operation function	Manual handle feed	X1, X10, X100	Decimal point input	●
	Dry run	●	Inch / metric conversion	G20 / G21
	Single block	●	Program restart	●
	Feed per minute	G94	Sub program call	●
	Feed per revolution	G95	Max programmable value	±99999.999mm/±9999.999"
	DNC operation	Ethernet, CF card	M function	3 digit
	Retraction for rigid tapping	●	Custom macro	●
Interpolation function	Linear interpolation	G01	Addition of custom macro common variables	#100~#199, #500~#999 (#98000~#98499)
	Circular interpolation	G02, G03	Programmable data input	G10
	Dwell	G04	Tape code	ISO / EIA
	Cylindrical interpolation	G70.1	Optional block skip	●
	Skip	G31	Workpiece coordinate system	G52 ~ G59
	Fine surface machining	●	Addition of workpiece coordinate system	48(300) pairs
	Smooth tolerance control	●	Interface function	
	Nano smoothing	●	Embedded ethernet	●
	Polar coordinate interpolation	X	Fast ethernet	100 Mbps
	Reference position (zero) return	G28		
Feed function	Reference position (zero) return check	G27	Setting and display	
	2nd, 3rd, 4th reference point return	G30	Rapid traverse override	F0, 25%, 50%, 100%
			Feedrate override	0~200%
			Jog override	0 ~ 5,000 mm/min
			AI look ahead	20 block
			AI contour control II	200 block
			Look ahead block expansion (F0i) (400 Block)	○
Spindle function	High-speed processing	X	High-speed processing	X
	Look ahead block expansion (F3i)	X	Look ahead block expansion (F3i)	X
	Jerk Control	●	Jerk Control	●
Tool function	Spindle orientation	●	Spindle orientation	●
	Rigid tapping	M29	Rigid tapping	M29
	Spindle override	50 ~ 150%	Spindle override	50 ~ 150%
Editing operation	Tool number command	T2-Digit Tool number	Tool number command	T2-Digit Tool number
	Tool nose radius compensation	G40 ~ G42	Tool nose radius compensation	G40 ~ G42
	Tool offset pairs	400 pairs	Tool offset pairs	400 pairs
	Tool geometry / wear offset	●	Tool geometry / wear offset	●
	Tool length offset	●	Tool length offset	●
	Tool life management	●	Tool life management	●
	Tool path graphic display	●	Tool path graphic display	●



Fanuc Manual Guide i

**Erstellen Sie Ihre Teileprogramme
in nur wenigen Schritten**

Reduzieren Sie den Zeitaufwand bei der Überführung Ihrer Zeichnungen in die Produktion:

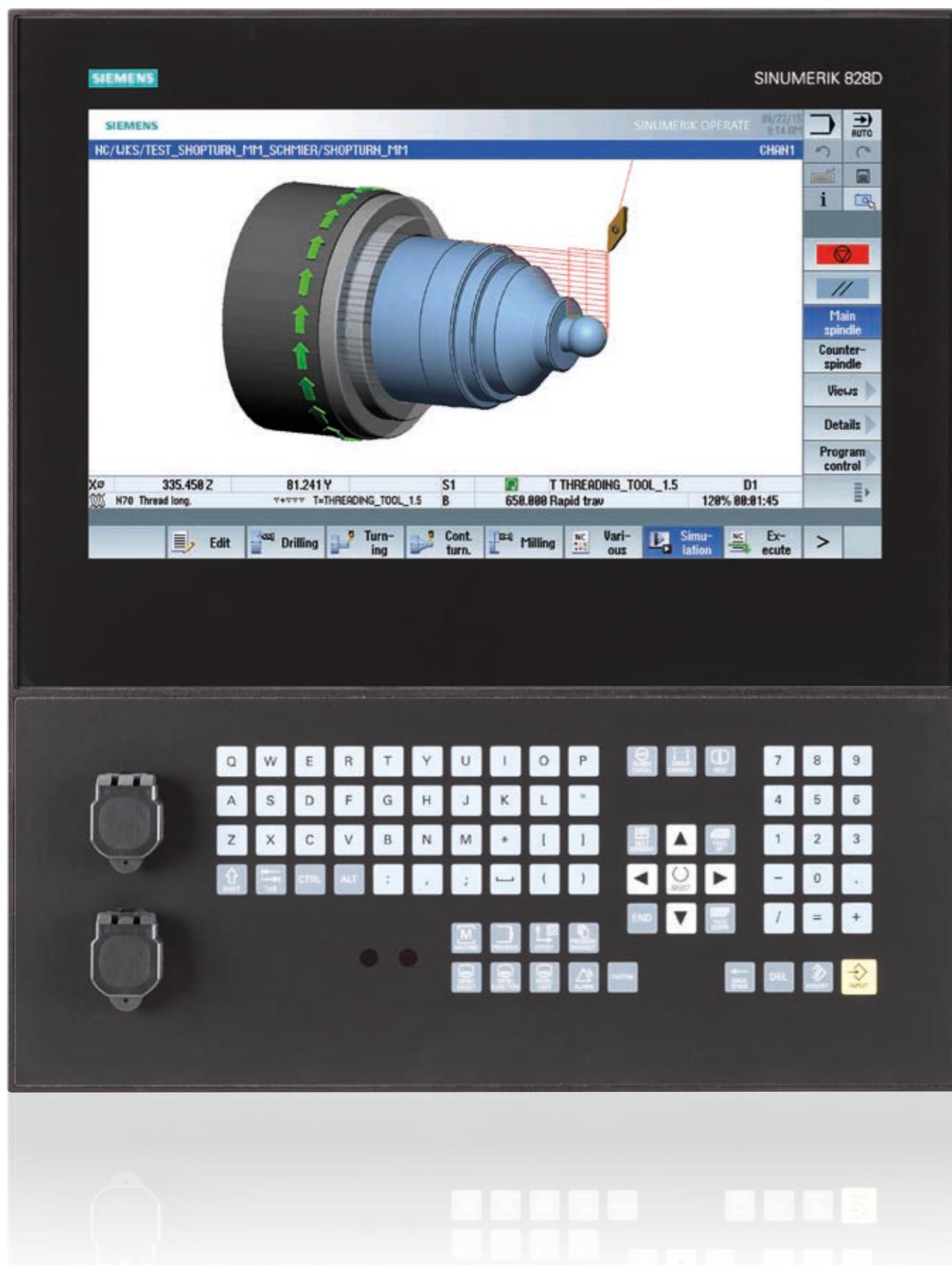
Mit dem FANUC MANUAL GUIDE i lassen sich sowohl einfache als auch hoch komplizierte Maschinenzyklen inklusive Dreh-, Fräsen-, Bohr- und Messzyklen schnell und einfach umsetzen. Dabei unterstützt die Software Sie durch intuitive interaktive Benutzerführung sowie spezielle Funktionen zur einfachen Teileprogrammierung und Simulation.

Merkmale:

- Bedienerfreundliche Programmierumgebung
- Erweiterte Zyklusbearbeitung (Drehen und Schleifen)
- Leistungsstarke Profilberechnung
- Nahtloser Umgebungswechsel
- Werkzeugverwaltungsfunktion
- Messzyklen
- Restschnitt
- Bearbeitungssimulationen

Die benutzerfreundliche Software MANUAL GUIDE i zur Fertigungsprogrammierung vereinfacht den Betrieb Ihrer Maschine. Die innovative Programmierung ermöglicht die Entwicklung von der Zeichnung zum Werkstück in kürzester Zeit. Dank MANUAL GUIDE i die CNC-Maschinen von FANUC schnell und einfach für Dreh-, Schleif- und Verbundbearbeitungsprozesse programmiert werden.

Selbsterklärende Menüs und grafische Simulationen führen den Benutzer durch die Programmierung, was selbst bei komplexen Bearbeitungsvorgängen zu hocheffizienten Ergebnissen führt.



Siemens Sinumerik 828D

Mehr Produktivität mit SINUMERIK 828D
– Smart Operation

Robuste MultiTouch-Bedienung
kombiniert mit SideScreen

Für Werkstatt, Lohnfertigung und Großserienfertigung sind hochproduktive Automatisierungslösungen gefragt, die den Weg in die Digitalisierung begleiten.

Ob Einzelteil- oder Massenfertigung, einfache oder komplexe Werkstücke – die SINUMERIK CNC-Lösungen bieten Werkzeugmaschinenbetreibern immer die passende Lösung für ihre Anforderungen.

Durch die tägliche Nutzung von mobilen Geräten wie Smartphones, Tablets oder Computern haben wir eine bestimmte Art der Interaktion mit Maschinen entwickelt. Werkzeugmaschinen bilden hier keine Ausnahme mehr.

- Der Trend zu größeren Bildschirmen eröffnet die Möglichkeit, zusätzliche anpassbare Fenster in das HMI einzubinden.
- Änderung des Bildseitenverhältnis von 4:3 in 16:9.
- Zugleich stehen Lösungen bereit, mit denen die Benutzeroberfläche individuell an die Anforderungen der Kunden angepasst werden kann.
- So kann der Maschinenbediener wesentlich mehr Informationen parallel betrachten.

Gleich einspeichern und
ANGEBOT sichern!

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