

HIGH PRODUCTIVITY TWIN TABLE VERTICAL MACHINING CENTER



430 • 510





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.





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.

BASIC STRUCTURE

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.

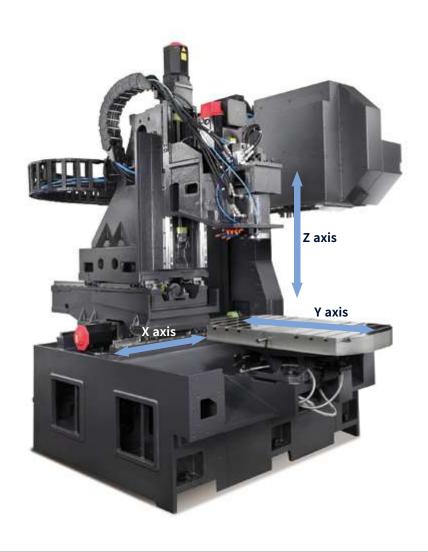
Travel distance (X / Y / Z axis)

VC 430

560 / 430 / 570 mm 22.0 / 16.9 / 22.4 inch

VC 510

762 / 516 / 570 mm 33.0 / 20.3 / 22.4 inch



Rapid traverse rate (X / Y / Z axis)

VC 430

40 / 40 / 36 m/min 1574.8 / 1574.8 / 1417.3 ipm

VC 510

40 / 40 / 32 m/min 1574.8 / 1574.8 / 1259.8 ipm

High-precision feed structurea

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.



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



Roller type linear guideway

SPINDLE

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.

Max. spindle speed

10000 r/min **12000** r/min option







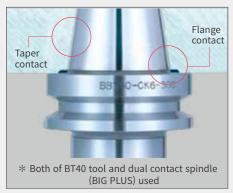
Spindle head cooling system

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.



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.



*Not available for 6000 rpm.

CUTTING PERFORMANCE

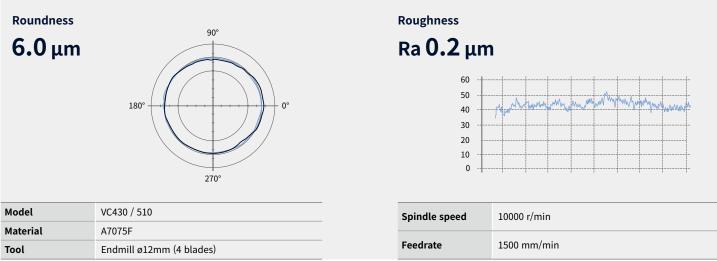
Machining performance

Delivers excellent performance under diverse machining conditions.

Face mill Carbon steel (SM45C)			
ø80mm Face mill (6Z)			
Machining rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	64mm
432 (26.4)	1500	2700 (106.3)	2.5inch
Face mill Gray casting (GC25)			
ø80mm Face mill (6Z)			
Machining rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	64mm
691 (42.2)	1500	3600 (141.7)	2.5inch
Face mill Aluminum (AL6061)			
ø80mm Face mill (6Z)			
Machining rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	64mm
1785 (108.9)	1500	5580 (219.7)	2.5inch
End mill Carbon steel (SM45C)			0000
ø30mm Endmill (6Z)			
Machining rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
36 (2.2)	222	80 (3.1)	
U-drill Carbon steel (SM45C)			10000
Machining rate (cm³/min(inch³/min))	Spindle speed (r/min)	Feedrate (mm/min(ipm))	
172 (10.5)	750	84 (3.3)	
Tap Carbon steel (SM45C)			
Tool (mm)	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.

TOOL CHANGER | PALLET



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 drumshape ATC mounted on the right of the machine is interoperated with the CAM.

Tool change time (T-T-T)

1.3 s / 1.6 s option

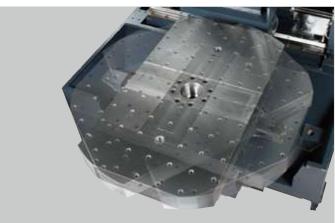
Tool change time (C-T-C)

4.3 s / 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	lodel VC 430	
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 x 19.3 inch)	2-860 × 570 mm (2-33.9 x 22.4 inch)

STANDARD | OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

Description	Features	VC 430	VC 510
ir blower		0	0
ir gun		0	0
	30 Tools	•	•
Auto tool changer	40 Tools	0	0
Coolant chiller		0	0
Coolant gun		0	0
Coolant tank		•	•
Coolant level switch: Sensing level - Low / High		0	0
Data server	NONE	•	•
rata sei vei	FUNCTION & MEMORY CARD_1GB	0	0
Electric cabinet air conditioner		0	0
Electric cabinet light		0	0
Electric cabinet line filter		0	0
Avdraulic fivture interface	NONE	•	•
Hydraulic fixture interface	A LINE_1 PAIR_EACH PALLET	0	0
1PG	1 MPG_PORTABLE TYPE	•	•
iro	1 MPG_PORTABLE_W/ENABLE TYPE	0	0
IC system	DN Solutions FANUC i	•	•
	6000 r/min	X	Х
Dil cooler	10000 r/min	•	•
	12000 r/min	•	•
Dil Skimmer	Belt type	0	0
	2_30-M16 X P2.0 TAP	•	Х
allet tune	2_4-100 X 18H8 T-SLOTS	0	Х
Pallet type	2_42-M16 X P2.0 TAP	X	•
	2_5-100 X 18H8 T-SLOTS	X	0
neumatic fixture interface	P/T LINE_1 PAIR_EACH PALLET	•	•
meumatic fixture interface	A/B LINE_1 PAIR_EACH PALLET	0	0
Power transformer		0	0
ligid tapping		•	•
Shower coolant	NONE	•	•
mower coolant	1.1 kW_0.1MPA_200L/MIN_220V	0	0
pindle motor power	15/11 kW	X	0
philate motor power	18.5/15 kW	•	•
	6000 r/min	X	0
Spindle speed	10000 r/min	•	•
	12000 r/min	0	0
est bar		0	0
	NONE	•	•
hrough spindle coolant	1.5 KW_2.0 MPA	0	0
mough spinute coolant	4.0 KW_2.0 MPA	0	0
	5.5 KW_7.0 MPA_DUAL BAG FILTER	0	0
Nork & tool counter	WORK / TOOL	0	0
tustamized Coosial Cation	COOLANT SYSTEM - HIGH PRESSURE TSC1	0	0
Customized Special Option	APPLY GREASE LUBRICATION	0	0

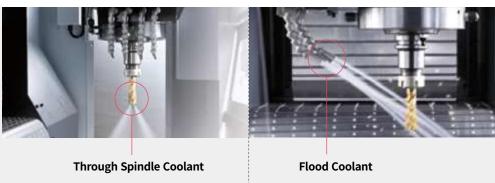
^{*} Please contact DN Solutions for detailed specification information.

[●] Standard ○ Optional X Not applicable

PERIPHERAL EQUIPMENT

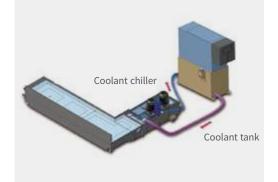
Through-spindle coolant spray system option

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.



Coolant chiller option (strongly recommended)

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	130kg (286.6lb)	
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	250kg	350mm (13.8inch)
400 x 400 (15.7x15.7) or ø 450 (17.7)	mm (inch)	6	(551.1lb)	(15.0111011)
500 x 500 (19.7x19.7) or ø 550 (21.7)	mm (inch)	4		

Pallet Storage-Table Configuration











Unit: mm (inch)

W X H = 1,900 X 1,700

250 (9.8) X 250 (9.8) 320 (12.6) X 320 (12.6) 350 (13.8) X 350 (13.8) 400 (15.7) X 400 (15.7) 500 (19.7) X 500 (19.7)

Interface for additional equipment (4 axes)

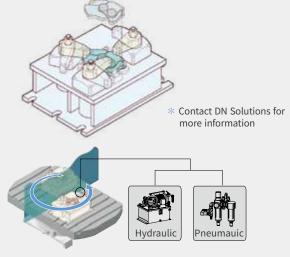
Fixure check list(for hydraulic / pneumatic Fixures)

- · Pressure source □ P/T Hydraulic □ A/B Pneumatic \square 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 : \square User \square DN Solutions
 - ☐ Use DN Solutions standard unit 24L / min, 4.9 MPa
 - ☐ Special requirement _____ L / min, _____MPa

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)



DN SOLUTIONS FANUC i PLUS

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

15 inch screen + new operation panel

DN Solutions 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.

DN Solutions Fanuc i Plus

- 15 inch color display

USB & PCMCIA card QWERTY keyboard

- EZ-guide i standardErgonimic operator panel2MB Memory



iHMI touchscreen option

iHMI provides an intuitive interface that uses a touchscreen for quick and easy operation.

Range of applications

Providing various applications related to planning, machining, improvement and utility, for customer convenience.



NUMERIC CONTROL SPECIFICATIONS

FANUC

Item		Specifications	DN Solutions Fanuc i (0i PLUS) VC430/VC510	
	Controlled axes		3 (X,Y,Z)	
Controlled axis	Simultaneously controlled axes		4 axes	
	Additional controlled Axis	Add 1 Axis (5th Axis)	•	
	Fast data server		0	
Data inmut/autmut	Memory card input/output		•	
Data input/output	USB memory input/output		•	
	Large capacity memory(2GB)*2	Available Option only with 15" Touch LCD (iHMI Only) *2)	0	
	Embedded Ethernet		•	
Interface function	Fast Ethernet		0	
	Enhanced Embedded Ethernet function		•	
	DNC operation	Included in RS232C interface.	•	
Operation	DNC operation with memory card		•	
	Workpiece coordinate system	G52 - G59	•	
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	•	
Program input	Tool number command	(15 pane)	T4 digits	
	Tilted working plane indexing command	G68.2 TWP	X	
	Al contour control I	G5.1 Q , 40 Blocks	X	
	Al contour control II	G5.1 Q_, 200 Blocks	•	
Feed function	Al contour control II	G5.1 Q , 600 Blocks	X	
	Al contour control II	G5.1 Q , 1000 Blocks *1)	X	
	High smooth TCP	2012 (2), 1000 2100110 1)	X	
	EZ Guidei (Conversational Programming Solution)		•	
Operation guidance	iHMI with Machining Cycle	Only with 15" Touch LCD standard *2)	X	
function	EZ Operation package	only with 15 Touch Lob standard 2/	<u> </u>	
Setting and display	CNC screen dual display function		•	
	FANUC MTConnect		•	
Network	FANUC OPC UA		0	
	17111000101071	10.4" color LCD	X	
	Display unit	15" color LCD	X	
Others	Display unit	15" color LCD with Touch Panel		
		640M(256KB)_500 programs	X	
		1280M(512KB) 1000 programs	X	
		2560M(1MB)_1000 programs	X	
		5120M(2MB)_1000 programs	^	
	Part program storage size & Number of	10240M(4MB)_1000 programs	X	
	registerable programs	20480M(8MB)_1000 programs		
	registerable programs	2560M(1MB)_2000 programs	X	
		5120M(2MB)_4000 programs	X	
		10240M(4MB)_4000 programs	X	
		20480M(8MB)_4000 programs	X	

EZ WORK

The software developed by DN Solutions's own technology provides numerous functions designed for convenient operation.

EZ work

The EZ work package delivers speed and efficiency. This menu-driven innovation not only helps customers reduce setup times, but also simplifies common tasks and procedures, reducing the potential for errors. EZ work reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.



Thermal Compensation

A function to maintain high-precision machining quality by analyzing and correcting the amount of thermal displacement of a structure through a temperature sensor



Operation Rate

Machine operation history management function by date based on load



M/G-Code List

Functional description of M code and G code



Adaptive Feed Control

Function to control feedrate so that the cutting can be carried out at a constant load



Tool Management

Function to manage tool information [Tool information / Tool No. / Tool condition (normal, large diameter, worn / damaged, used for the rst time, manual) / Tool name]



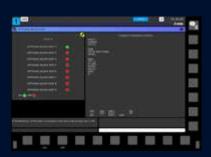
Spindle Warm Up

A function that assists spindle warm-up for spindle life when the spindle has not been used for a certain period of time



ATC Recovery

Function to view detailed info with recommended actions and to perform step-by-step operation manually (when an alarm is triggered during an ATC operation)



Addition of Optional Block Skip

In addition to the OPTIONAL BLOCK SKIP of the operation panel, the function to skip a specific block selected in the machining program

POWER | TORQUE

VC 430 / VC 510

High speed spindle

Max. spindle speed: 10000 r/min

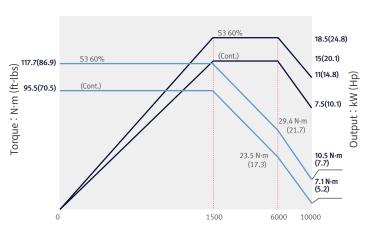
Spindle motor power: 18.5 / 15 kW

24.8 / 20.1 Hp

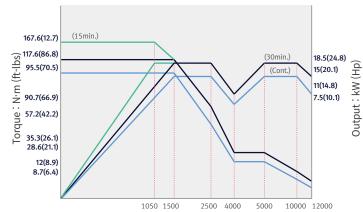
Max. spindle speed: **12000** r/min

Spindle motor power: 18.5 / 15 kW option

24.8 / 20.1 Hp



Spindle speed: r/min



Spindle speed: r/min

High torque spindle

Max. spindle speed: 6000 r/min

Spindle motor power: 15 / 11 kW option

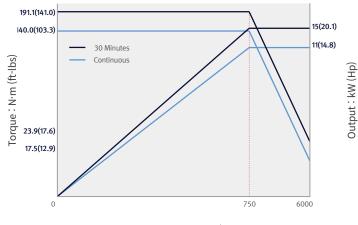
20.1 / 14.8 Hp

(Only VC 510)

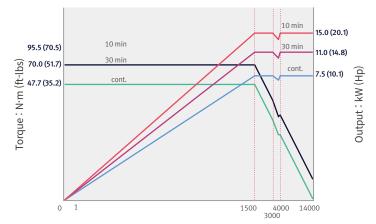
Max. spindle speed: **14000** r/min

Spindle motor power: 15 / 11 kW option

20.1 / 14.8 Hp



Spindle speed: r/min

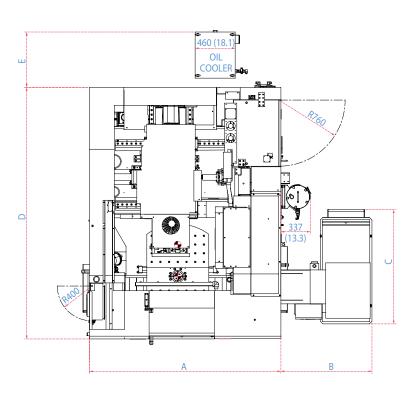


Spindle speed: r/min

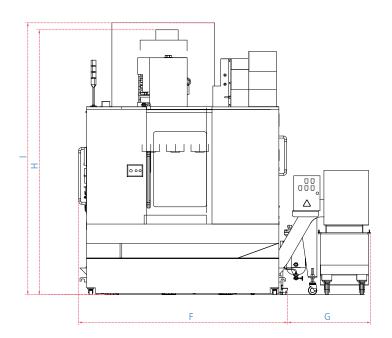
DIMENSIONS

VC 430 / VC 510

Units : mm (inch)



TOP



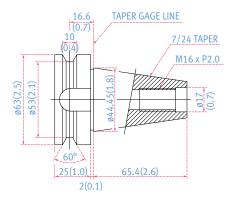
FRONT

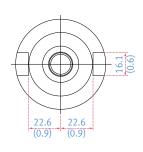
							_	_	_ н	1	1
Item	Unit	A	В	С	D	E	F	G	Belt type	Direct type	With top cover
VC 430	mm	2200 (86.6)	1046 (41.2)	1312 (51.7)	2890 (113.8)	637 (25.1)	2391 (94.1)	946 (37.2)	2738 (107.8)	3030 (119.3)	3110 (122.4)
VC 510	(inch)	2580 (101.6)	1100 (43.3)	1312 (31.1)	3260 (128.3)	590 (23.2)	2580 (101.6)	1100 (43.3)	2830 (111.4)	3130 (123.2)	3250 (128.0)

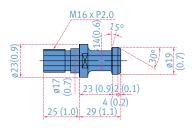
 $^{{\}it *Some peripheral equipment can be placed in other places}$

TOOL SHANK

BT Units: mm (inch)





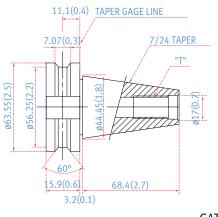


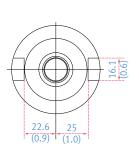
MAS403 BT 40

NiKKEN PS-806 (with TSC)

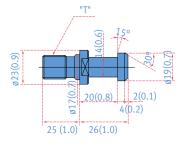
CAT option

Units : mm (inch)





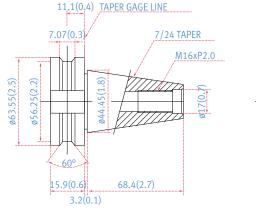
CAT 40

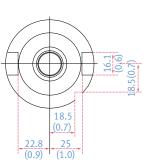


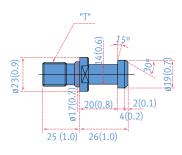
DIN 69872#40 (with TSC)

Option

Units : mm (inch)





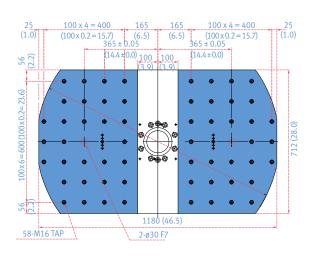


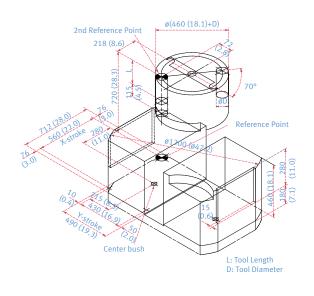
DIN 69871-A40

DIN 69872#40 (with TSC)

PALLET DIMENSIONS

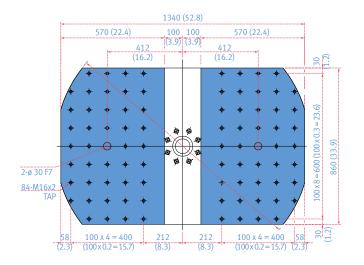
VC 430
Units: mm (inch)

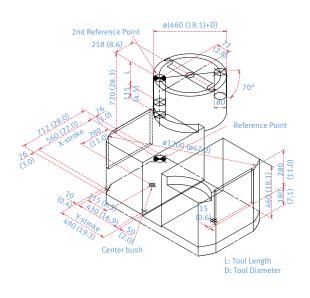




^{*} If the size of the workpiece is larger than the indicated limit, it may collide with the column, ATC, splash guard, etc.

VC 510
Units: 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)	
ravels	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)	
eedrate	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	
pindle	Max. spindle speed	r/min	10000 {12000, 14000}*	10000 {6000, 12000, 14000}*	
	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	
utomatic	Type of tool shank	-	MAS403 BT40		
ool changer	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 (tool-to-tool)	S	60Hz {50Hz}*∶1.3 {1.6}*		
	Tool change time (chip-to-chip)	S			
utomatic	Number of pallet	ea		2	
allet changer	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	
ank	Coolant tank capacity	L (galon)	300 (79.3)	420 (111.0)	
apacity	Lubrication tank capacity (available)	L (galon)	2	(0.5)	
1achine	Height	mm (inch)	3030 (119.3)	3130 (123.2)	
imensions	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		DN Solution	s Fanuc i Plus	



The DN Solutions promise, MACHINE GREATNESS, has two important meanings. The first is simple: DN Solutions makes great machines. The second is a challenge to our end-users. With a product line that is this comprehensive, accurate and reliable, we equip our customers to machine greatness. The big question: *Why should you choose DN Solutions over other options?*

Here's why…



WHAT YOU MAKE AND HOW YOU MAKE IT MATTERS—SO MAKE IT GREAT WITH DN SOLUTIONS.

UNBEATABLE MACHINES

You won't find a more comprehensive range or a better combination of value, performance and reliability anywhere else.

ROBUST PRODUCT LINE

We offer an impressive range of machine models and hundreds of configurations. Whatever your machining needs and requirements, there's a DN Solutions for you.

READILY AVAILABLE - ANYWHERE IN THE WORLD

Machining centres (including 5-axis machines), lathes, multi-tasking turning centres and mill-turn machines, and horizontal borers with best-in-class specifications are all available…ready to install.

EXPERT SERVICE

Our dedicated, experienced and knowledgeable team is totally committed to improving your productivity, growth and success.

CUSTOMER SUPPORT AND SERVICES

We're there for you whenever you need us.

We help our customers operate at maximum efficiency by providing them with a range of tried, tested and trusted services - from pre-sales consultancy to post-sales support.



FIELD SERVICES

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

PARTS SUPPLY

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



TRAINING

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

TECHNICAL SUPPORT

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

RESPONDING TO CUSTOMERS ANYTIME, ANYWHERE

DN Solutions Global Network

DN Solutions provides systems-based professional support services, before and after the machine tool sale, by responding quickly and efficiently to customers. By supplying spare parts, product training, field service and technical support, we provide the expert care, attention and assistance our customers expect from a market leader.



Global sales and service support network

4	Corporations	
156	Dealer networks	
51	Technical centers Technical Center, Sales Support, Service Support, Parts Support	
200	Service posts	
3	Factories	





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^{*} Specifications and information contained within this catalogue may be changed without prior notice.



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