DN SOLUTIONS

HIGH PRODUCTIVITY TWIN TABLE VERTICAL MACHINING CENTER

VC 430 ·510

VC 430
VC 510





VC 430·510

The VC430 / VC 510 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.

CONTENTS

Product Overview

Basic Information

04 BASIC STRUCTURE
05 SPINDLE
06 TOOL CHANGER | PALLET

Detailed Information

07 STANDARD | OPTIONAL SPECIFICATIONS
08 PERIPHERAL EQUIPMENT
09 DN SOLUTIONS FANUC i PLUS
10 EZ work
11 POWER | TORQUE
12 DIMENSIONS
13 TOOL SHANK
14 Pallet DIMENSIONS
15 Machine Specifications

Customer Support Service



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

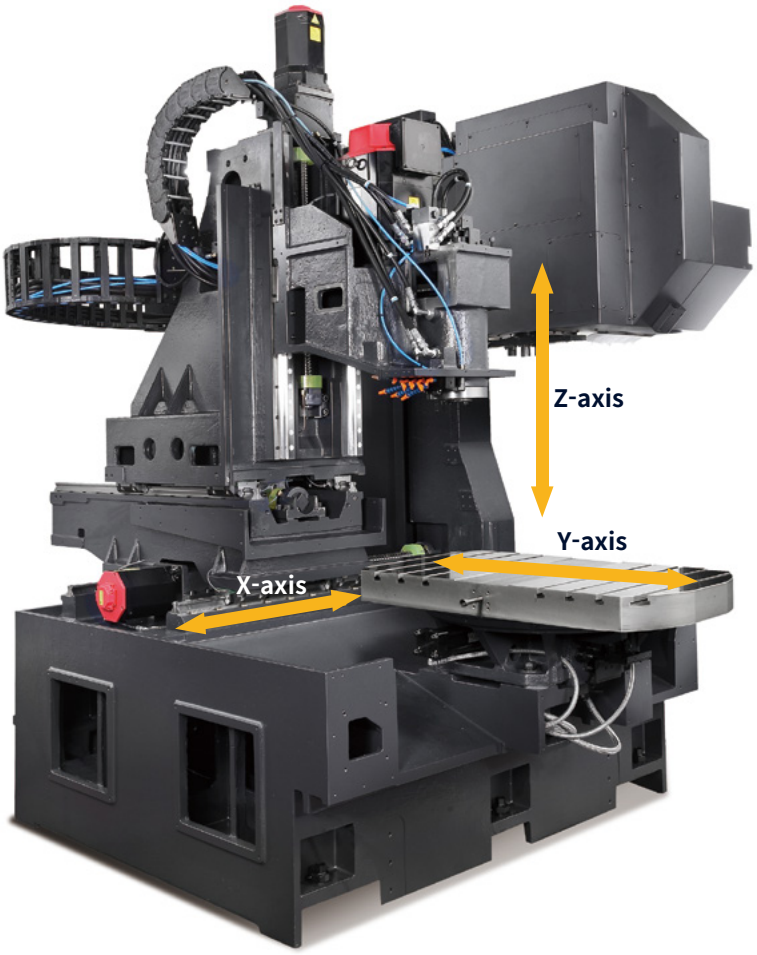
560 / 430 / 570 mm

(22.0 / 16.9 / 22.4 inch)

VC 510

762 / 516 / 570 mm

(33.0 / 20.3 / 22.4 inch)



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.

Rapid traverse rate (X / Y / Z axis)

VC 430

40 / 40 / 36 m/min

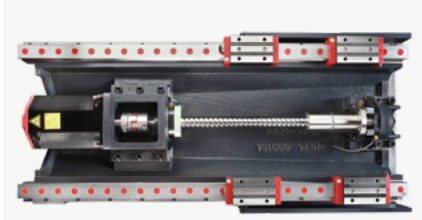
(1574.8 / 1574.8 / 1417.3 ipm)

VC 510

40 / 40 / 32 m/min

(1574.8 / 1574.8 / 1259.8 ipm)

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.

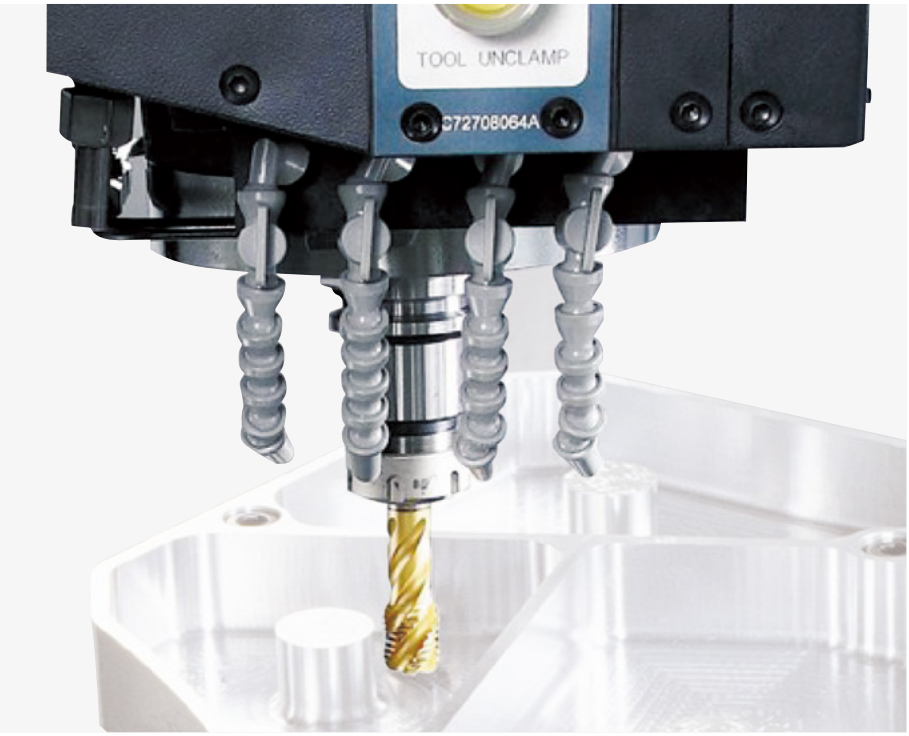
High-speed, high-precision spindle

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



High speed spindle

10000 r/min

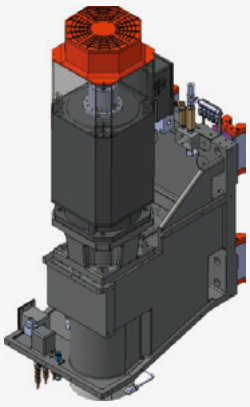
** Belt type*

12000 r/min OPTION

** Direct type*

Motor power (30min/con.)

18.5 / 15 N·m
(24.8 / 20.1 Hp)



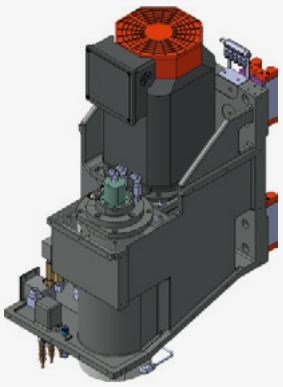
High torque pindle

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*

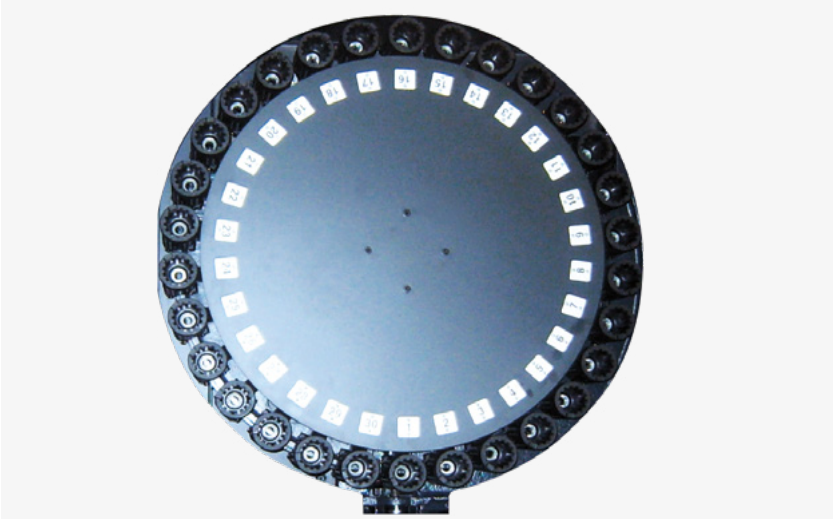
TOOL CHANGER | PALLET

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 drum-shape ATC mounted on the right of the machine is interoperated with the CAM.

Tool change time (T-T-T)

1.3 s (60Hz)
1.6 s (50Hz)

Tool change time (C-T-C)

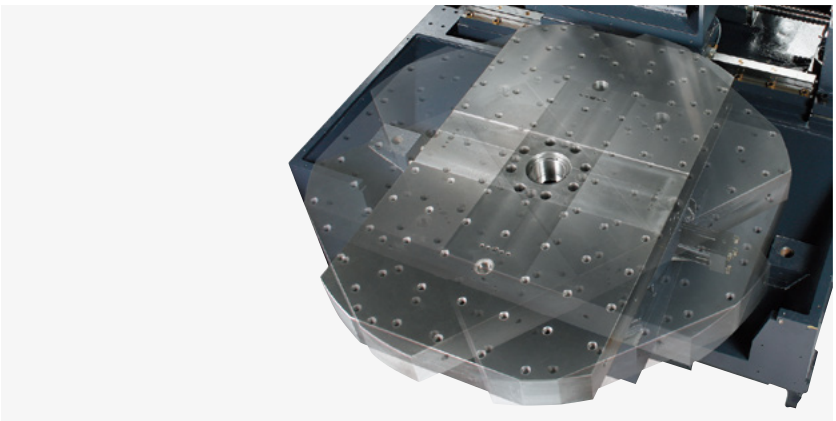
4.3 s (60Hz)
4.6 s (50Hz)



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 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
Electric cabinet light		○	○
Electric cabinet line filter		○	○
Electric cabinet air conditioner		○	○
Hydraulic fixture interface	NONE	●	●
	A/B LINE_1 PAIR_EACH PALLET	○	○
Data server	NONE	●	●
	FUNCTION & MEMORY CARD_1GB	○	○
Rigid tapping		●	●
Shower coolant	NONE	●	●
	SHOWER COOLANT	○	○
Bed flushing coolant	NONE	●	●
	BED FLUSHING COOLANT	○	○
Through spindle coolant	NONE	●	●
	1.5 KW_2.0 MPA	○	○
	4.0 KW_2.0 MPA	○	○
	2.9 KW_3.0MPA_CYCLONE FILTER	○	○
	7.5 KW_7.0MPA_CYCLONE FILTER	○	○
Oil cooler	6000 r/min	X	X
	10000 r/min	●	●
	12000 r/min	●	●
	15000 r/min	●	●
Spindle motor power	15/11 kW	X	○
	18.5/15 kW	●	●
	18.5/11 kW	○	○
Spindle speed	6000 r/min	X	○
	10000 r/min	●	●
	12000 r/min	○	○
	15000 r/min	○	○
Air gun		○	○
Air blower		○	○
Oil Skimmer	Belt type	○	○
Pneumatic fixture interface	P/T LINE_1 PAIR_EACH PALLET	●	●
	A/B LINE_1 PAIR_EACH PALLET	○	○
Auto tool changer	30 Tools	●	●
	40 Tools	○	○
Coolant tank		●	●
Counter function	WORK / TOOL	○	○
Coolant gun		○	○
Water soluble Coolant Chiller**		○	○
Coolant level switch	Sensing level - Low / Hig	○	○
Test bar		○	○
Power transformer		○	○
Pallet type	29-M16 X P2.0 TAP	●	X
	2_4-100 X 18H8 T-SLOTS	○	X
	2_42-M16 X P2.0 TAP	X	●
	2_5-100 X 18H8 T-SLOTS	X	○
NC system	DN Solutions FANUC i	●	●
MPG	1 MPG_PORTABLE TYPE	●	●
	1 MPG_PORTABLE_W/ENABLE TYPE	○	○
Customized Special Option	APPLY GREASE LUBRICATION	○	○

※ Please contact DN Solutions for detailed specification information.
**When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.*
*** Technical consultation is mandatory for the chilling of non-water soluble coolant*

● *Standard* ○ *Optional* *X Not applicable*

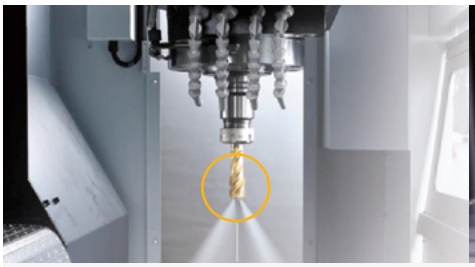
Fire Safety Precautions | There is a high risk of fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting the controlled and careful use of coolants and modifying the machine without the consent of the manufacturer. Always check the SAFETY GUIDELINES carefully before using the machine.

PERIPHERAL EQUIPMENT

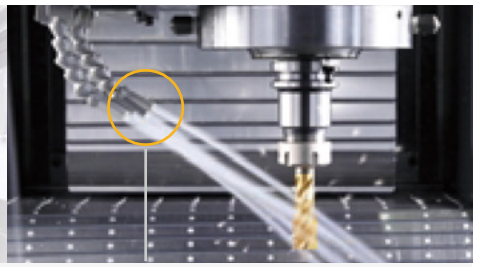
Through-spindle coolant spray system

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.



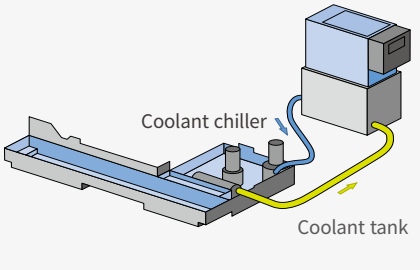
Through Spindle Coolant



Flood Coolant

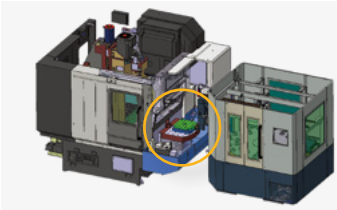
Coolant chiller OPTION (strongly recommended)

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.

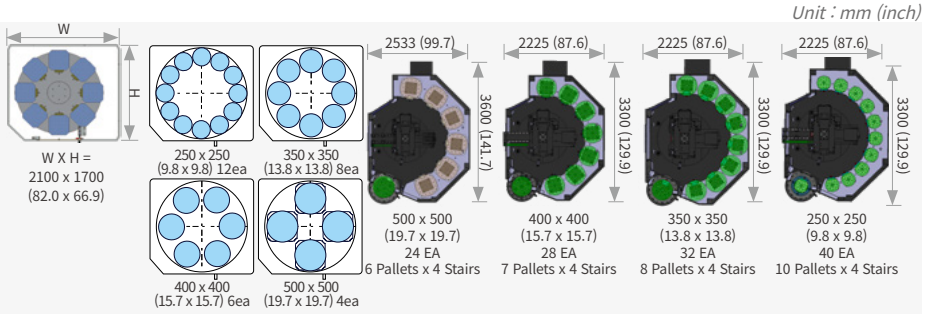


** The VC430 AWC-6PALLET has some limitations and requires consultation with DN Solutions.*
*** The VC430 AWC-4PALLET cannot be installed due to exceeding the table size and stroke.*
**** The VC510 AWC-4PALLET has some limitations and requires consultation with DN Solutions.*

Pallet Storage-Table Configuration

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)	350mm (13.8inch)
320 x 320 (12.6x12.6) or ø 360 (14.2)	mm (inch)	10	300kg (661.4lb)	
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		

Unit : mm (inch)

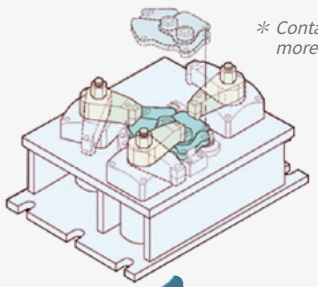


Interface for additional equipment (4 axes)

Fixure check list(for hydraulic / pneumatic Fixures)

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

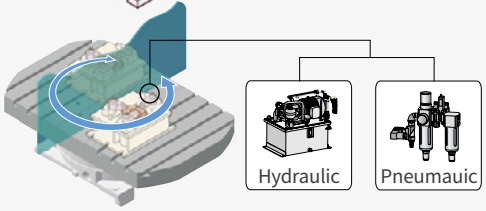
** Contact DN Solutions for more information*



Hydraulic fixture line

Pneumatic or hydraulic lines supply power from a central power pack to fixtures on each side of the indexing pal-

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
- Intuitive and user-friendly design

USB & PCMCIA card QWERTY keyboard

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

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

1) The number of look-ahead blocks may be changed or limited depending on the peripheral device or the configuration of the internal NC system.
2) Available Option only with Fanuc i plus iHMI

● Standard ○ Optional X N/A ✪ Available

EZ WORK

The software developed byDN 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.



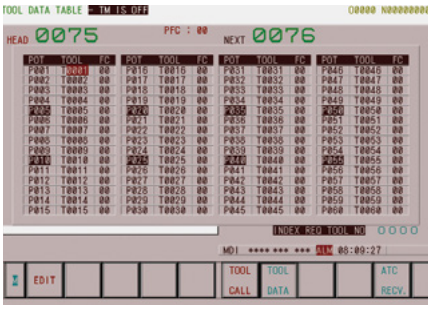
Thermal Compensation

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



M/G-Code List

Functional description of M code and G code



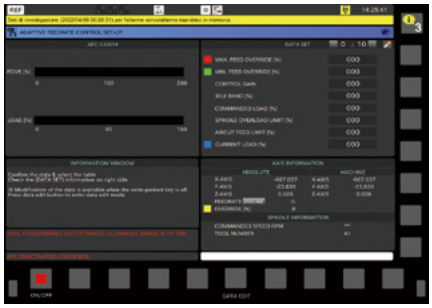
Tool Management

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



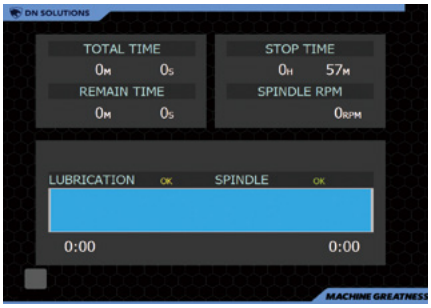
Operation Rate

Machine operation history management function by date based on load



Adaptive Feed Control

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



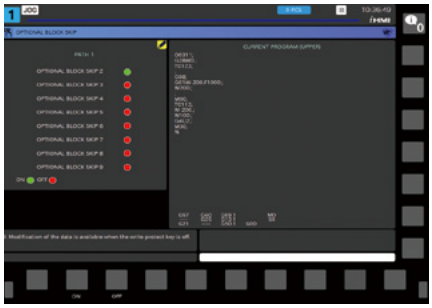
Spindle Warm Up

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

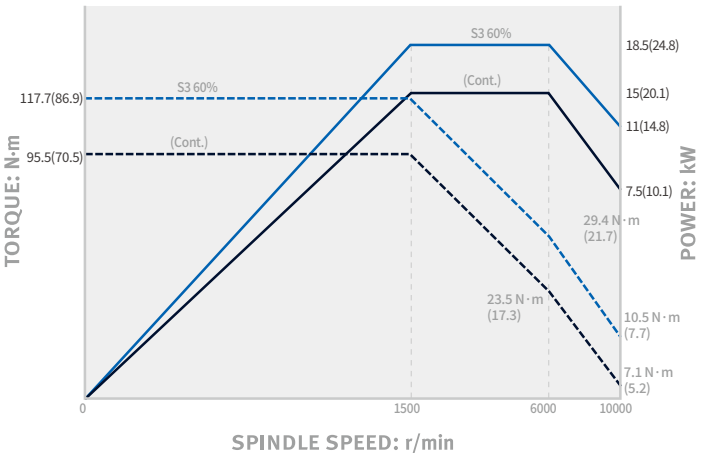
Max. spindle speed

10000 r/min

Spindle motor power

18.5 / 15 kW

(24.8 / 20.1 Hp)



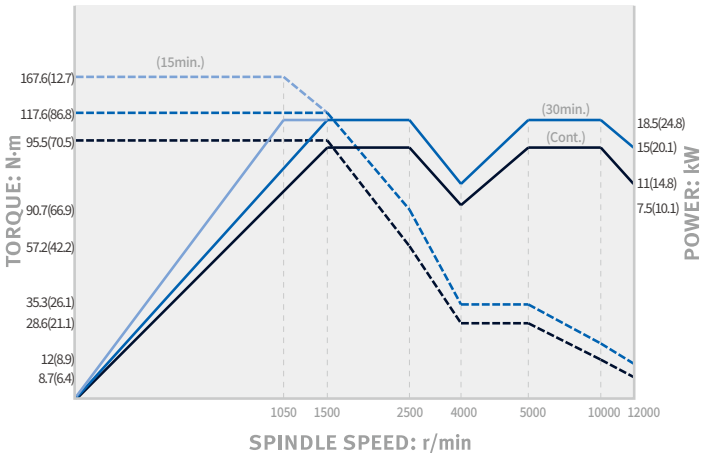
Max. spindle speed

12000 r/min OPTION

Spindle motor power

18.5 / 15 kW

(24.8 / 20.1 Hp)



High torque & High speed spindle

Max. spindle speed

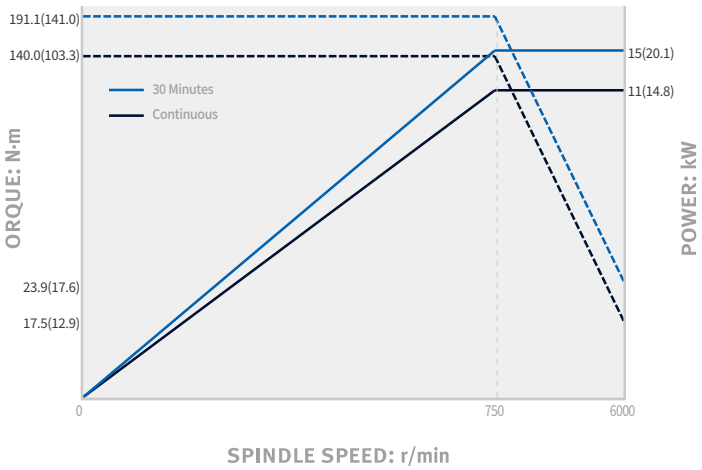
6000 r/min OPTION

Spindle motor power

15 / 11 kW

(20.1 / 14.8 Hp)

(Only VC 510)



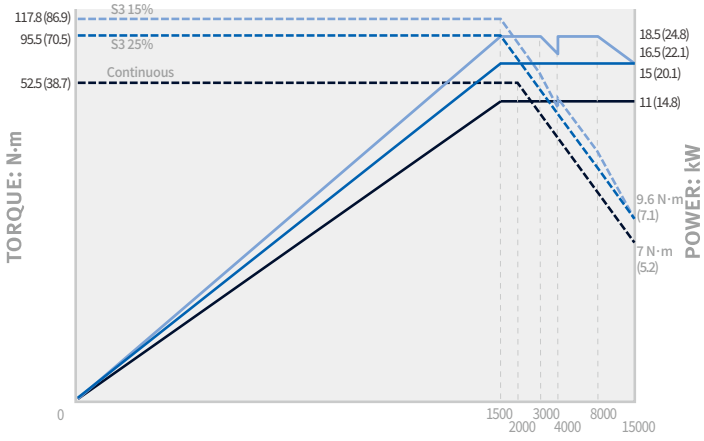
Max. spindle speed

15000 r/min OPTION

Spindle motor power

18.5 / 11 kW

(24.8 / 14.8 Hp)

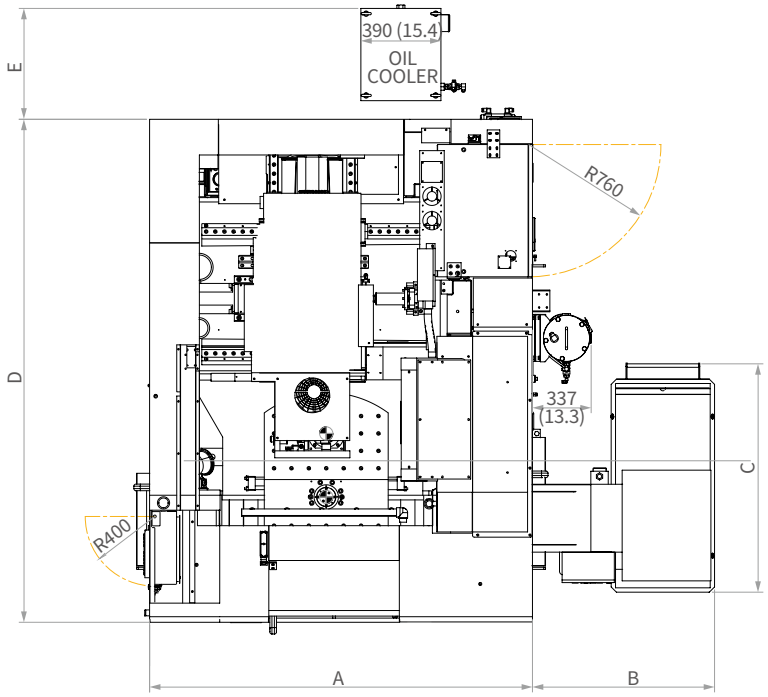


DIMENSIONS

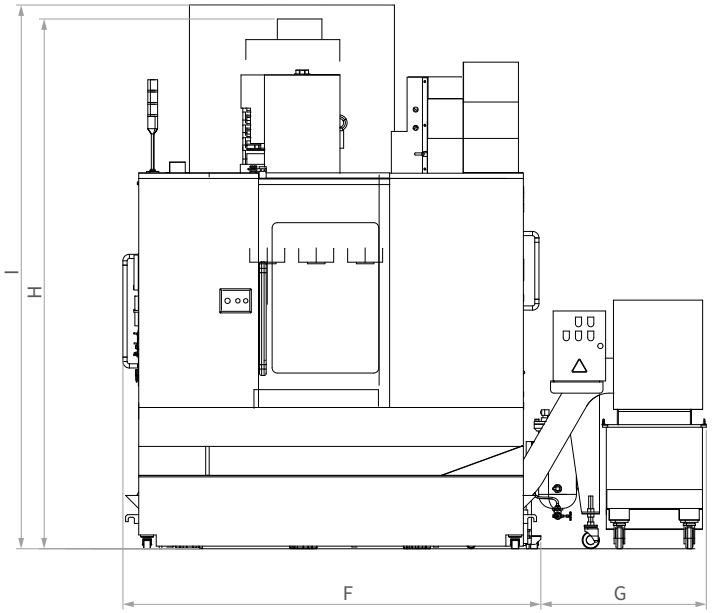
VC 430 / VC 510

TOP

Unit : mm (inch)



FRONT



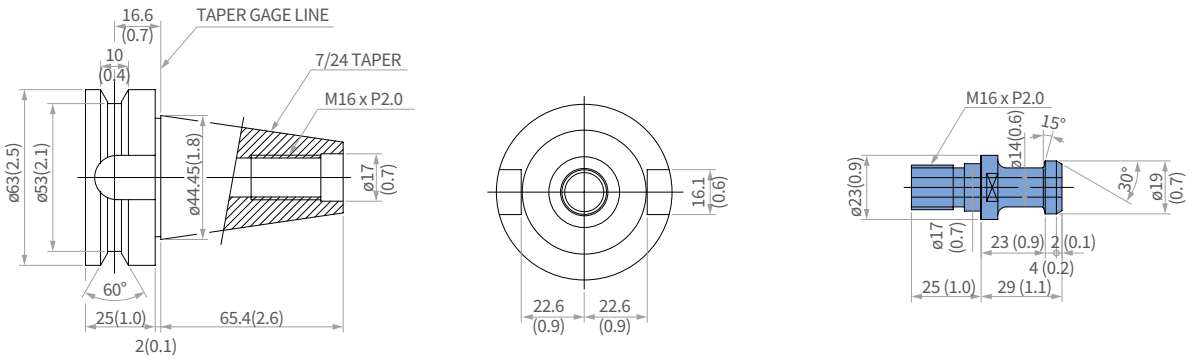
Item	Unit	A	B	C	D	E	F	G	H		I
									Belt type	Direct type	With top cover
VC 430	mm (inch)	2200 (86.6)	1100 (43.3)	1312 (51.7)	2890 (113.8)	600 (23.6)	2415 (95.1)	1000 (39.4)	2738 (107.8)	2963 (116.7)	3120 (122.8)
VC 510		2580 (101.6)			3260 (128.3)		2795 (110)		2940 (115.7)	3130 (123.2)	3250 (128.0)

** Some peripheral equipment can be placed in other places*

TOOL SHANK

BT OPTION

Unit : mm (inch)

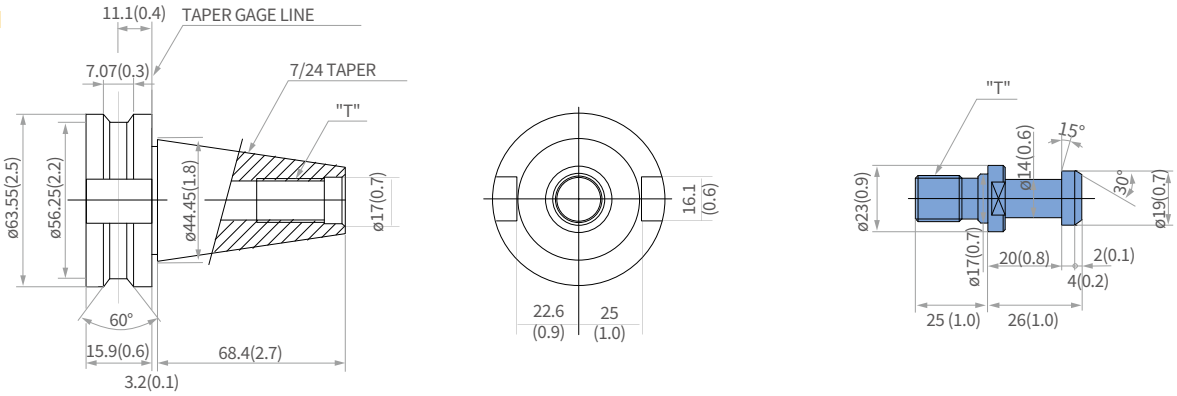


MAS403 BT 40

NiKKEN PS-806
(with TSC)

CAT OPTION

Unit : mm (inch)

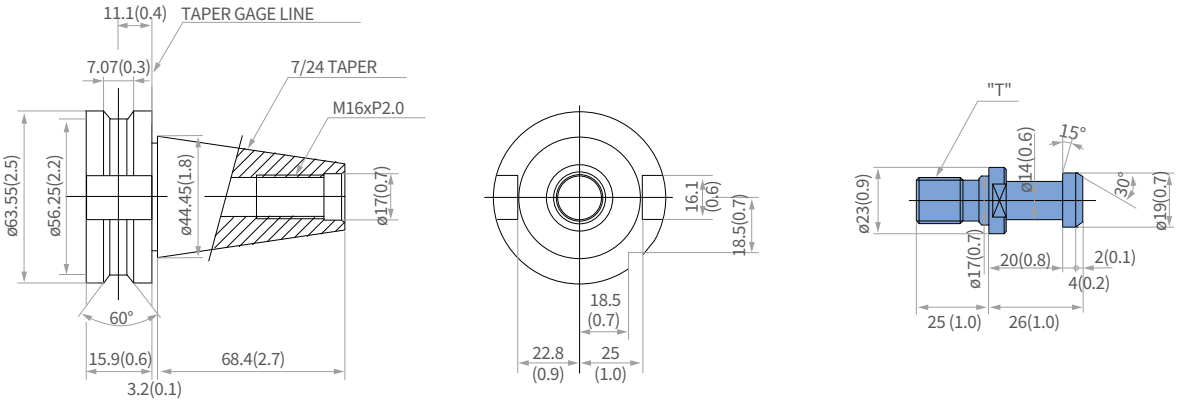


CAT 40

DIN 69872#40
(with TSC)

DIN OPTION

Unit : mm (inch)



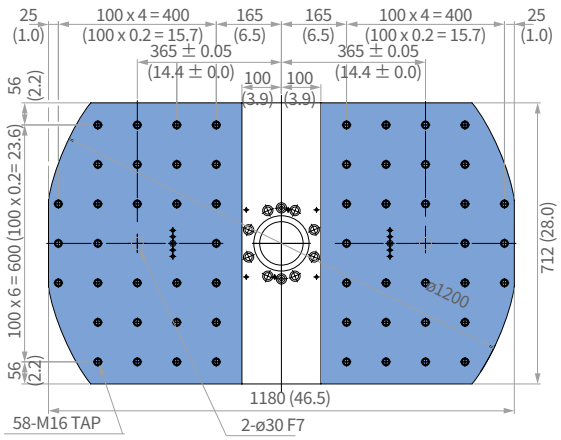
DIN 69871-A40

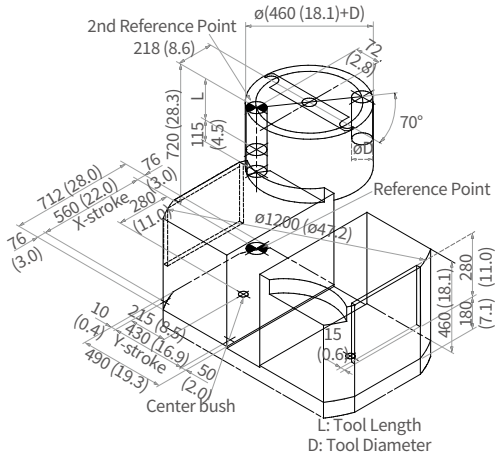
DIN 69872#40
(with TSC)

PALLET DIMENSIONS

VC 430

Unit : mm (inch)

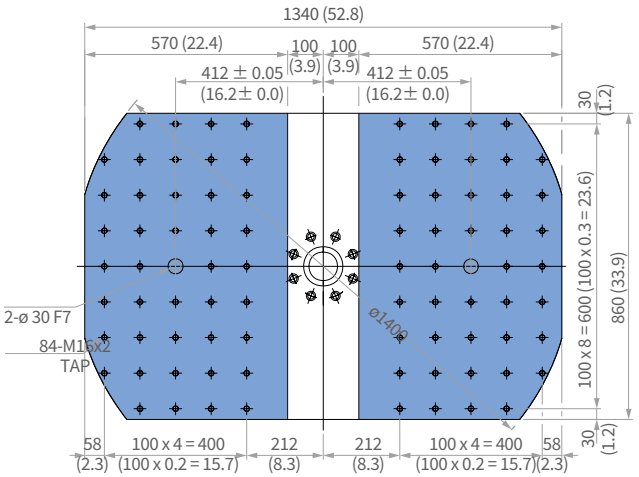


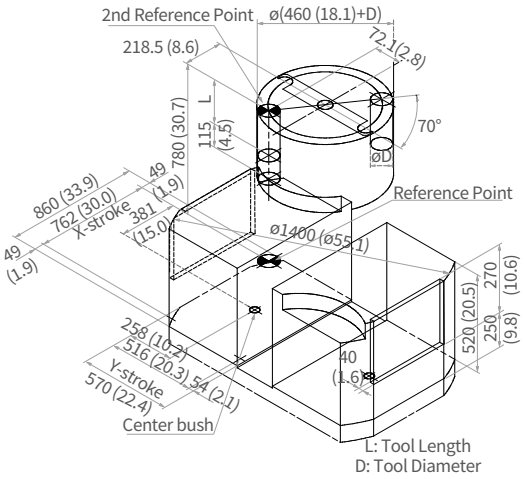


** If the size of the workpiece is larger than the indicated limit, it may collide with the column, ATC, splash guard, etc.*

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)
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	-	29-M16xP2.0 TAP	42-M16xP2.0 TAP
Spindle	Max. spindle speed	r/min	10000 {12000, 15000}*	10000 {6000, 12000, 15000}*
	Spindle taper	-	ISO #40 7/24 Taper	
	Max. spindle torque	N·m(ft-lbs)	117.7 {167.6, 117.8}* (86.9 {123.7, 86.9})	117.7 {191.1, 167.6, 117.8}* (86.9 {141.0, 123.7, 86.9})
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	kg (lb)	8 (17.6)	
	Max. tool moment	N·m(ft-lbs)	5.88 (4.3)	
	Tool change time (tool-to-tool)	s	1.3 (60Hz), 1.6 (50Hz)	
	Tool change time (chip-to-chip)	s	4.3 (60Hz), 4.6 (50Hz)	
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) (10000, 12000 r/min), 18.5/11 (24.8 / 14.8) (15000 r/min)	18.5/15 (24.8 / 20.1) (10000, 12000 r/min) 15/11 (20.1/ 14.8) (6000 r/min), 18.5/11 (24.8 / 14.8) (15000 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	40.3 (10000, 12000 r/min) 35.1 (15000 r/min)	40.3 (10000, 12000 r/min) 35.1 (6000, 15000 r/min)
	Compressed air supply	MPa	0.54	
Tank capacity	Coolant tank capacity	L (galon)	300 (79.3)	420 (111.0)
	Lubrication tank capacity (available)	L (galon)	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)	2580 (101.6)
	Weight	kg (lb)	7800 (17195.8)	9200 (20282.2)
Control	NC system		DN Solutions Fanuc i Plus	

* { } : Optional

(1) This value is the maximum for the height of rectangular without interference of ATC operating. (2) Available with pallet change. (3) Avaliable in tool magazine.

DN SOLUTIONS

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** For more details, please contact DN Solutions.*
** Specifications and information contained within this catalogue may be changed without prior notice.*

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