



Doosan Machine Tools

HIGH PRODUCTIVITY TWIN TABLE
VERTICAL MACHINING CENTER

VC

430 • 510



Basic information

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Performance

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VC 430 / VC 510

The VC430/VC510 twin table vertical machining center provides features to optimize high precision during long periods of operation. These machines are based on a moving column structure, and by utilizing the rapid workpiece change by rotating pallet and high powered spindle, productivity is maximized.

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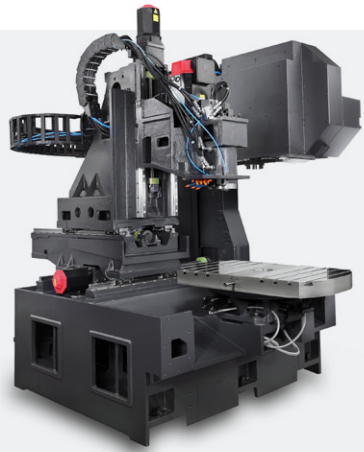
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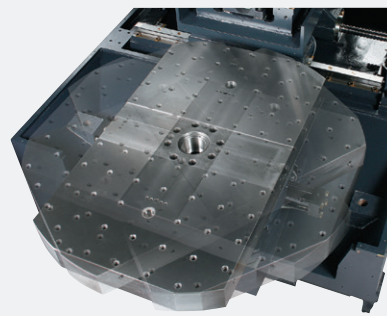
High-rigidity and Column-moving Structure

High-rigidity cast structure is excellent for vibration absorption and minimizes deformation under heavy load. The column moving design guarantees high accuracy even after a prolonged period of operation and minimizes footprint.



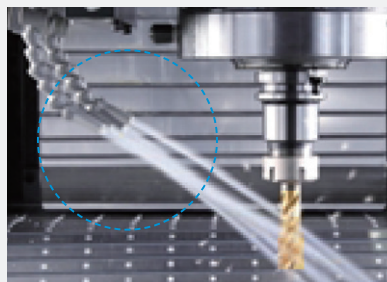
High-speed Auto Pallet Changer

The dual table equipped with standard auto-indexing pallet enables stable positioning and improved productivity with minimized idle time.



Convenience

Diverse optional features are available for customized requirements.



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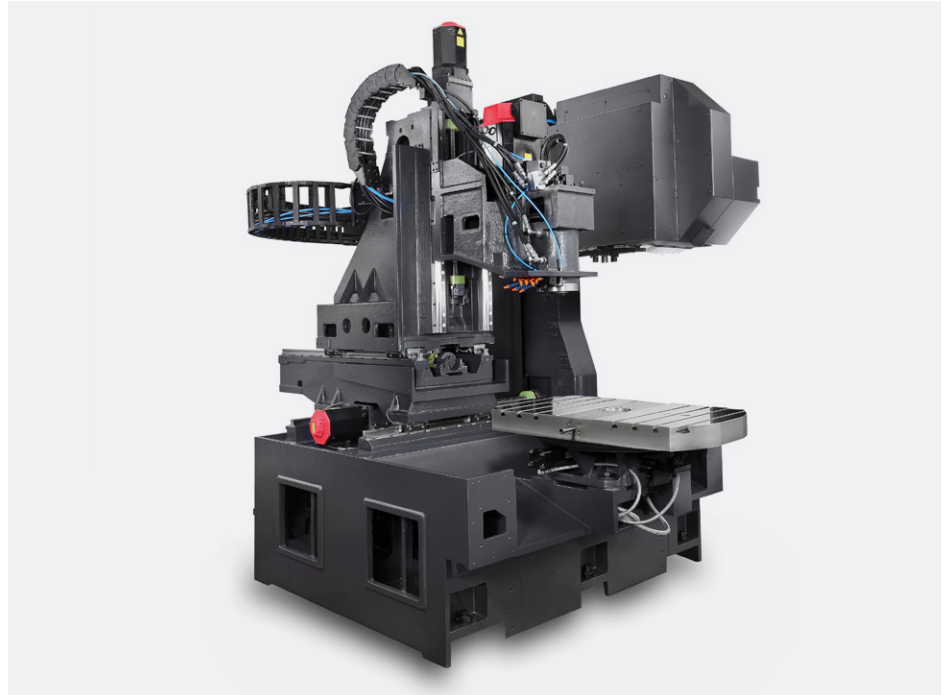
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The high rigidity machine structure maintains stable accuracy for long periods even during heavy duty cutting.

Stable column moving structure

The moving column structure eliminates the root causes of fatigue and vibration caused by high frequency rapid movements over long periods of running and optimizes durability and accuracy. The machine footprint is also minimized.

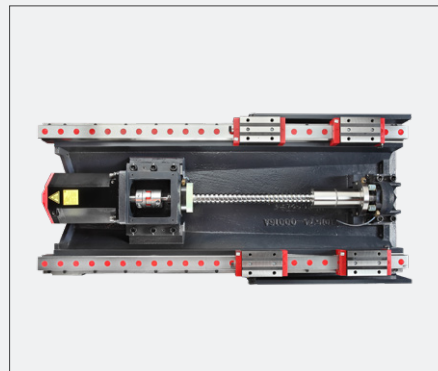


Axis Feed System

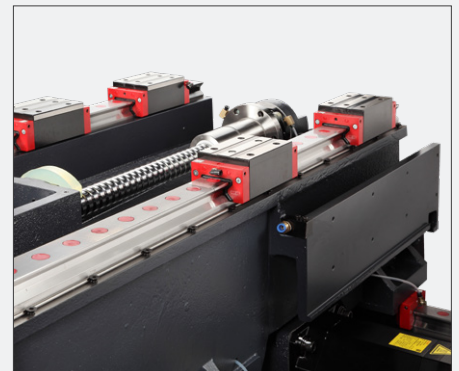
High-precision feed structure

Roller-type Linear Guideway and the highly rigid coupling are adopted for improving rigidity and accuracy of the linear feed system in X, Y and Z directions. The nut cooling system minimizes thermal displacement of the ball screw to satisfy the speed and the accuracy requirements.

High-rigidity Roller Type Linear Guideway



Rigidity and accuracy of feed system are improved with Roller Type LMG and Coupling.



Roller type linear guideway

Description		X	Y	Z
VC 430	Travels (mm)(inch)	560(22.0)	430(16.9)	570(22.4)
	Rapid traverse rate (m/min)(imp)	40(1574.8)	40(1574.8)	36(1417.3)
VC 510	Travels (mm)(inch)	762(30.0)	516(20.3)	570(22.4)
	Rapid traverse rate (m/min)(imp)	40(1574.8)	40(1574.8)	32(1259.8)

Tool Changer

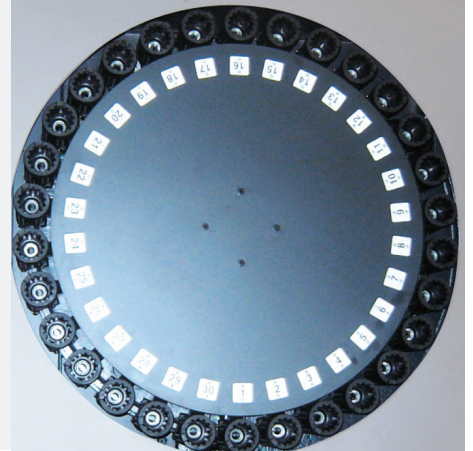
Tool magazine

The drum-shape tool magazine mounted on the right of the machine is driven by the motor and the cam to guarantee high reliability. The magazine can be expanded to hold maximum 40 tools when optionally selected.

Tool storage capacity

30 Tools

40 Tools option



Automatic tool changer

Rapid tool change at speed of 3 seconds for T-T-T to enhance productivity. The drum-shape ATC mounted on the right of the machine is interoperated with the CAM.

Tool change time (T-T-T)

1.3 / 1.6 s option

Tool change time (C-T-C)

4.3 / 4.6 s option

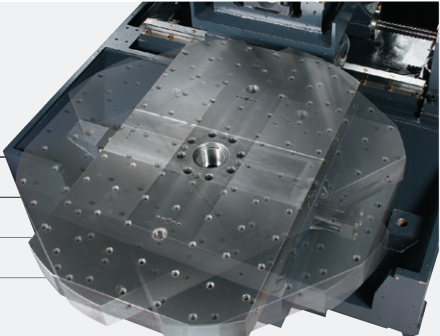


Pallet

Automatic Rapid Pallet Changer (APC)

- The dual table with the standard automatic indexing pallet is of rack & pinion type and rotates through 180 degrees. It features a 6 ton clamping force.
- The table with the horizontal machine bed directly connected allows stable positioning and minimal non-cutting time to improve productivity.
- Hydraulic lines for fixtures and electrical cables for rotary tables can be supplied via the central column of the indexing pallet, thus allowing pallet rotation whilst maintaining services connection.

Model	VC 430	VC 510
Pallet change time	5 s	5.5 s
Pallet loading capacity	2-300 kg (2-661.4 lb)	2-350 kg (2-771.6 lb)
Pallet size	2-712 × 490 mm (2-28.0 × 19.3 inch)	2-860 × 570 mm (2-33.9 × 22.4 inch)



Spindle

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The high speed spindle maintains accuracy during fine machining and also provides sufficient power for heavy duty cutting performance.

High-Speed, High-Precision Spindle

The high-speed spindle of 10,000 (12,000) rpm is supported high-precision bearing for ensuring stable accuracy under high speed cutting operation. In addition, a spindle motor of higher power is mounted for heavy duty cutting.



High speed spindle

10000 r/min

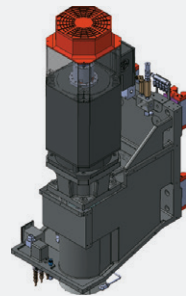
* Belt type

12000 r/min option

* Direct type

Motor power (30min/con.)

18.5 / 15 kW
(24.8 / 20.1 Hp)



High torque spindle

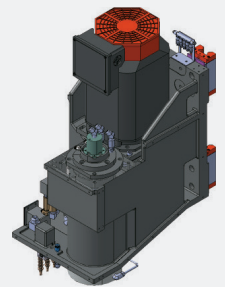
6000 r/min option

* Belt type

* Only VC 510

Motor power (30min/con.)

15/11 kW
(20.1 / 14.8 Hp)



Spindle Head Cooling System

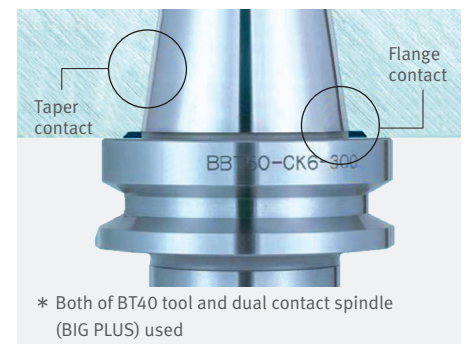
The spindle cooling system maintains temperature relative to the ambient value and circulates cooling oil around the bearings to reduce thermal growth due to high speed running over long periods.



* Not available for 6000 rpm.

Dual Contact Spindle

Tool rigidity is enhanced by the firm clamping of the spindle. Tool lifecycle and cut-surface roughness have been improved as a result of the reduced vibration realized by the dual contact spindle.



* Both of BT40 tool and dual contact spindle (BIG PLUS) used



Cutting Performance

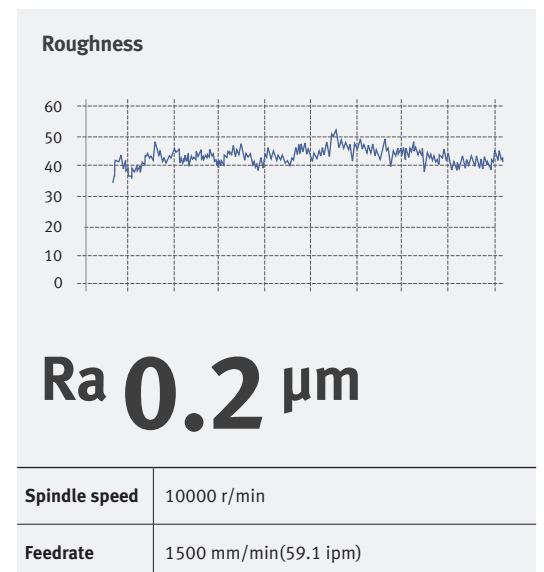
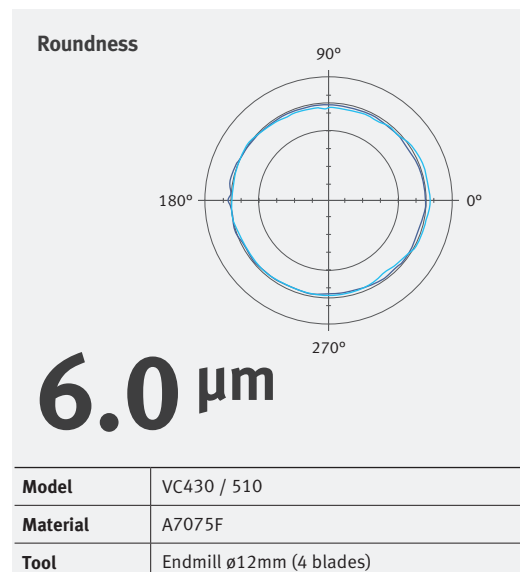
VC 430 / VC 510

Delivers excellent performance under diverse machining conditions.

Face mill Carbon steel (SM45C)			
ø80mm Face mill (6Z)			
Machining rate (cm ³ /min(inch ³ /min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
432(26.4)	1500	2700(106.3)	
Face mill Gray casting (GC25)			
ø80mm Face mill (6Z)			
Machining rate (cm ³ /min(inch ³ /min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
691(42.2)	1500	3600(141.7)	
Face mill Aluminum (AL6061)			
ø80mm Face mill (6Z)			
Machining rate (cm ³ /min(inch ³ /min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
1785(108.9)	1500	5580(219.7)	
End mill Carbon steel (SM45C)			
ø30mm Endmill (6Z)			
Machining rate (cm ³ /min(inch ³ /min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
36(2.2)	222	80(3.1)	
U-drill Carbon steel (SM45C)			
Machining rate (cm ³ /min(inch ³ /min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
172(10.5)	750	84(3.3)	
Tap Carbon steel (SM45C)			
Tool	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
M30 x P3.5	212	742(29.2)	

* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Machining Accuracy



* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.



Standard/Optional Specifications

Diverse optional features are available to meet specific customer requirements.

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● Standard ○ Optional X N/A

NO.	Description	Features	VC 430	VC 510
1	Air blower		○	○
2	Air gun		○	○
3	Auto tool changer	30 Tools	●	●
4		40 Tools	○	○
5	Coolant chiller		○	○
6	Coolant gun		○	○
7	Coolant tank		●	●
8	Coolant level switch : Sensing level - Low / High		○	○
9	Data server	NONE	●	●
10		FUNCTION & MEMORY CARD_1GB	○	○
11	Electric cabinet air conditioner		○	○
12	Electric cabinet light		○	○
13	Electric cabinet line filter		○	○
14	Hydraulic fixture interface	NONE	●	●
15		A LINE_1 PAIR_EACH PALLET	○	○
16	MPG	1 MPG_PORTABLE TYPE	●	●
17		1 MPG_PORTABLE_W/ENABLE TYPE	○	○
18	NC system	DOOSAN FANUC i	●	●
19	NC system lcd size	8.4 inch (Color)	●	●
20		10.4 inch (Color)	○	○
21	Oil cooler	6000 r/min	X	X
22		10000 r/min	●	●
23		12000 r/min	●	●
24	Oil Skimmer	Belt type	○	○
25	Pallet type	2_30-M16 X P2.0 TAP	●	X
26		2_4-100 X 18H8 T-SLOTS	○	X
27		2_42-M16 X P2.0 TAP	X	●
28		2_5-100 X 18H8 T-SLOTS	X	○
29	Pneumatic fixture interface	P/T LINE_1 PAIR_EACH PALLET	●	●
30		A/B LINE_1 PAIR_EACH PALLET	○	○
31	Power transformer		○	○
32	Rigid tapping		●	●
33	Shower coolant	NONE	●	●
34		1.1 kW_0.1MPA_200L/MIN_220V	○	○
35	Spindle motor power	15/11 kW	X	○
36		18.5/15 kW	●	●
37	Spindle speed	6000 r/min	X	○
38		10000 r/min	●	●
39		12000 r/min	○	○
40	Test bar		○	○
41	Through spindle coolant	NONE	●	●
42		1.5 KW_2.0 MPA	○	○
43		4.0 KW_2.0 MPA	○	○
44		5.5 KW_7.0 MPA_DUAL BAG FILTER	○	○
45	Work & tool counter	WORK / TOOL	○	○
46	Customized Special Option	COOLANT SYSTEM - HIGH PRESSURE TSC1	○	○
47		APPLY GREASE LUBRICATION	○	○

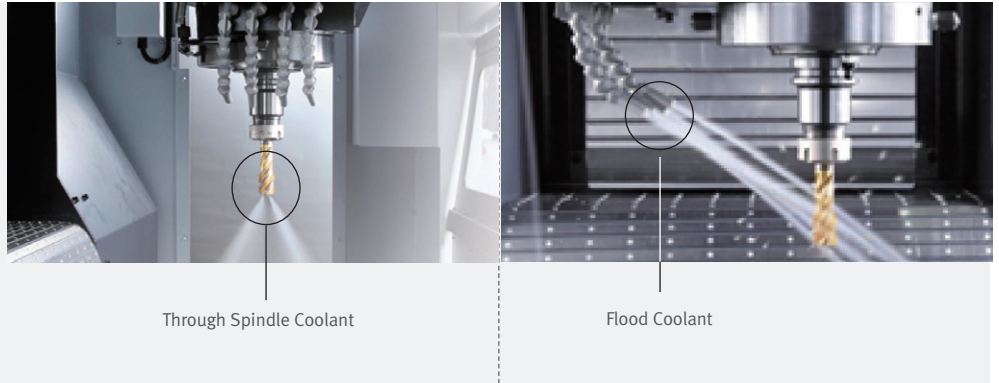
* Please contact DOOSAN to select detailed steady rest specifications.

Optional Equipments

Through-spindle coolant spray system

option

Coolant supply around the spindle nose is standard equipment. The coolant tank is separated from the machine structure to prevent heat transfer. Through spindle coolant (TSC) is an option.

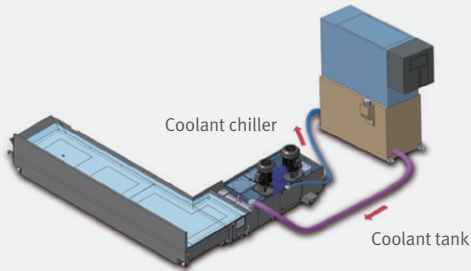


Through Spindle Coolant

Flood Coolant

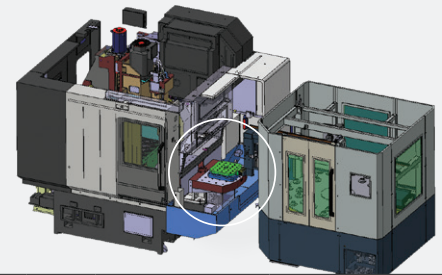
Coolant Chiller (strongly recommended) **option**

Heat is transferred from the coolant during cutting to the machine structure and can cause thermal deformation. To maintain optimum machining accuracy, a coolant chiller is recommended which recirculates the coolant and controls its temperature. This significantly improves overall precision.



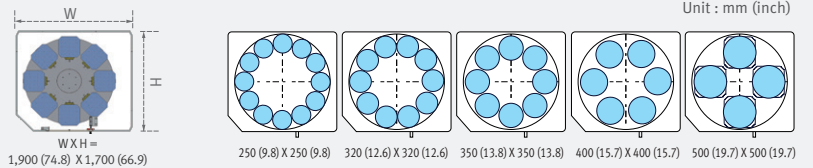
AWC system **option**

The optimized solution to realize compact automation system through automatic work-piece change system.



Max. workpiece dimensions	Unit	Count	Max. loading	Max. construction height on the pallet
250 x 250 (9.8x9.8) or ø 300 (11.8)	mm (inch)	12	250kg (551.1lb)	350mm (13.8inch)
320 x 320 (12.6x12.6) or ø 360 (14.2)	mm (inch)	10		
350 x 350 (13.8x13.8) or ø 400 (15.7)	mm (inch)	8		
400 x 400 (15.7x15.7) or ø 450 (17.7)	mm (inch)	6		
500 x 500 (19.7x19.7) or ø 550 (21.7)	mm (inch)	4		

Pallet Storage-Table Configuration

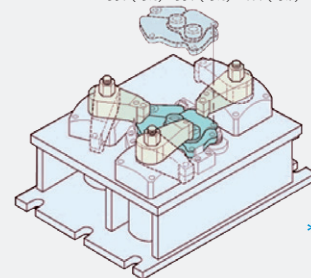


Interface for Additional Equipment (4 Axes)

Fixture check list(for hydraulic / pneumatic Fixtures)

- Pressure source
 - Hydraulic P/T A/B
 - Pneumatic P/T A/B
- Number of ports_Each Pallet
 - 1pair(2-pt1/4" port)_each pallet
 - 2pair(4-pt1/4" port)_each pallet
 - 3pair(6-pt1/4" port)_each pallet
- Hydraulic power unit
 - Supply scope : User DOOSAN
 - Use Doosan standard unit 24L / min, 4.9 MPa
 - Special requirement _____ L / min, _____ MPa

350 (13.8) X 350 (13.8) 400 (15.7) X 400 (15.7) 500 (19.7) X 500 (19.7)

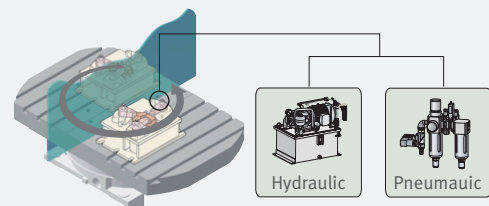


* Contact Doosan for more information

Hydraulic fixture line

Pneumatic or hydraulic lines supply power from a central power pack to fixtures on each side of the indexing pallet via the center of the table. Various numbers of supply lines and operating pressures are available.

Recommended Rotary Table Size
VC 430 : Ø170mm (Ø6.7 inch) /
VC 510 : Ø200mm (Ø7.9 inch)



DOOSAN Fanuc i Plus

15 inch screen + New OP

DOOSAN Fanuc i Plus' operation panel enhances operating convenience by incorporating common-design buttons and layout, and features the Qwerty keyboard for fast and easy operation.

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DOOSAN Fanuc i Plus is optimized for maximizing customer productivity and convenience.

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DOOSAN Fanuc i Plus

- 15 inch color display
- Intuitive and user-friendly design

USB & PCMCIA card QWERTY keyboard

- EZ-guide i standard
- Ergonomic operator panel
- 2MB Memory
- Hot key

1. MPG handle



2. Tool magazine button



Magazine : Magazine :
CW CCW

3. PCMCIA Card & USB Port

PCMCIA Card

The PCMCIA card enables uploading and downloading of the NC program, NC parameters, tool information, and ladder programs, and also supports DNC operation.

USB Port

The USB memory stick enables uploading and downloading of the NC program, NC parameters, tool information and ladder programs. (DNC operation is not supported.)



4. Swiveling operation panel

The operation panel is capable of swiveling by 90 degrees to enhance convenience.

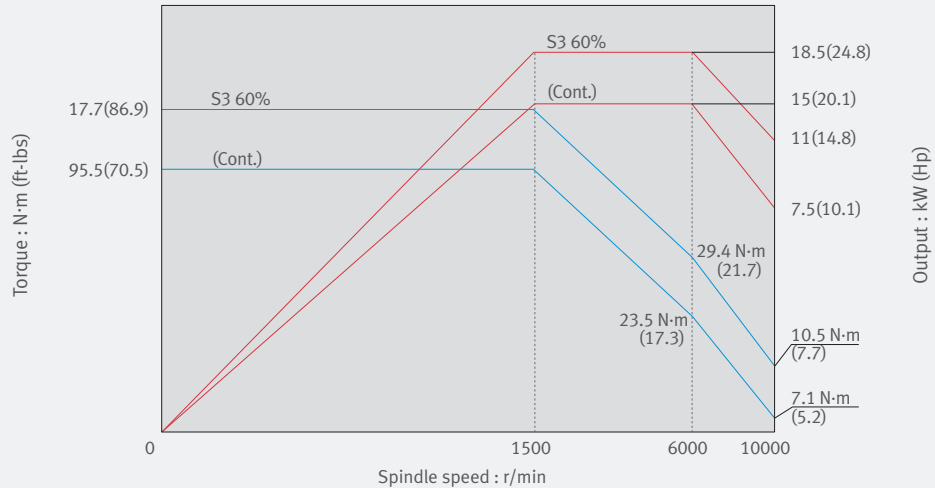


Spindle Power – Torque Curve

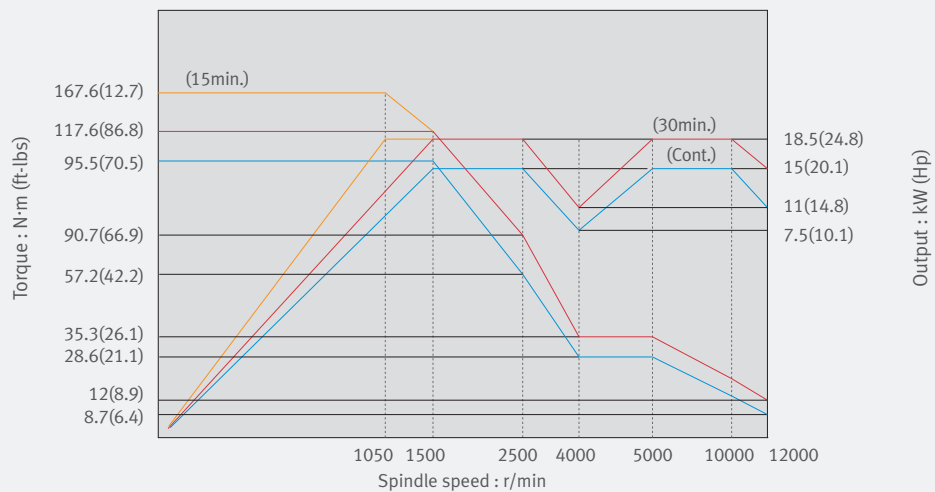
VC 430 / VC 510

High speed spindle

Max. spindle speed : 10000 r/min
 Spindle motor power : 18.5 / 15 kW (24.8 / 20.1 Hp)

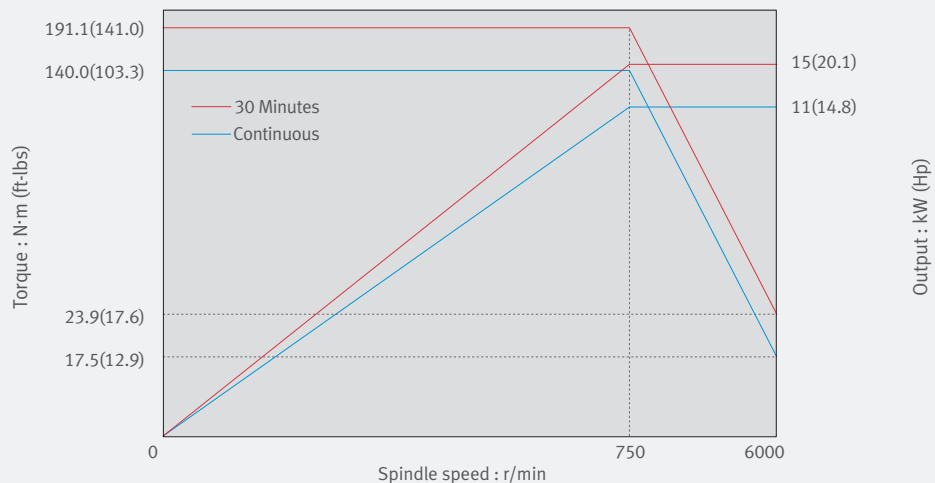


Max. spindle speed : 12000 r/min
 Spindle motor power : 18.5 / 15 kW (24.8 / 20.1 Hp) **option**



High torque spindle

Max. spindle speed : 6000 r/min
 Spindle motor power : 15 / 11kW (20.1 / 14.8 Hp) **option**
 (Only VC 510)



External Dimensions

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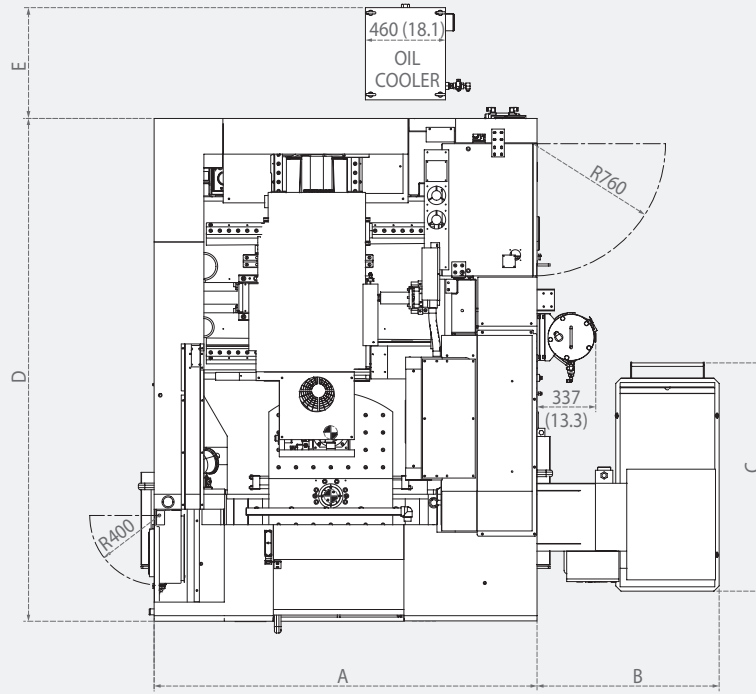
Unit : mm (inch)

Detailed Information

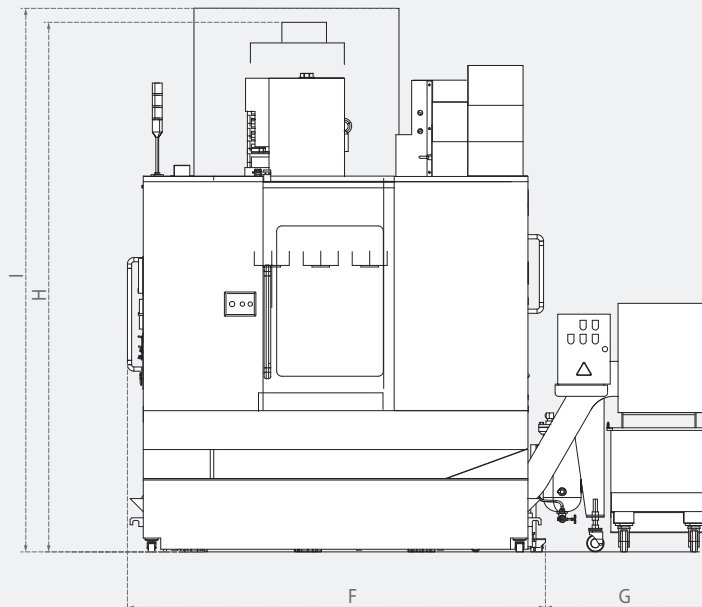
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Top view



Front View



Item	Unit	A	B	C	D	E	F	G	H			I
									Belt type	Direct type	With top cover	
VC 430	mm	2200 (86.6)	1046 (41.2)	1312 (51.7)	2890 (113.8)	637 (25.1)	2391 (94.1)	946 (37.2)	2738 (107.8)	3030 (119.3)	3110 (122.4)	
VC 510	(inch)	2580 (101.6)	1100 (43.3)		3260 (128.3)	590 (23.2)	2580 (101.6)	1100 (43.3)	2830 (111.4)	3130 (123.2)	3250 (128.0)	

VC 430 /
VC 510

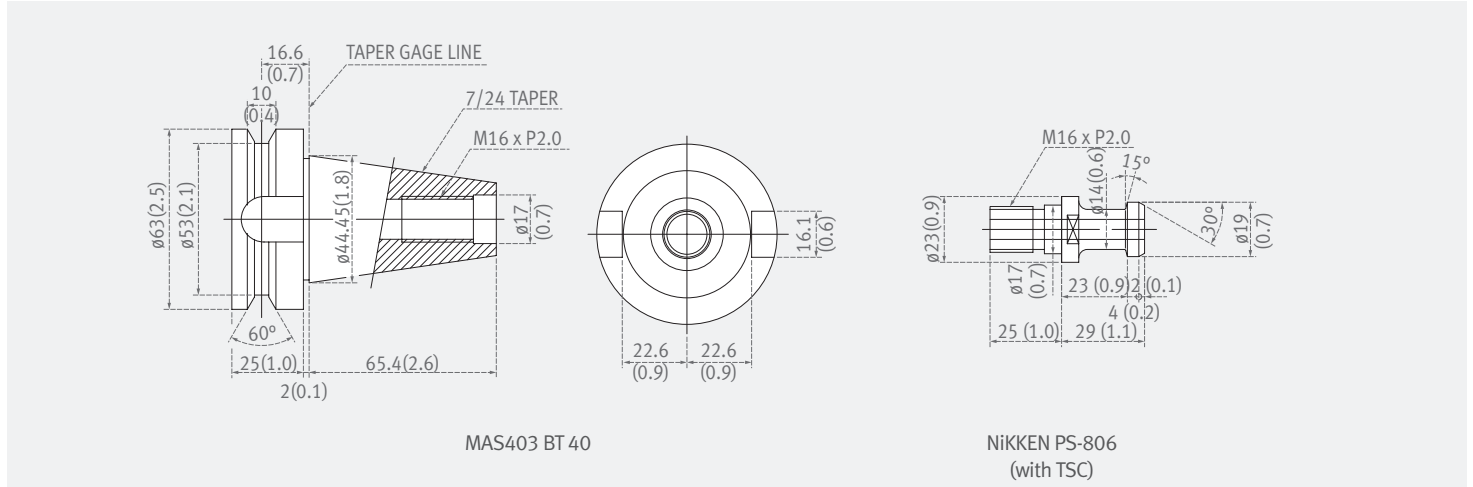
* Some peripheral equipment can be placed in other places

Tool Shank

Tool shank

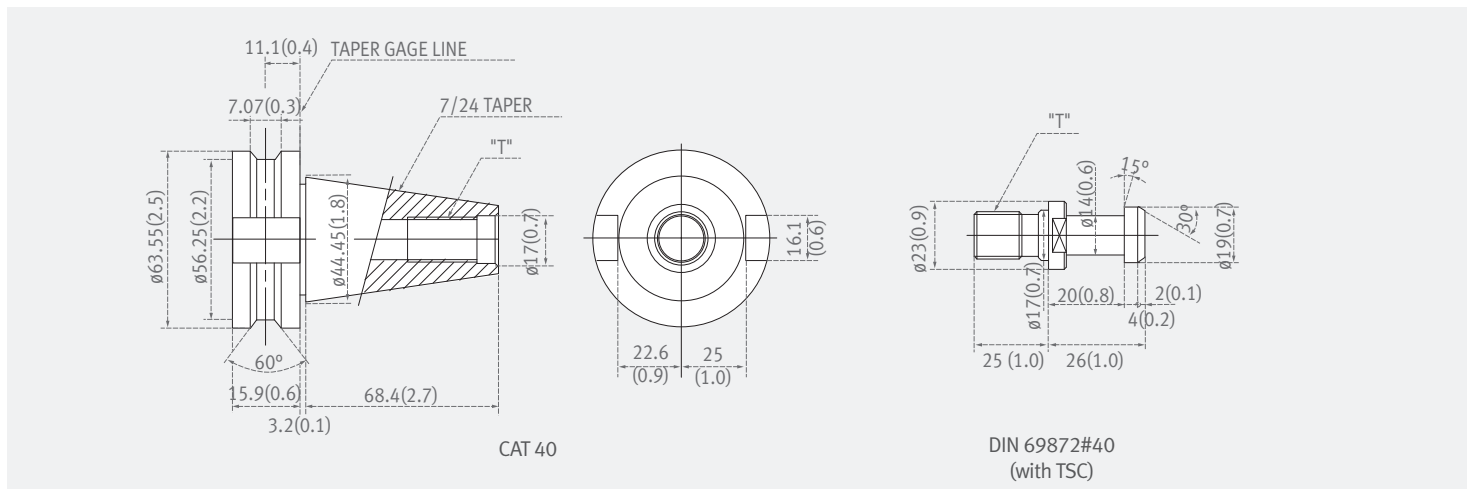
BT

Unit : mm (inch)



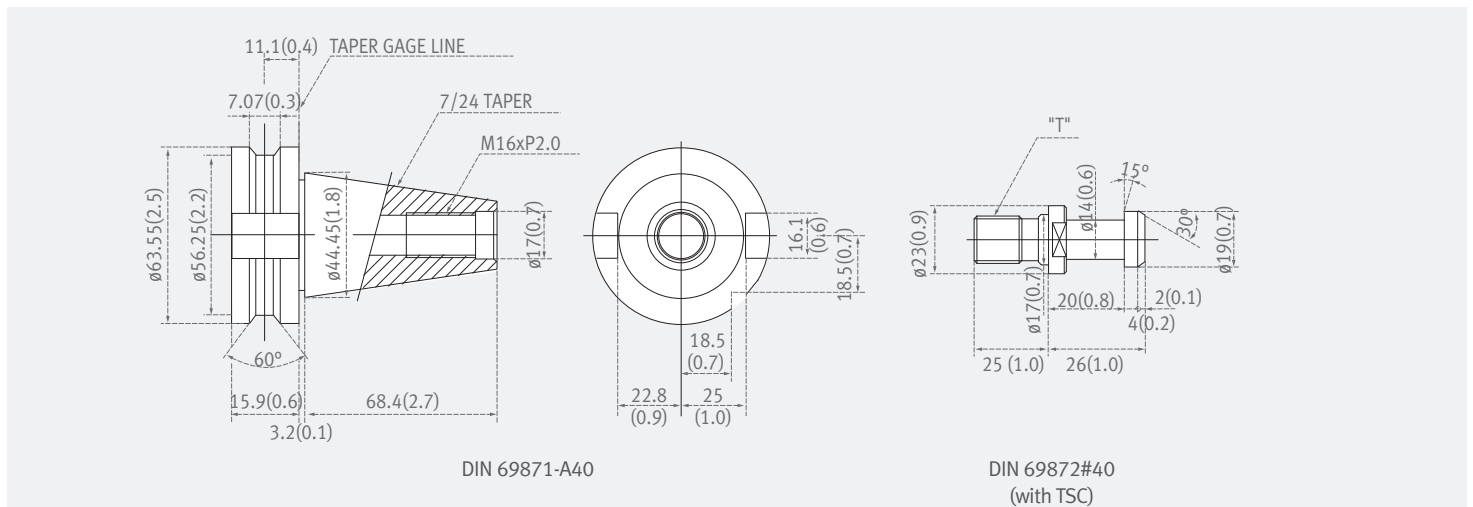
CAT option

Unit : mm (inch)



DIN option

Unit : mm (inch)



Pallet dimension

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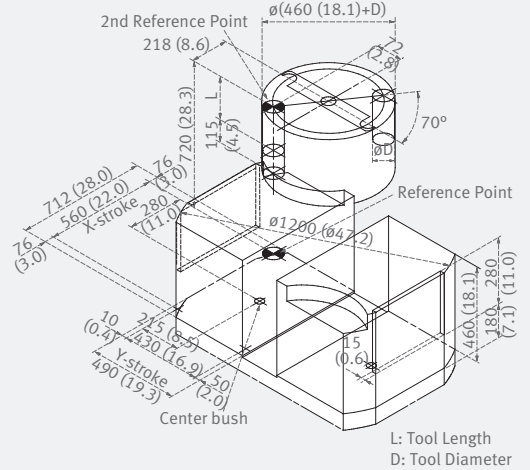
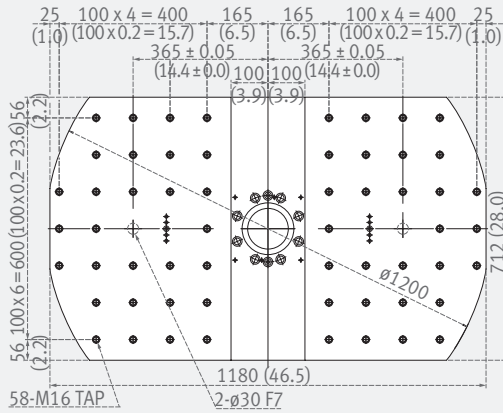
VC 430

Unit : mm (inch)

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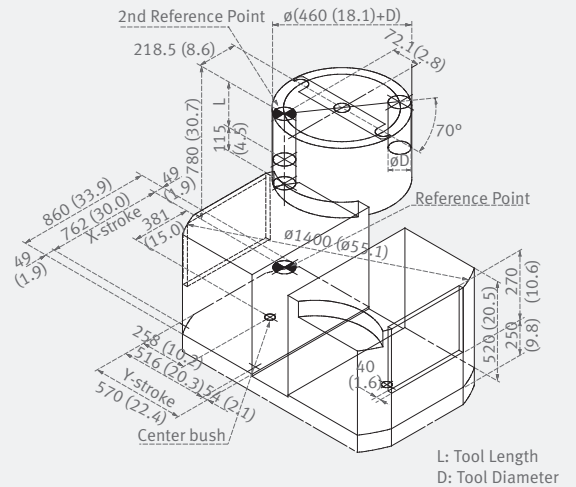
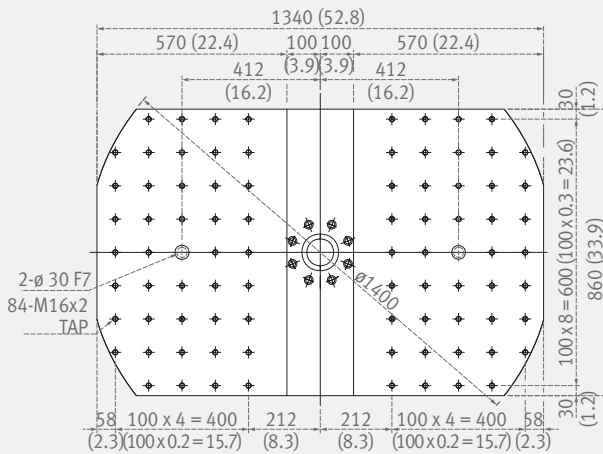
Customer Support Service



* If the size of the workpiece is larger than the indicated limit, it may collide with the column, ATC, splash guard, etc.

VC 510

Unit : mm (inch)



* If the size of the workpiece is larger than the indicated limit, it may collide with the column, ATC, splash guard, etc.

Machine Specifications



Features		Unit	VC 430	VC 510
Travels	X-axis	mm (inch)	560 (22.0)	762 (30.0)
	Y-axis	mm (inch)	430 (16.9)	516 (20.3)
	Z-axis	mm (inch)	570 (22.4)	
	Distance from spindle nose to table top	mm (inch)	150 (5.9) ~ 720 (28.3)	210 (8.3) ~ 780 (30.7)
	Distance from spindle center to column guideway	mm (inch)	495 (19.5)	530 (20.9)
Travels	X-axis	mm (inch)	560 (22.0)	762 (30.0)
	Y-axis	mm (inch)	430 (16.9)	516 (20.3)
	Z-axis	mm (inch)	570 (22.4)	
	Distance from spindle nose to table top	mm (inch)	150 (5.9) ~ 720 (28.3)	210 (8.3) ~ 780 (30.7)
	Distance from spindle center to column guideway	mm (inch)	495 (19.5)	530 (20.9)
Feedrate	Rapid traverse rate (X / Y / Z)	m/min (ipm)	40 / 40 / 36 (1574.8 / 1574.8 / 1417.3)	40 / 40 / 32 (1574.8 / 1574.8 / 1259.8)
	Cutting feedrate	mm/min (ipm)	18000 (708.7)	16000 (629.9)
Pallet	Pallet size	mm (inch)	2-712 x 490 (2-28.0 x 19.3)	2-860 x 570 (2-33.9 x 22.4 inch)
	Pallet loading capacity	kg (lb)	2-300 (2-661.4)	2-350 (2-771.6)
	Max. workpiece height	mm (inch)	460 ⁽¹⁾ (18.1)	520 ⁽¹⁾ (20.5)
	Pallet surface	-	2-29-M16 x P2.0	42-M16 x P2.0 Taper
Spindle	Max. spindle speed	r/min	10000 {12000, 14000}*	10000 {6000, 12000}*
	Spindle taper	-	ISO #40 7/24 Taper	
	Max. spindle torque	N·m(ft-lbs)	117.7 {167.6}* (86.9 {123.7})	117.7 {191.1, 167.6}* (86.9 {141.0, 123.7})
Automatic tool changer	Type of tool shank	-	MAS403 BT40	
	Tool storage capacity	ea	30 {40}*	
	Max. tool diameter (without adjacent tools)	mm (inch)	80 {76}* (125) (3.1 {3.0} (4.9))	
	Max. tool length	mm (inch)	220 ⁽²⁾ (8.7) / 300 ⁽³⁾ (11.8)	
	Max. tool weight	mm (inch)	8 (0.3)	
	Max. tool moment	N·m(ft-lbs)	5.88 (4.3)	
	Tool change time (chip-to-chip)	s	60Hz {50Hz}* : 1.3 {1.6}*	
Automatic pallet changer	Number of pallet	ea	2	
	Pallet change time	s	5	5.5
Motor	Spindle motor	kW (Hp)	18.5 / 15 (24.8 / 20.1)	18.5 / 15 (24.8 / 20.1) (10000, 12000 r/min) 15 / 11(20.1 / 14.8) (6000 r/min)
	Feed motor (X / Y / Z)	kW (Hp)	4.0 / 4.0 / 4.0 (5.4 / 5.4 / 5.4)	
Power source	Electric power supply (rated capacity)	kVA	40.2 (10000 r/min) 35.1 (12000 r/min)	39.4 (6000 r/min) 40.2 (10000 r/min) 35.1 (12000 r/min)
	Compressed air supply	MPa	0.54	
Tank capacity	Coolant tank capacity	L (gallon)	300 (79.3)	420 (111.0)
	Lubrication tank capacity (available)	L (gallon)	2 (0.5)	
Machine Dimensions	Height	mm (inch)	3030 (119.3)	3130 (123.2)
	Length	mm (inch)	2890 (113.8)	3260 (128.3)
	Width	mm (inch)	2200 (86.6)	3130 (123.2)
	Weight	kg (lb)	7800 (17195.8)	9200 (20282.2)
Control	NC system		DOOSAN Fanuc i Plus, HEIDENHAIN TNC 620 NC	

* { } : Optional

(1) This value is the maximum for the height of rectangular without interference of ATC operating.

(2) Available with pallet change.

(3) Available in tool magazine.

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FANUC

Item	Spec.	DOOSAN Fanuc i Plus		
AXES CONTROL	Controlled axes	3 (X,Y,Z)	X, Y, Z	
	Additional controlled axes	5 axes in total	○	
	Least command increment	0.001 mm / 0.0001"	●	
	Least input increment	0.001 mm / 0.0001"	●	
	Interpolation type pitch error compensation		●	
INTERPOLATION & FEED FUNCTION	2nd reference point return	G30	●	
	3rd / 4th reference return		●	
	Inverse time feed		●	
	Cylindrical interpolation	G07.1	●	
	Helical interpolation B	Only Fanuc 30i	X	
	Smooth interpolation		X	
	NURBS interpolation		X	
	Involute interpolation		X	
	Helical involute interpolation		X	
	Bell-type acceleration/deceleration before look ahead interpolation		●	
	Smooth backlash compensation		○	
	Automatic corner override	G62	●	
	Manual handle feed	Max. 3unit	1 unit	
	Manual handle feed rate	x1, x10, x100 (per pulse)	●	
	Handle interruption		○	
	Manual handle retrace		○	
	Manual handle feed 2/3 unit		X	
	Nano smoothing	AI contour control II is required.	○	
	AI APC	20 BLOCK	X	
	AICC I	30 BLOCK	X	
	AICC I	40 BLOCK	X	
	AICC II	200 BLOCK	●	
	AICC II	400 BLOCK	○*1)	
	High-speed processing	600 BLOCK	X	
	Look-ahead blocks expansion	1000 BLOCK	X	
	DSQ I	AICC II (200block) + Machining condition selection function	X	
	DSQ II	AICC II (200block) + Machining condition selection function + Data server(1GB)	X	
	DSQ III	AICC II with high speed processing (600block) + Machining condition selection function + Data server(1GB)	X	
	Fine Surface Machining	Look-ahead block no. is Max. 200 - AI contour control II+ - Smooth tolerance control+ - Jerk control	●	
	SPINDLE & M-CODE FUNCTION	M- code function		●
		Retraction for rigid tapping		●
		Rigid tapping	G84, G74	●
TOOL FUNCTION	Number of tool offsets	64 ea	X	
	Number of tool offsets	99 ea	X	
	Number of tool offsets	200 ea	X	
	Number of tool offsets	400 ea	400 ea	
	Number of tool offsets	499 / 999 / 2000 ea	X	
	Tool nose radius compensation	G40, G41, G42	●	
	Tool length compensation	G43, G44, G49	●	
	Tool life management		●	
	Addition of tool pairs for tool life management		●	
	Tool offset	G45 - G48	●	

● Standard ○ Optional X N/A

Item	Spec.	DOOSAN Fanuc i Plus	
PROGRAMMING & EDITING FUNCTION	Custom macro	●	
	Macro executor	○	
	Extended part program editing	●	
	Part program storage	256KB (640m)	X
	Part program storage	512KB (1,280m)	X
	Part program storage	1MB (2,560m)	X
	Part program storage	2MB (5,120m)	5,120m
	Part program storage	4MB (1,0240m)	X
	Part program storage	8MB (2,0480m)	X
	Inch/metric conversion	G20 / G21	●
	Number of Registered programs	400 ea	X
	Number of Registered programs	500 ea	X
	Number of Registered programs	1000 ea	1000 ea
	Number of Registered programs	4000 ea	X
	Optional block skip	9 BLOCK	●
	Optional stop	M01	●
	Program file name	32 characters	X
	Program number	04-digits	●
	Playback function		●
	Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs
	Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	X
	Tilted working plane indexing command	G68.2	○
	Tilted working plane indexing function	Programming TWP command on guidance window	○
OTHERS FUNCTIONS (Operation, setting & Display, etc)	Embeded Ethernet	●	
	Graphic display	Tool path drawing	●
	Loadmeter display		●
	MDI / DISPLAY unit	15" color LCD	●
		15" color LCD	X
		15" color LCD with Touch Panel	X
	Memory card interface		●
	USB memory interface	Only Data Read & Write	●
	Operation history display		●
	DNC operation with memory card		●
	Optional angle chamfering / corner R		●
	Run hour and part number display		●
	High speed skip function		○
	Polar coordinate command	G15 / G16	●
	Polar coordinate interpolation	G12.1 / G13.1	X
	Programmable mirror image	G50.1 / G51.1	●
	Scaling	G50, G51	●
	Single direction positioning	G60	●
	Pattern data input		●
	Jerk control	AI contour control II is required.	○
	Fast Data server with 1GB PCMCIA card		○
	Fast Ethernet		○
	3-dimensional coordinate conversion		X
	3-dimensional tool compensation		X
	Figure copying	G72.1, G72.2	X
	Machining time stamp function		X
	Machine alarm diagnosis		●
	CNC screen display		●
	CNC screen dual display function		●
	One touch macro call		○
	Machining condition selection function	10 LEVELS	● ^{*2)}
Machining quality level adjustment	3 LEVELS	○ ^{*2)}	
EZ Guide i (Conversational Programming Solution)		●	
iHMI with Machining Cycle		X	
MANUAL GUIDE i		X	

*1) AICC2 (400block) of 0iMF must be changed to High Speed Main board. Ask R&D center for information.

*2) If This funtion is selected, Step of Machining condition selection function is changed from 10 levels to 3 levels.

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No.	Division	Item	Spec.	TNC 620	
1	Axes control	Controlled axes	3 axes	X, Y, Z	
2		Controlled axes	4 axes	○	
3		Simultaneously controlled axes	Controlled axes	●	
4		Controlled axes	Max. 18 axes in total	OPT(Max. 6axes)	
5		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	●	
6		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	●	
7		Axis feedback control	Double-speed control loops for high-frequency spindles and torque/linear motors	○	
8		MDI / DISPLAY unit	15.1 inch TFT color flat panel	●	
9	Configuration	Machine parameters	Tree structure with symbolic names of the parameters	●	
10			Tabular representation	●	
11	Commissioning and diagnostics	Integrated oscilloscope		●	
12		OnLine monitor (OLM)		●	
13		BUS diagnostics		●	
14		DriveDiag		●	
15		ApiData function		●	
16		Trace function		●	
17		Table function		●	
18		Logic diagram		●	
19		I/O-Force List		●	
20		Log		●	
21		Machine operating panel	TE 735	●	
22		Electronic handwheels	HR 510	●	
23		Data interfaces	Ethernet interface	●	
24			USB interface (USB 2.0)	●	
25		Feedrate override	0 - 150 % (10% unit)	●	
26		Spindle orientation		●	
27		Spindle speed command	S5 digits	●	
28		Spindle speed override	10 - 150 %	●	
29		Monitoring functions	Position monitoring		●
30			Movement monitoring		●
31	Standstill monitoring			●	
32	Positioning window			●	
33		Temperature monitoring	●		
34	Gantry axes and master-slave torque control		○		
35		Max. 5000 blocks.	●		
36	HSC filters		●		
37	Switching the traverse ranges		●		
38	C-axis operation	Spindle motor drives the rotary axis	●		
39	program input	With smartSelect	●		
40	Position entry	Nominal positions for lines and arcs in Cartesian coordinates		●	
41		Incremental or absolute dimensions		●	
42		Display and entry in mm or inches		●	
43		Display of the handwheel path during machining with handwheel superimpositioning		●	
44		Paraxial positioning blocks	●		
45	Tool compensation	In the working plane and tool length		●	
46		Radius-compensated contour lookahead for up to 99 blocks (M120)		○	
47		Three-dimensional tool radius compensation		○	
48	Tool table	Central storage of tool data		●	
49		Multiple tool tables with any number of tools		●	
50	Cutting data calculator	Calculation of spindle speed and relative to the path of the tool center or to the tool's cutting edge		●	
51	Constant contouring speed	Creation of a program while another program is being run		●	
52	Parallel operation			●	
53	MDI mode			●	
54	Tilting the working plane with Cycle 19			○	
55	Tilting the working plane with the PLANE function			○	
56	Manual traverse in tool-axis direction	after interruption of program run		●	
57	User functions	Function TCPM	Retaining the position of tool tip when positioning tilting axes	○	
58		Rotary table machining	Programming of cylindrical contours as if in two axes	○	
59			Feed rate in distance per minute	○	
60		FK free contour programming	for workpieces not dimensioned for NC programming	●	
61		Program jumps	Subprograms and program section repeats		●
62			Calling any program as a subprogram		●
63		New 3-D simulation graphics in full detail		●	
64		Program verification graphics	Plan view, view in three planes, 3-D view		●
65			3-D line graphics		●
66		Programming graphics	2-D line graphics		●
67		Program-run graphics	(plan view, view in three planes, 3-D view)		●
68		Calculator			●
69	Entry of text and special characters			●	
70	Comment blocks in NC program			●	
71	"Save As" function			●	
72	Structure blocks in NC program			●	
73	Entry of feed rates	FU (feed per revolution)		●	
74		FZ (tooth feed per revolution)		●	
75	Processing DXF data			○	
76	KinematicsOpt	Automatic measurement and optimization of machine kinematics		○	
77	KinematicsComp	Three-dimensional compensation		○	
78	Touch probe cycles	Calibrating the effective radius on a circular stud		●	
79		Calibrating the effective radius on a sphere		●	
80	Save kinematics			○	
81	Cycles for automatic workpiece inspection	Measure kinematics		○	
82		Preset compensation		○	
83		TS calibration of length		●	
84		TS calibration in a ring		●	
85	TS calibration on stud		●		
86	Options	Software option 1		○	
87		Software option 2		○	
88		Python OEM Process	Execute Python applications		○

Responding to Customers Anytime, Anywhere

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.



Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service



Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair



Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy



Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering



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**Fire Safety
Precautions**

There is a high risk of fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting use coolants and modifying the machine without the consent of the manufacturer. Please check the SAFETY GUIDANCE carefully before using the machine.