DOOSAN

DVF 5000

Compact, Simultaneous 5-Axis Machine for High-Speed Multitasking

MACHINE GREATNESS™

DVF 5000

The new Doosan DVF 5000 5 axis machining center provides world class productivity and reliability for simultaneous 5 axis machining operations. It's stable structure and compact footprint is ideal for production of small to medium size workpieces with complex shapes. The DVF5000 also includes an eco-friendly all-grease lubrication system.

Contents

High productivity & speed Simultaneous 5-Axis Machine

- 12000 / 18000 r/min high speed spindle
- Ø500 mm (19.7 inch) 2-axis tilting table (option : Ø630mm (Ø24.8 inch))
  - Max. workpiece weight 400kg (881.8 lb)

User friendly machine

- Compact footprint
- Grease lubrication system
- Easy operator access to machine
- Compact automation system (AWC)

High precision function

- Spindle & Structure Thermal Compensation
- Spindle Cooling Standard (Option : ballscrew shaft cooling system)

Machine configuration

Provides high rigidity and easy operator access.

Travel distance

X axis **625** mm (24.6 inch)

Y axis **450** mm (17.7 inch)

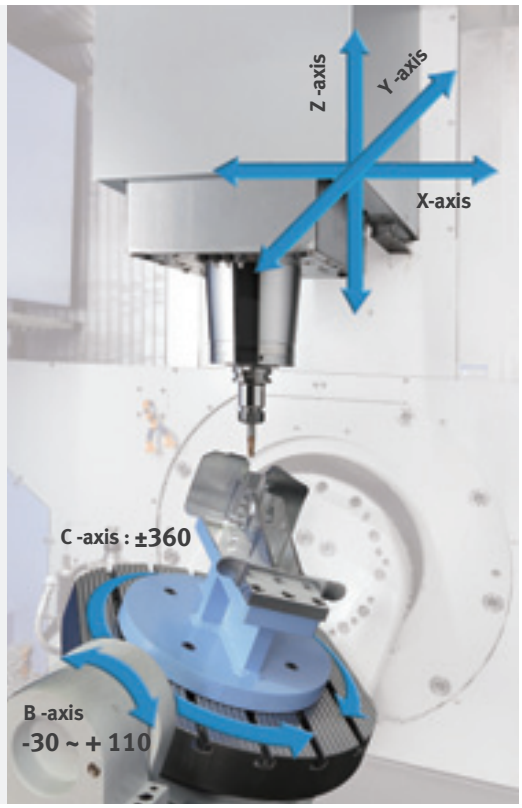
Z axis **400** mm (15.7 inch)

Rapid traverse

X axis **40** m/min (1574.8 ipm)

Y axis **40** m/min (1574.8 ipm)

Z axis **40** m/min (1574.8 ipm)



Spindle

We provide stable machining performance with high speed direct and built-in spindle.

Max. spindle speed

12000 r/min / **18000** r/min option

Max. spindle motor power & torque

Fanuc

18.5 kW / **118** N·m (24.8 Hp / 87.1 ft-lbs)

22 kW / **118** N·m option (29.5 Hp / 87.1 ft-lbs)

HEIDENHAIN

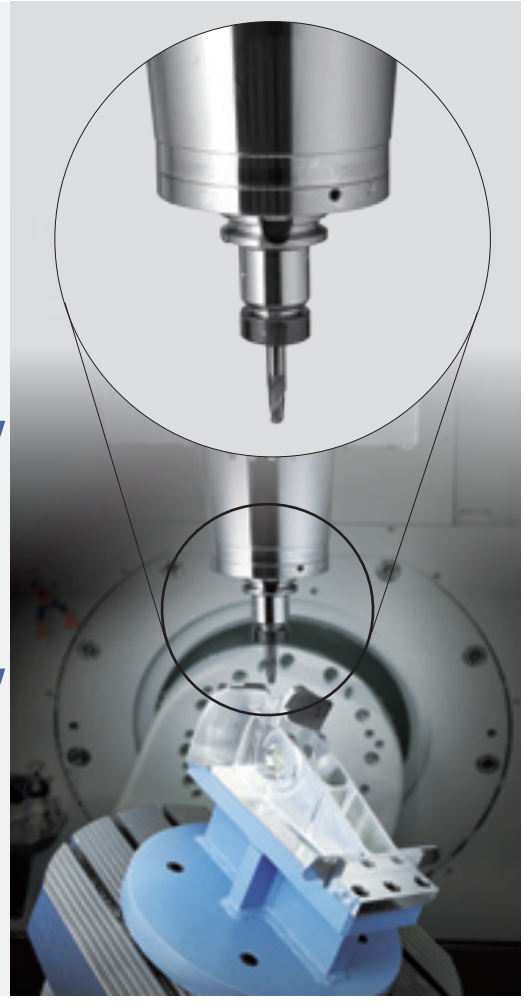
17 kW / **109** N·m (22.8 Hp / 80.4 ft-lbs)

30 kW / **155** N·m option (40.2 Hp / 114.4 ft-lbs)

SIEMENS

16.5 kW / **79** N·m (22.1 Hp / 58.3 ft-lbs)

30 kW / **155** N·m option (40.2 Hp / 114.4 ft-lbs)



Tool Magazine

Servo tool magazine as standard for high productivity and reliability.

Servo Magazine

30 ea

(40/60/90/120 ea) option

Tool to Tool

1.3 sec

ATC Magazine Panel

- **More than 60 tools,**
  - Touch panel 7 inch (FANUC, SIEMENS)
  - Touch panel 7.5 inch (SIEMENS)
  - Touch panel 10.2 inch (FANUC, HEIDENHAIN) option

Table

Provides stable machining performance with a wide machining area and trunnion support option.

Table size

ø 500 x 450 mm

(ø 19.7 x 17.7 inch)

ø 630 x 450 mm option

(ø 24.8 x 17.7 inch)

Max. workpiece size

ø 550 x h 450 mm

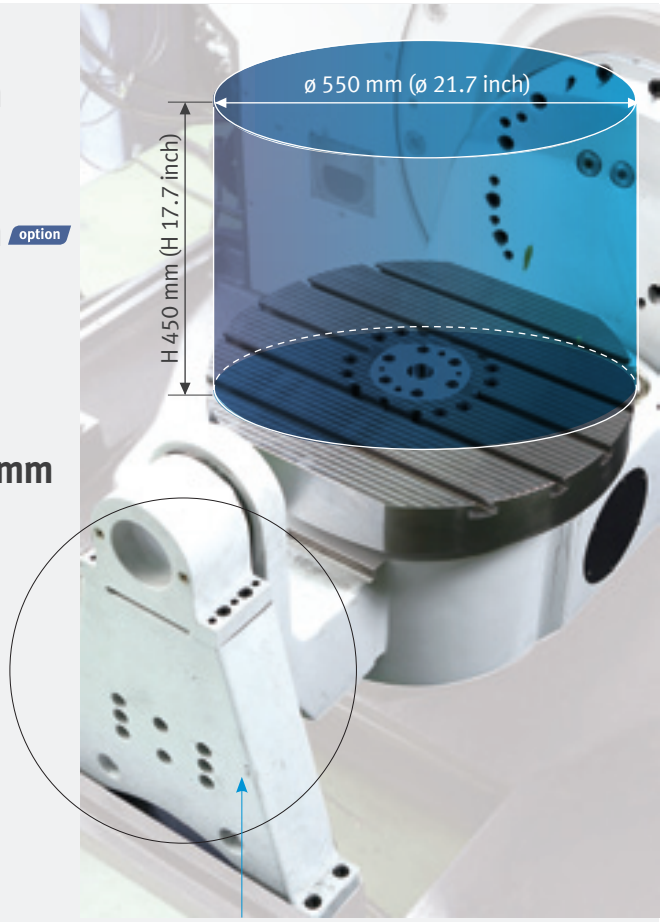
(ø 21.7 x 17.7 inch)

Max. Work load

400 kg

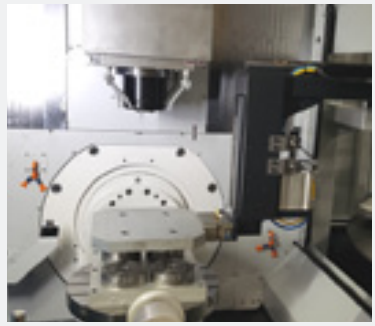
(881.8 lb)

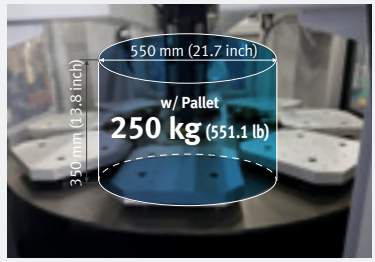
(with trunnion support)



AWC

Optimized solution with compact automation.

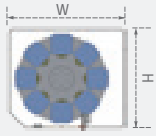




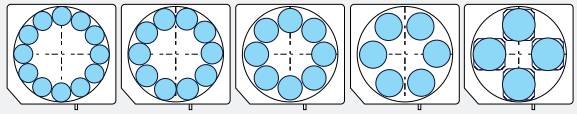
Max. workpiece dimensions	Unit	Count	Max. loading	Max. construction height on the pallet
250 x 250 (9.8x9.8) or ø 300 (11.8)	mm (inch)	12	130kg (286.6lb)	350mm (13.8inch)
320 x 320 (12.6x12.6) or ø 360 (14.2)	mm (inch)	10	250kg (551.1lb)	
350 x 350 (13.8x13.8) or ø 400 (15.7)	mm (inch)	8		
400 x 400 (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

Unit : mm (inch)



W X H = 1,900 X 1,700 (74.8 X 66.9)

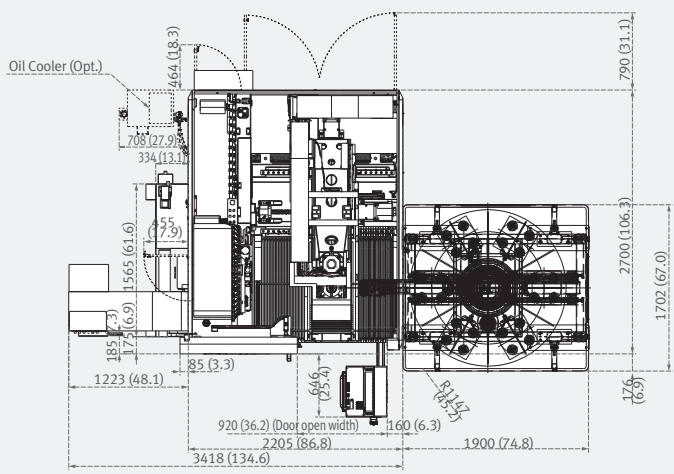


250 X 250 (9.8 X 9.8) | 320 X 320 (12.6 X 12.6) | 350 X 350 (13.8 X 13.8) | 400 X 400 (15.7 X 15.7) | 500 X 500 (19.7 X 19.7)

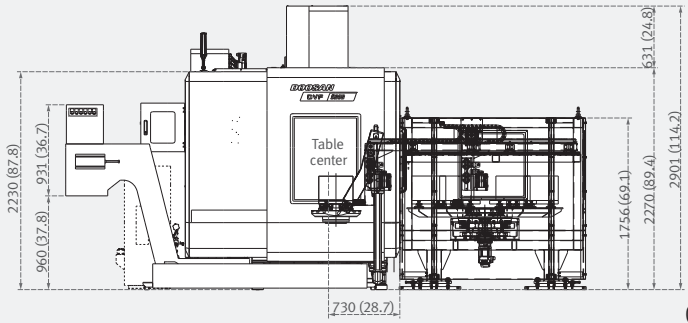
External Dimensions

Unit: mm (inch)

Top View



Front View



(1:20 rate)

Cutting Performance

From high speed machining to heavy duty cutting, diverse machining operations are possible for a wide variety of complex workpiece shapes.

Machining Performance

Max. chip throughput

Item	**Material** (SM45C)	**Condition**
Machining removal rate	599 cm^3/min (36.6 $inch^3$/min)	Ø80mm (3.15 in.) Face Mill (6Z)
feedrate	4680 mm/min (184.3 ipm)	
depth of cut	2 mm (0.1 inch)	

Item	**Material** (AL6061)	**Condition**
Machining removal rate	1814 cm^3/min (110.7 $inch^3$/min)	Ø80mm (3.15 in.) Face Mill (6Z)
feedrate	9450 mm/min (372.0 ipm)	
depth of cut	3 mm (0.1 inch)	

* 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 Examples

Item	Door Handle (Aerospace)	
Material	Aluminum	
Cycle time	3 hour 30 min	
Tool	Ø12 (0.5) x R2 Endmill	
Spindle speed	8000 r/min	
Feed rate	1800 mm/min (70.9 ipm)	

Ball Bar Measurement Test

Higher roundness accuracy is realized by the advanced design of machine structure and Doosan control system.

X-Y Plane

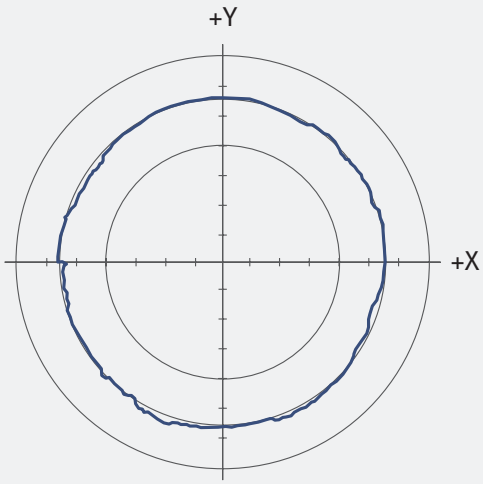
Roundness

3.8 μm

Feedrate

4000mm/min

(157.5 ipm)



Standard / Optional Specifications

Various optional features are available to satisfy customers' specific machining applications.

● Standard ○ Optional X Not applicable

NO.	Description	Features		DVF 5000
1	Spindle	12000 r/min		●
2		18000 r/min		○
3	Magazin	Tool storage capacity	30ea	●
4			40 / 60 / 90 / 120ea	○
5	Tool shank type	BIG PLUS BT40		●
6		CAT40 / DIN / HSK A63		○
7	Coolant	FLOOD	1.1 KW_0.7 MPA_30 L/MIN	●
8		TSC	None	●
9			1.5 KW_2.0 MPA_BUILT-IN FILTER	○
10			2.2 KW_3.0 MPA_BUILT-IN FILTER	○
11			3.7 KW_7.0 MPA_BUILT-IN FILTER	○
12		OIL SKIMMER	None	●
13			BELT TYPE	○
14		Coolant level switch : Sensing level - Low / High**		
15	Chip disposal	Chip conveyor	CHIP PAN	●
16			HINGED BELT_LEFT SIDE	○
17		Chip bucket	Folklift type	○
18			Rotation type	○
19		Air gun		○
20		Coolant gun		○
21	Precision machining options	Linear scale	X / Y / Z axis	○
22	Measurement & Automation	IKC READY	S/W ONLY	●
23			RENISHAW (RMI-Q) + S/W	○
24			HEIDENHAIN (SE660) + S/W	○
25			BLUM (RC66) + S/W	○
26		DATUM BALL FOR IKC	NONE	●
27			DATUM BALL_D25	○
28		TOUCH PROBE FOR IKC	NONE	●
29			RMP60_RENISHAW	○
30			TS460_HEIDENHAIN	○
31			TC60_BLUM	○
32		Automatic tool measurement	NONE	●
33			TS27R_RENISHAW	●
34			RTS_RENISHAW	○
35			NC4S_RENISHAW	○
36			TT160_HEIDENHAIN	○
37			ZX SPEED_BLUM	○
38		MASTER TOOL	NONE	●
39			MASTER TOOL	○
40	Others	LED Work light		●
41		3 Color signal tower		●
42		Tool load monitoring		●
43		EZ Guide i		○
44		Automatic power off		●
45	Customized special option	Front _ Auto door (w/safty edge)	-	○
46		Right side _ Auto door (w/safty edge)	-	○
47		Roof_ Auto door	-	○
48		15K Directed connected spindle	BT / CAT / DIN / HSK	○
49		Automatic workpiece changer	4 / 6 / 8 / 10 / 12 / 24	○
50		Rotary joint for table	Fixture line thru rotary table center (Max.HYD 4port & PNE 2port)	○
51		Paper filter with TSC	20 / 30 / 70 BAR	○
52		IKC(Intelligent Kinematic Compensation)	DCP-i	○
53			Kinematic OPT.	○

* Please contact DOOSAN to select detail specifications. ** Special Quotation.

Peripheral Equipment

Tool length measuring

Maximum workpiece limit

Automatic tool breakage detection (Touch type)

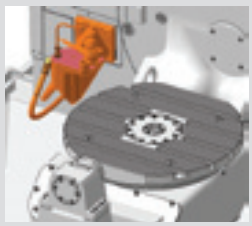
Ø550 x 240 mm (21.7 x 9.4 inch)

Automatic tool breakage detection (Laser type / Rotating touch type)

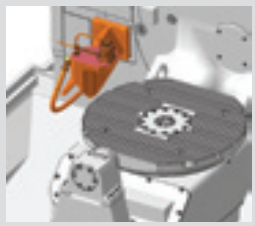
Ø550 x 450 mm (21.7 x 17.7 inch)

Limited use of Max workpiece

Renishaw(TS27R)

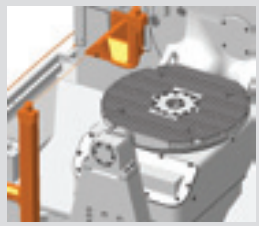


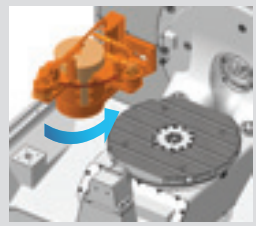
Heidenhain (TT160)



Blum (ZX Speed)

Non Limited use of Max workpiece





Renishaw(NC4S)

* When using Tool Length Measurement, contact Doosan for detailed capacity diagram

Intelligent Kinematic Compensation for 5-axis

For high accuracy 5 axis machining, Intelligent Kinematic Compensation function is recommended. This function minimizes error in complex 5 axis machining applications by maintaining the tool point in the correct position relative to the workpiece. In order to use this function, the following optional items are required.

Recommended optional items

1. Software

FANUC NC: DCP-i (Developed by DOOSAN)

Heidenhain NC: Kinematic opt

2. Receiver Recommended Option

3. Touch Probe Recommended Option

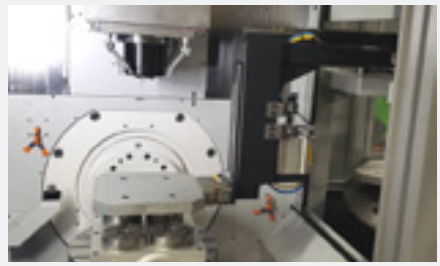
4. Datum ball Recommended Option

5. Automatic Tool Measurement Recommended Option

6. Master Tool Recommended Option

AWC system option

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



CUFOS

Customized User-friendly Flexible Operation Solutions

CUFOS is a PC based control system created by Doosan Machine Tools. Equipped with intuitive user-friendly functions such as a smart phone screen and easy customization, CUFOS helps to improve operational efficiency and performance for the user.

• Features of CUFOS

User-Friendly

- 19 inch Multi Touch Screen
- Multiple Apps such as –
  - CPS app (Collision Protection System)
  - Turn-cut app
  - Tool management app
  - Status monitoring and alarm guidance app
- Max. program memory : 40GB (option)
- App-based Interface for Smartphones & Tablet PC

Customized

- Simple Customization
- Extend Functionality with Additional apps
- Register for up to 6 individual users

Flexible

- Simple Connectivity with External Software (Cloud, Office etc.)
- SSD data server app
- PC based operating system (Windows®7)

DVF 5000

CUFOS Interface

User-Friendly Interface

CUFOS, the PC-based control created by Doosan Machine Tools, is an integrated system solution using an intuitive 19 inch touch screen. The system provides a convenient operator interface, a high level of customization and many useful high technology apps.

Intuitive operation via the touch screen

Simple customization is available for customers' work environment.

Supports various Apps in three fields – Setup/Machining/Utility.
It provides easy configuration by allowing the user to add and edit functions on the Home Screen according to job requirements.

CUFOS Open CNC

CUFOS operation for enhanced productivity

The CUFOS operating system is based upon the integration of all aspects of the manufacturing process, including setting, machining and maintenance. It consolidates up-to-date software technology created by Doosan Machine Tools, to improve overall efficiency and productivity. Using the system's modular construction, each function can be easy integrated with external PC software systems and applications, such as CAM and Tool Data systems.

DOOSAN CUFOS

CUFOS Machines

Maximizing efficiency for multi-tasking machining

Applied to those multi-tasking turning center like PUMA SMX series as well as high performance, high productivity horizontal machining center NHP/NHM series, CUFOS maximizes the operational efficiency by adding up-to-date software technology of Doosan Machine Tools including new developed application such as CPS (Collision Protection System), Turn-cut, and the Tool Management function etc.

PUMA SMX series

NHP series

NHM series

TT series

DVF series

Machining

Reduce downtime and improve productivity by providing CPS(Collision Protection System), real-time status monitoring and maintenance guides during operating the machine

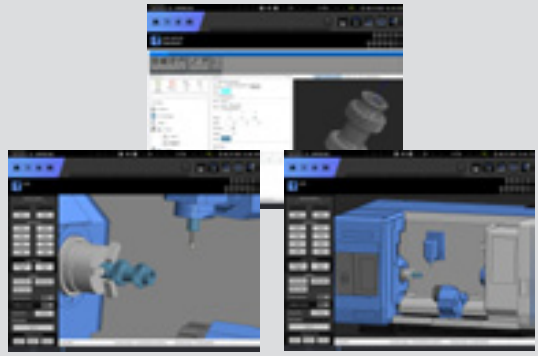
CPS (Collision Protection System)

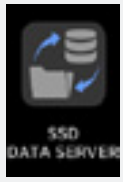
A function to prevent real-time collision in manual mode between the tool and equipment / machine elements inside the working area.

Applicable models:
NHM/NHP/PUMA SMX series

- Supports Sandvik's cloud-based tool library for creation of 3D tool model

Use the Setup Manager with the CPS app to build up the machine model, and add tool, workpiece and workholding equipment details.





SSD data server

As a PC based NC, it allows the HDD to be used as a storage space for machining program, saving time for program transfer.

Applicable models:
NHM/NHP/PUMA SMX series

Max. storage size
40GB*

Max. file size
2GB

Max. file number
Up to 1000
(including folder)

* Max. storage size is determined by the size of SSD in Panel iHPro. If customer need Max. storage size of 40GB, it is necessary to select SSD129GB(option).

NC control

Easy to convert the screen to standard FANUC format for operator convenience

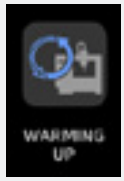
Status monitoring & Alarm guidance

Displays the cause and necessary action for NC/PMC alarms during machine running time. The system can send an email containing the alarm message if the condition persists for a specified time period.

Applicable models:
NHM/NHP/PUMA SMX series

Set up

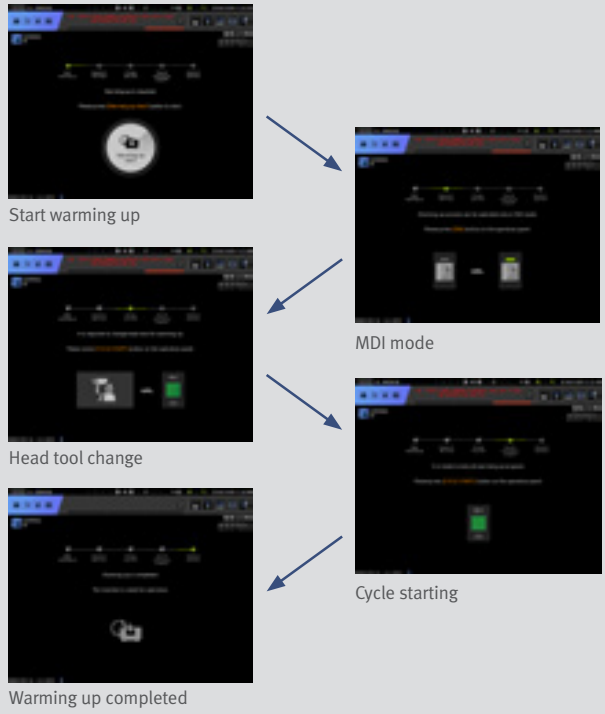
Make easy & interactive guides to facilitate machining preparations such as setting materials, tool management and warming-up



Warming up

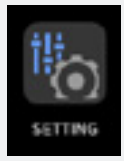
Automatically checks if a warm up process is required, and displays the required operator procedure graphically. The requirement is automatically determined by the machine status.

Applicable model:
PUMA SMX series



Utility

Support user convenience functions and additional software modules handling various peripheral devices like measurement



Setting

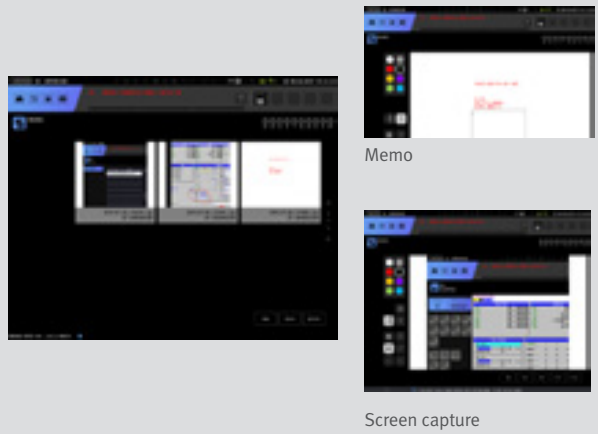
CUFOS Provides management and setting functions such as HMI parameter / User setting / Setup manager /e-mail

User setting
Allows the user to register and delete up to six persons from the user account. CUFOS apps and NC functions can be user-restricted as necessary.

Memo

Users can generate memos, either with a high level of detail via screen capture, or entered by keyboard/ touchscreen. The user can add data to existing memos if required

Maximum 120 memos can be saved



Memo through touch screen or key board or using a captured screen

Utility

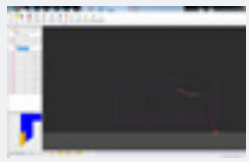
Support user convenience functions and additional software modules handling various peripheral devices like measurement

Maintenance manager

Monitors the status of machine and control elements, and confirms the alarm condition and maintenance schedule for preventative maintenance.

Manual viewer

Users can store and view manuals on the 19 inch screen.



* Video format : .wmv, .avi, .mpg, .mpeg, .mp2, mp3, .wav, .mov, .mp4 (same as Window media open files)

Video viewer

Video transfer and viewer functions make clearer communication possible between operators and helpful for training new workers, complex job arrangement

Standard / Optional Specifications (CUFOS)

A diverse range of functions and apps are available to meet specific customer requirements.

● Standard ○ Optional X Not applicable

NO.	Description	Features		DVF 5000
1	Hardware	Display Unit	19" Color display	●
2		Main RAM Memory	4GB	●
3		Program Storage Memory	2GB	●
4			20GB	○
5			40GB	○
6		2 point-touch panel port		●
7		Windows 7 operating system		●
8	Applications	Doosan Tool Management		X
9		CPS(Collision Protection System)		○
10		SSD Data server application		○
11		Set and Inspection Application(Renishaw)		X
12		Manager's Message Notification application		●
13		FTP Server service		●
14		Smart key access control application		○
15		Memo Application		●
16		Machine status Monitor application		●
17		Alarm guidance application		●
18		Sketch Cycle		X
19		Sketch Turn for CUFOS		X
20		CS Turncut		X
21		BLUM Contour Scan(BLUM)		X
22		Alarm Notification via email		●
23	iHMI Basic Application	Manual viwer application		●
24		Calendar application		●
25		Browser application		●
26		Periodic Maintenance Application		●
27		Data Logger application		●
28		Servo viewer application		●

* Please contact your Doosan machine tool representative for detailed solution information.

Convenient Operation

Convenient and intuitive User interface.

HEIDENHAIN TNC640

Superior Hardware Specifications

15 inch display and large capacity 21GB memory

15 inch display

Description	HEIDENHAIN	Remarks
Screen size	15” STD	-
Storage memory	21GB STD	-
Interference prevention system	Optional	-
Kinematic OPT.	Optional	Measuring device not included
Look-ahead block	1024 blocks	-
3D line graphics	Std.	-

FANUC 31i5

User-Friendly Operation Panel

15inch display and user-friendly operating function ensure convenient and efficient operation.

15inch display

Design optimized for customers' needs based on extensive know-how

Designed for user convenience	Convenient and intuitive UI Optimized button size High-visibility lamps Long lifecycle buttons Partitioned to prevent operator error
Convenient option buttons	Detachable buttons Spare I/O signal ports for optional devices
Customized functionality	Customer-specific function switches Available for auxiliary panel design

SIEMENS 840D

SIEMENS CNC optimized for DOOSAN machine tools maximizes users' productivity.

15.6 inch screen + New OP

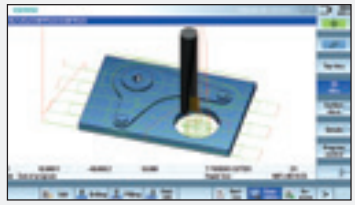
The newly-designed operation panel enhances operating convenience by incorporating common-design buttons and layout, and features the Qwerty keyboard for fast and easy operation.

15.6-inch display

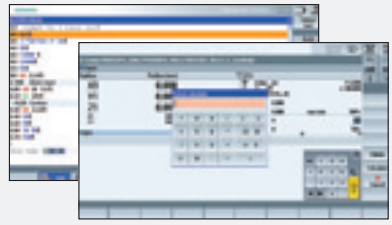
- 10MB high capacity user memory
- USB & Ethernet (standard)
- QWERTY Keyboard (standard)
- High speed calculation and simulation can be fulfilled by improved processor skill

Conversational Convenient function

The machining monitoring function developed on the basis of the Shop Mill – an interactive machining support function of SIEMENS – provides users with cutting, servicing and maintenance screens for easy and convenient machine operation.

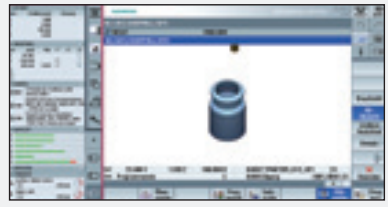


Simulation and machining contour monitoring
Simulation results with different views can be checked.



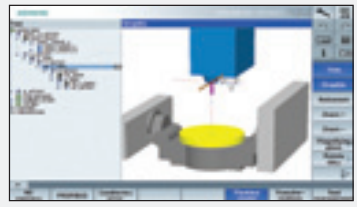
Smart function
Color highlighting is provided for each processing code function, and the calculator can be used easily by using the pocket calculator on display.

Shop Mill Part Programming
It helps to write the part program and shorten the writing time.



Side screen widget
Through the side widget, operator can easily monitor the current machining status.

5-axis kinematic measuring cycles
This function automatically measures and corrects the rotation axis center, increasing 5-axis machining accuracy.



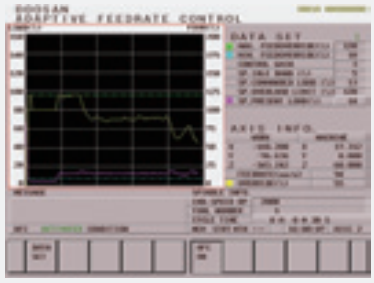
3D Collision Avoidance_Collision Avoidance ECO
Detect collisions in real time. Detection is possible in all operation modes.

Easy Operation Package

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

Easy Operation Package (EOP)

Setting up of tools, work pieces and programs, as well as troubleshooting for abnormal condition of main machine elements is designed to minimize waiting time, maximize operational efficiency, and enhance operator convenience.



Adaptive Feed Control (AFC)

Function to control feedrate so that the cutting can be carried out at a constant load
(To adapt to the spindle load set up with constant load feedrate control function)

Tool Management

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

Tool Load Monitor

Function to automatically monitor tool load
(Different loads can be set for one tool according to M700 ~ M704)

Pattern Cycle (Engraving funtion : option)

Function to create frequently-used cutting programs automatically
- Pattern Cycle: creates a program for a pre-defined shape
- Engraving: creates a program for cutting a shape described with characters (option)

Work Offset Setting

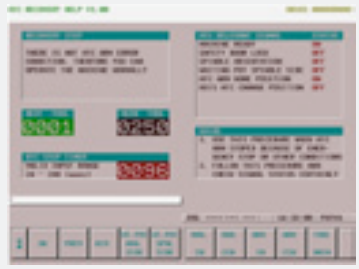
Function to configure various work offset settings

Alarm Guidance

Function to show detailed info on frequently triggered alarms and recommended actions

Sensor Status Monitor

Function to view sensor conditions of the machine



ATC Recovery

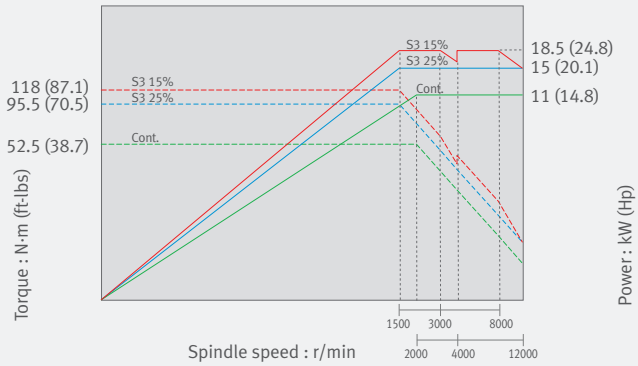
Function to view detailed info with recommended actions and to perform step-by-step operation manually (when an alarm is triggered during an ATC operation)

Power-Torque Diagram

FANUC

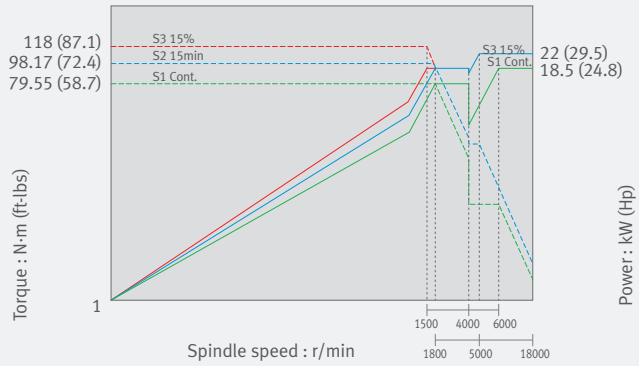
12000r/min Direct

Speed	**12000 r/min**
Power	**18.5/11 kW (24.8/14.8 Hp)**
Torque	**118 N·m (87.1 ft-lbs)**



18000r/min Built-in option

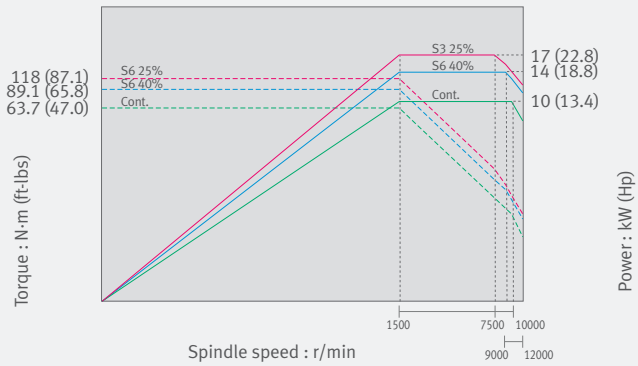
Speed	**18000 r/min**
Power	**22/18.5 kW (29.5/24.8 Hp)**
Torque	**118 N·m (87.1 ft-lbs)**



HEIDENHAIN

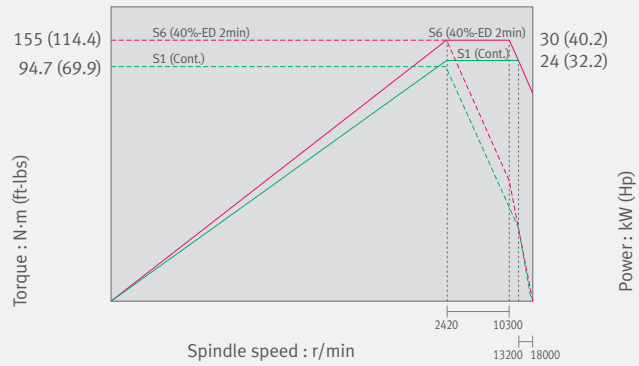
12000r/min Direct

Speed	**12000 r/min**
Power	**17/10 kW (22.8/13.4 Hp)**
Torque	**109 N·m (80.4 ft-lbs)**



18000r/min Built-in option

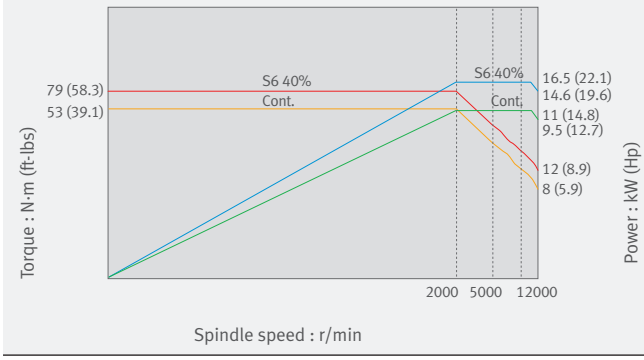
Speed	**18000 r/min**
Power	**30/24 kW (40.2/32.2 Hp)**
Torque	**155 N·m (114.4 ft-lbs)**



SIEMENS

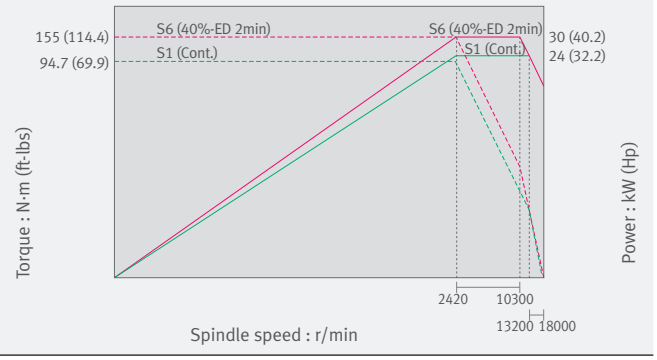
12000r/min Direct

Speed	**12000 r/min**
Power	**16.5/11 kW (22.1/14.8 Hp)**
Torque	**79 N·m (58.3 ft-lbs)**



18000r/min Built-in option

Speed	**18000 r/min**
Power	**30/24 kW (40.2/32.2 Hp)**
Torque	**155 N·m (114.4 ft-lbs)**

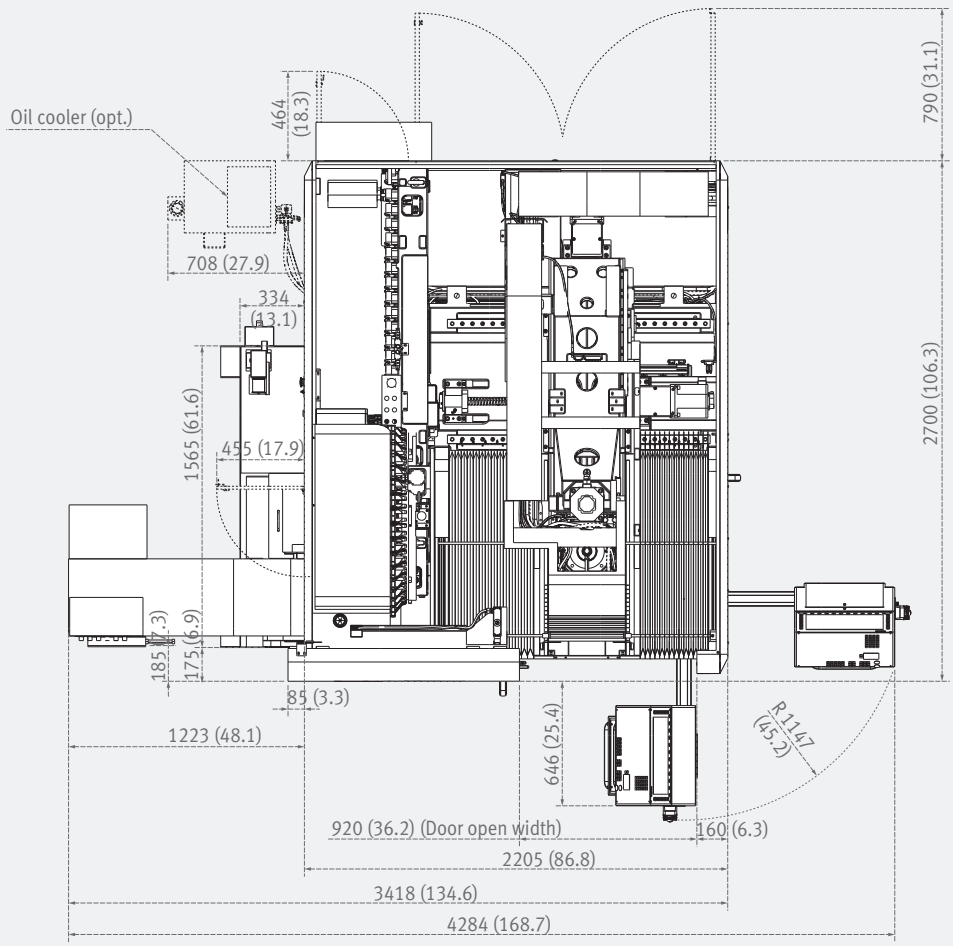


External Dimensions

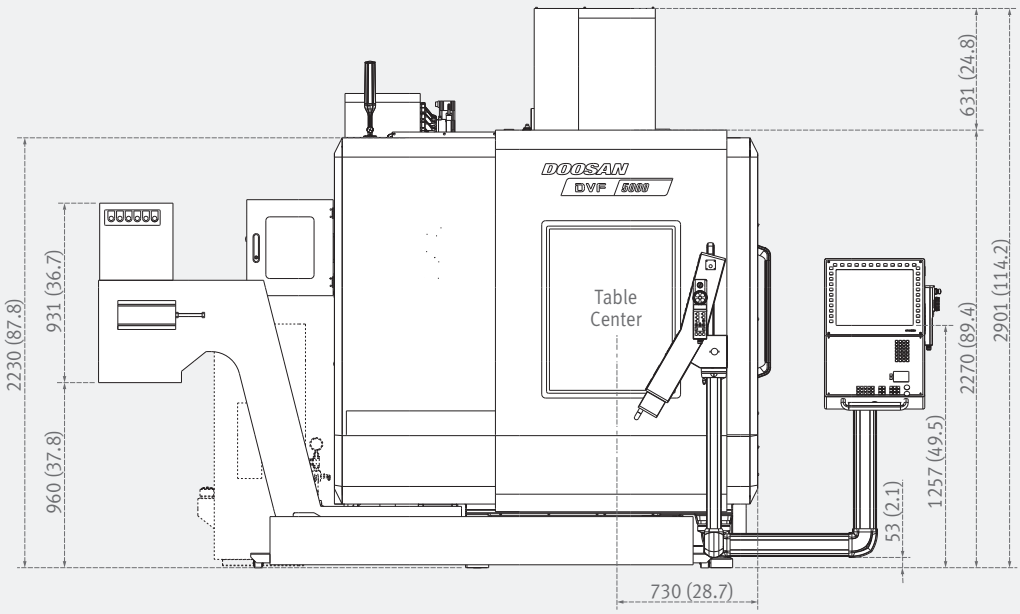
DVF 5000

Unit : mm (inch)

Top View



Front View



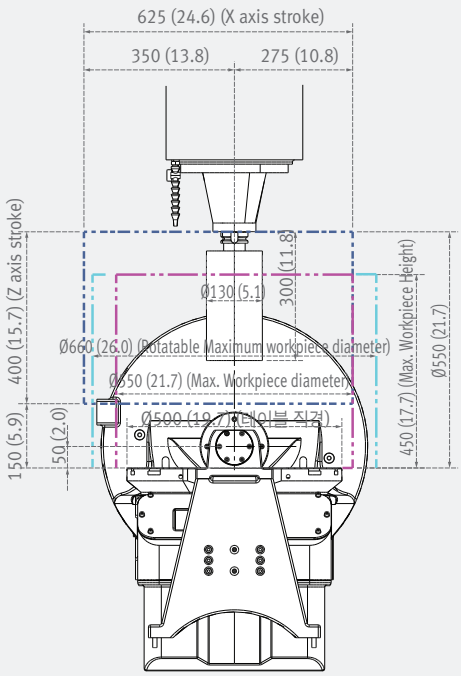
(1:20 rate)

* Some peripheral equipment can be placed in other places

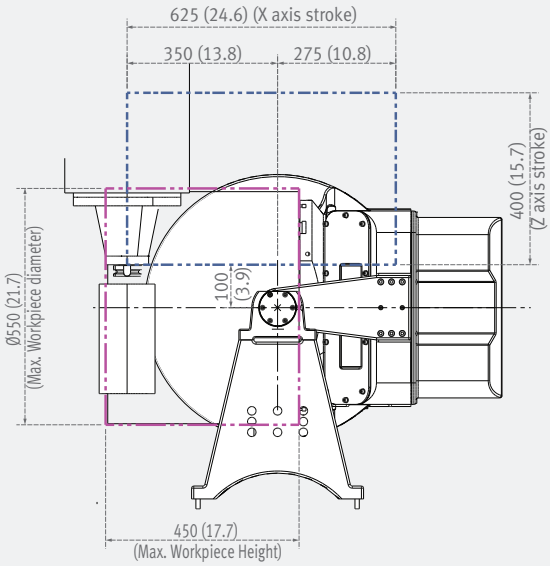
Interference diagram

DVF 5000

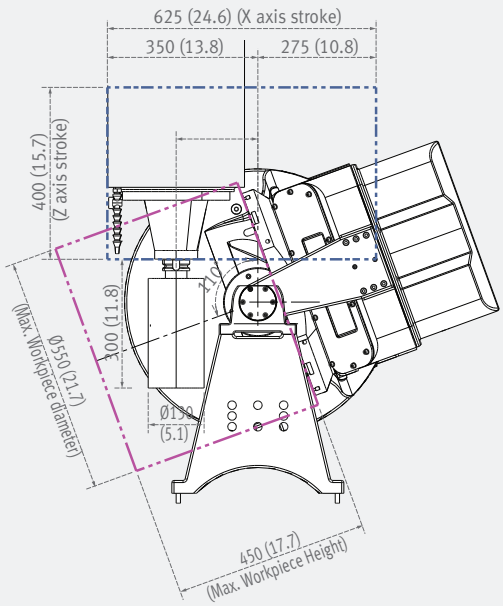
Unit : mm (inch)



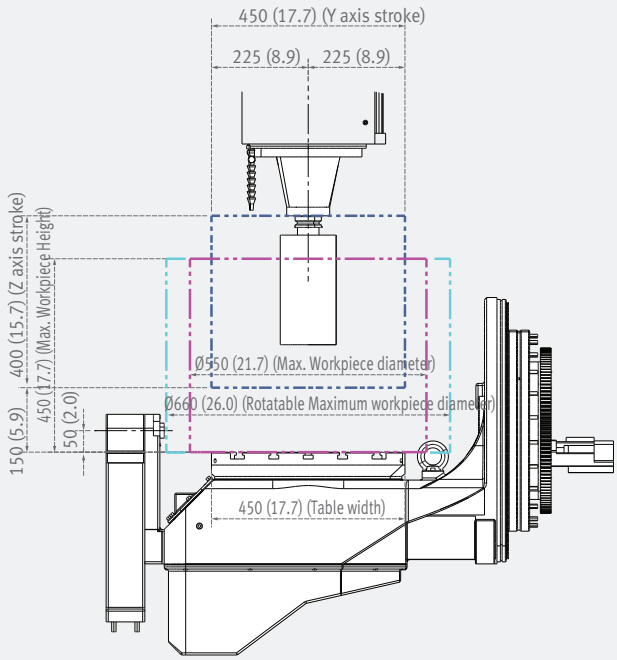
Front view (1:10)



Front view (1:10)



Front view (1:10)



Right view (1:10)

Machine Specifications

Description			Unit	DVF 5000
Travels	Travel distance	X axis	mm (inch)	625 (24.6)
		Y axis	mm (inch)	450 (17.7)
		Z axis	mm (inch)	400 (15.7)
		B axis	deg	-30 ~ +110
		C axis	deg	360
Table	Table size		mm (inch)	ø 500 x 450 {ø 630 x 450}* (ø 19.7 x 17.7 {ø 24.8 x 17.7})
	Max. workpiece size		mm (inch)	ø 550 x h 450 (ø 21.7 x h 17.7)
	Table loading capacity		kg (lb)	400 (881.8)
Spindle	Max. spindle speed		r/min	12000 {18000}*
	Max. spindle power (S3/Cont.)		kW (Hp)	Fanuc : 18.5 {22}* (24.8 {29.5}) H/H : 17 {30}* (22.8 {40.2})
	Max. spindle torque		N·m (ft-lbs)	Fanuc : 118 {118}* (87.1 {87.1}) H/H : 109 {155}* (80.4 {114.4})
Feedrate	Rapid traverse rate	X axis	m/min (ipm)	40 (1574.8)
		Y axis	m/min (ipm)	40 (1574.8)
		Z axis	m/min (ipm)	40 (1574.8)
		B axis	r/min	20
		C axis	r/min	20
Automatic Tool Changer	Type of tool shank	Tool shank	-	ISO #40
	Tool storage capa.		ea	30 {40, 60, 90, 120}*
	Max. tool diameter	Continous	mm (inch)	75 (3.0)
		Without adjacent tools	mm (inch)	125 (4.9)
	Max. tool length		mm (inch)	300 (11.8)
	Max. tool weight		kg (lb)	8 (17.6)
	Tool change (Tool-to-Tool)		sec	1.3
Tank capacity	Coolant tank capacity		L (gal)	410 (108.3)
Machine Dimensions	Height		mm (inch)	2890 (113.8)
	Length		mm (inch)	2205 (86.8)
	Width		mm (inch)	2700 (106.3)
	Weight		kg (lb)	7500 (16534.4)
Control	NC system		-	CUFOS / FANUC 31i5 / HEIDENHAIN TNC640 / SIEMENS S840D

*{ } : Option

NC Unit Specifications

FANUC

● Standard ○ Optional X N/A

No.	Item		Spec.	FANUC 31i5
1	Controlled axis	Controlled axes	5 (X, Y, Z, C,B)	X, Y, Z, C, B
2		Additional controlled axes	5 axes in total	STD.
3		Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 3 axes Circular interpolation(G02, G03) : 2 axes	X
4			Positioning(G00)/Linear interpolation(G01) : 4 axes Circular interpolation(G02, G03) : 2 axes	X
5			Positioning(G00)/Linear interpolation(G01) : 5 axes Circular interpolation(G02, G03) : 2 axes	●
6		Control axis detach		X
7		Backlash compensation		●
8		Emergency stop / overtravel		●
9		HRV control	HRV 3+	●
10		Least command increment	0.001 mm / 0.0001"	●
11		Least input increment	0.001 mm / 0.0001"	●
12		Increment system C	IS-C	○
13		Machine lock	all axes / Z axis	●
14		Mirror image	Reverse axis movement (setting screen and M - function)	●
15		Stored pitch error compensation	Pitch error offset compensation for each axis	●
16		Interpolation type pitch error compensation		○
17		Inclined Rotary Axis Control		○
18		Stored stroke check1	Overtraval controlled by software	●
19		Position switch		●
20		Incremental pulse coder		X
21		Absolute pulse coder		●
22	Interpolation & Feed function	2nd reference point return	G30	●
23		3rd / 4th reference return		●
24		Circular interpolation	G02, G03	●
25		Nano interpolation		●
26		Inverse time feed		○
27		Cylinderical interpolation	G07.1	○
28		Linear interpolation	G01	●
29		Helical interpolation		●
30	Interpolation & Feed function	Helical interpolation B	Only Fanuc 30i	○
31		Smooth interpolation		○
32		NURBS interpolation		○
33		Exponential interpolation		○
34		Involute interpolation		○
35		Helical involute interpolation		○
36		Bell-type acceleration/deceleration before look ahead interpolation		●
37		Smooth backlash compensation		●
38		Dwell	G04	●
39		Exact stop check	G09, G61 (mode)	●
40		Feed per minute	mm / min	●
41		Feedrate override	0 - 200 % (10% unit)	●
42		Jog override	0 - 200 % (10% unit)	●
43		Automatic corner override	G62	○
44		Automatic corner deceleration		●
45		Cutting feedrate clamp		●
46		Rapid traverse bell-shaped acceleration/ deceleration		●
47		Manual handle feed	Max. 3unit	1 unit
48		Manual handle feed rate	x1, x10, x100 (per pulse)	●
49		Handle interruption		○
50		Manual handle retrace		○
51		Manual handle feed 2/3 unit		○
52		Override cancel	M48 / M49	●
53		Positioning	G00	●
54		Rapid traverse override	F0 (fine feed), 25 / 50 / 100 %	●
55		Reference point return	G27, G28, G29	●
56		Skip function	G31	●
57		Nano smoothing	AI contour control II is required.	●
58		Nano smoothing 2	AI contour control II is required. Only Fanuc 31i-B5 and 30i	○
59		AI APC	20 BLOCK	X
60		AICC I	30 BLOCK	X
61		AICC I	40 BLOCK	X
62		AICC II	200 BLOCK	●
63		AICC II	400 BLOCK	○
64		High-speed processing	600 BLOCK	○
65		Look-ahead blocks expansion	1000 BLOCK	○
66		DSQ I	AICC II (200block) + Machining condition selection function	●

HEIDENHAIN

● Standard ○ Optional X N/A

No.	Item		Spec.	TNC 640
1	Controlled axis	Controlled axes	3 axes	X
2			4 axes	X
3			5 axes	X, Y, Z, C, B
4		Additional controlled axes	6 axes	X
5		Simultaneously controlled axes	Controlled axes	●
6		Controlled axes	Max. 18 axes in total	OPT(Max. 18 axes)
7		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	●
8		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	●
9		Maximum commandable value	±99999.999mm (±3937 inch)	●
10		Axis feedback control	Double-speed control loops for high-frequency spindles and torque/linear motors	○
11		MDI / DISPLAY unit	15.1 inch TFT color flat panel	●
12			19 inch TFT color flat panel	○
13		Program memory for NC programs	SSDR	21GB
14		Block processing time		0.5 ms
15		Cycle time for path interpolation	CC 61xx	3 ms
16		Encoders	Absolute encoders	EnDat 2.2
17	Interpolation	Straight line		5 AXES
18		Circle		3 axes
19		Helix, Combination of circular and linear motion		●
20		Spline interpolation		●
21	Configuration	Machine parameters	Numerical structure	X
22			Tree structure with symbolic names of the parameters	●
23			Tabular representation	X
24	Commissioning and diagnostics	Integrated oscilloscope		●
25		OnLine monitor (OLM)		●
26		BUS diagnostics		●
27		DriveDiag		●
28		ApiData function		●
29		Trace function		●
30		Table function		●
31		Logic diagram		●
32		I/O-Force List		●
33		Log		●
34		Machine operating panel	TE 735	●
35			TE 745	○
36		Electronic handwheels	HR 410	●
37		Data interfaces	Ethernet interface	●
38			USB interface (USB 2.0)	●
39	Machine functions	Feedrate override	0 - 150 % (10% unit)	●
40		Spindle orientation		●
41		Spindle speed command	S5 digits	●
42		Spindle speed override	0 - 150 %	●
43		Monitoring functions	Position monitoring	●
44			Movement monitoring	●
45			Standstill monitoring	●
46			Positioning window	●
47			Temperature monitoring	●
48			Amplitude of encoder signals	●
49			Edge separation of encoder signals	●
50			Nominal speed value	●
51			Buffer battery	●
52			Run-time of PLC program	●
53			Emergency-stop monitoring	●
54			Internal power supply and housing fan	●
55		Gantry axes and master-slave torque control		●
56		Look-ahead (Intelligent path control by calculating the path speed ahead of time)	Max. 1024 blocks.	X
57			Max. 5000 blocks.	●
58		ADP (Advanced Dynamic Prediction)		●
59		HSC filters		●
60		Switching the traverse ranges		●
61		C-axis operation	Spindle motor drives the rotary axis	●
62	User functions	Program input	According to ISO	●
63			With smarT.NC	X
64			With smartSelect	●
65		Position entry	Nominal positions for lines and arcs in Cartesian coordinates	●
66			Incremental or absolute dimensions	●
67			Display and entry in mm or inches	●

NC Unit Specifications

SIEMENS

● Standard ○ Optional X N/A

No.	Item		Spec.	S840D
1	Controlled axis	Controlled axes	4 axes	X
2			5 axes	X, Y, Z, C, B
3		Additional controlled axes	Max. 31 axes in total(S840Dsl) /Max. 5 axes in total(S828D)	○
4		Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 5 axes Circular interpolation(G02, G03) : 2 axes	●
5		Backlash compensation		●
6		Emergency stop / overtravel		●
7		Least command increment	0.001mm (0.0001 inch)	●
8		Least input increment	0.001mm (0.0001 inch)	X
9			0.0001mm (0.0001 inch)	●
10		Maximum commandable value	±99999.999mm (±3937 inch)	●
11		Machine lock (PRT)	All axes	●
12		Position switching signals/cam controller		●
13		Absolute encoder		●
14		Travel to fixed stop with Force Control		○
15	Interpolation & Feed Function	Dry run		●
16		Feedrate/Rapid override	0 - 120 %	●
17		Reference point return	G75 FP=1	●
18		2nd reference point return	G75 FP=2	●
19		3rd / 4th reference return	G75 FP=3, 4	●
20		Advanced surface		●
21		Top surface		○
22		Linear interpolation	Max. 4	●
23		Circular interpolation	G02, G03	●
24		Inverse time feedrate	G93	●
25		Helical interpolation		●
26		Universal interpolator NURBS		●
27		Polynomial interpolation		○
28		Spline interpolation (A, B and C splines)		●
29		Involute interpolation		○
30		Dwell	G04	●
31		Separate path feed for corners and chamfers		●
32		Reposition		●
33		Acceleration with Jerk limitation		●
34		Compressor for 3-axis machining		●
35		Compressor for 5-axis machining		●
36		Temperature compensation		●
37		Positioning	G00	●
38		Look ahead number of block	S/W version 4.5	150
39			S/W version 4.7	1000
40			S/W version 4.8	1000
41		Cartesian point-to-point (PTP) travel		●
42		TRANSMIT/cylinder surface transformation		●
43		Inclined axis		X
44		Inclined axis TRAANG after TRANSMIT/TRACYL		●
45	Spindle & M code Function	Spindle speed, digital setpoint		●
46		Spindle speed, max. programmable value range	106 ... 0.0001 (display: ± 999999999.9999)	●
47		Spindle override	50 - 120 %	●
48		Automatic gear state selection		●
49		Oriented spindle stop		●
50		Spindle speed limitation min./max.		●
51		Constant cutting rate		●
52		Spindle control via PLC (Positioning, oscillation)		●
53		Changeover to axis mode		●
54		Tapping with compensating chuck/rigid tapping		●
55	Tool Function	Tool radius compensations in plane	With approach and retract strategies	●
56			With transition circle/ellipse on outer edges	●
57		3D Tool radius compensation		●
58		Number of tools/cutting edges in tool list	256/512	X
59			600/1500	●
60		Tool length compensation		●
61		Operation with tool management		●
62		Tool list		●
63		Tool offset selection via T and D numbers		●
64		Replacement tools for tool management		●
65		Monitoring of tool life and workpiece count		●
66		Manual measurement of tool offset		●
67	Programming & Editing Function	Programming language (DIN 66025 and high-level language expansion)		●
68		Main program call from main program and subprogram		●
69		Subprogram levels and interrupt routines, max.		16/2
70		Number of subprogram passes <= 9999		●
71		Number of levels for skip blocks		8
72		Number of levels for skip blocks, maximum 10		X
73		Polar coordinates		●
74		1/2/3-point contours		●
75		Dimensions metric/inch, changeover manually or via program		●
76		Auxiliary function output	Dynamic preprocessing memory FIFO	●
77			Via H word, max. range: REAL ± 3.4028 ex 38, INT -231 ... 231-1	●
78		CNC High-level language with	User variables, configurable	●
79			Read/write system variables	●
80			Indirect programming	●
81			Program jumps and branches	●
82			Program coordination with WAIT, START, INIT	●
83			Arithmetic and trigonometric functions	●
84			Compare operations and logic combinations	●
85			Macro techniques	●
86			Control structures IF-ELSE-ENDIF	●
87			Control structures WHILE, FOR, REPEAT, LOOP	●
88			STRING functions	●

● Standard ○ Optional X N/A

No.	Item		Spec.	S840D
89	Programming & Editing function	Program functions	Dynamic preprocessing memory FIFO	●
90			Frame concept	●
91			Inclined-surface machining with swivel cycle	●
92			Axis/spindle replacement	●
93			Geometry axes, switchable online in the CNC program	●
94			Program preprocessing	●
95		Online ISO dialect interpreter		●
96		Program/workpiece management	Parts programs on (PPU or NCU), max. number	1000
97			Workpieces on (PPU or NCU), max. number	250
98			Workpieces on Hard disk, max. number	○
99			In additional HMI user memory on CF card	●
100			On additional plug-in CF card	X
101			On integral Hard disk PCU50.5	○
102			On USB storage medium (e.g. disk drive, USB stick)	●
103			On network drive	●
104			Templates for workpieces, programs and INI files	●
105			Job lists	●
106		Basic frames, max. number		16
107		Settable offsets, max. number	G54, G55, G56 ...	100
108		Zero/work offsets, programmable (frames)		●
109		Scratching, determining zero/work offset		●
110		Work offsets, external via PLC		●
111		Global and local user data		●
112		Global program user data		●
113		Display system variables		○
114		Program editor	Programming support for cycles program (Program Guide)	●
115			Dual editor	●
116			CNC editor with editing functions: Marking, copying, deleting	●
117			Programming graphics/free contour input (contour calculator)	●
118			Screens for 1/2/3-point contours (contour definition programming)	●
119			Support for parameter input Animated Elements	●
120			Shopturn/ShopMill Machining step programming	●
121		Technology cycles for drilling/milling		●
122		Pocket milling free contour and islands stock removal cycle		●
123		Residual material detection		●
124		Access protection for cycles		○
125		Programming support can be extended, e.g. customer cycles		●
126		Quck view for mold making program		●
127		2D simulation		●
128		3D simulation, finished part		●
129		Simultaneous recording		●
130		Measure kinematics		●
131		DXF Reader for PC integrated in SINUMERIK Operate		○
132	Others functions (Operation, setting & Display, etc)	JOG	Handwheel selection	●
133			Switchover: inch/metric	●
134			Manual measurement of zero/work offset	●
135			Manual measurement of tool offset	●
136			Automatic tool/workpiece measurement	●
137			Reference point approach, automatic/via CNC program	●

No.	Item		Spec.	S840D
138	Others functions (Operation, setting & Display, etc)	MDA	Input in text editor	●
139			Save MDA program	●
140			Input screen forms for technology and positioning, cycle support	●
141		Teach-in		●
142		Automatic	Execution from USB interface on operator panel front	●
143			Execution from HMI memory on NCU CF card	●
144			Execution from network drive	●
145			Execution from Hard disk (PCU50.5)	○
146			Program control	●
147			Program editing	●
148			Overstoring	X
149			DRF offset	●
150			Block search with/without calculation	●
151		CNC user memory expanded for programs	‹ 100MB	○
152		Execution from external storage EES		○
153		Repos (repositioning on the contour)	With operator command/semi-automatically	●
154			Program-controlled	●
155		Preset	Set actual value	●
156		15.6" color display with touch screen		●
157		18.5" color display with touch screen		○
158		Plain text display of user variables		●
159		Multi-channel display		○
160		2D representation of 3D protection areas/work areas		●
162		Access protection, 7 levels		●
163		Operating software languages	Ch_S, En, Fr, Gr, It, Sp	●
164			Ch_T, Kr, Pt	○
165			Additional languages, use of language extensions	○
166		Working area limitation		●
167		"Limit switch monitoring		●
168		(Software and hardware limit switches)"		●
169		Axis limitation from the PLC		●
170		Alarms and messages		●
171		Action log can be activated for diagnostic purposes		●
172		PLC status		○
173		Remote Control System (RCS) remote diagnostics	RCS Host remote diagnostics function	●
174			RCS Commander (viewer function)	●
175		Integrated service planner for the monitoring of service intervals		●
176		Automatic measuring cycles		X
177		Easy Extend		○
178		Contour handwheel		●
179		Integrate screens in SINUMERIK Operate with SINUMERIK Integrate Run MyScreens		●
180		Cross-mode actions (ASUPs and synchronized actions in all operating modes)		●
181		Axis collision protection PROT		●
182		Collision avoidance ECO (machine, working area)		○
183		MDynamics 3-axis		X
184		MDynamics 5-axis		●

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.

Global Sales and Service Support Network

Corporations	Dealer Networks	Technical Centers Technical Center: Sales Support, Service Support, Parts Support	Service Post	Factories
4	167	51	200	3

Doosan Machine Tools 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

Major Specifications

DVF 5000

Description			Unit	DVF 5000
Travel	Travel distance	X-axis	mm (inch)	625 (24.6)
		Y-axis	mm (inch)	450 (17.7)
		Z-axis	mm (inch)	400 (15.7)
		B-axis	deg	-30 ~ +110
		C-axis	deg	360
Feedrate	Rapid traverse	X-axis	m/min (ipm)	40 (1574.8)
		Y-axis	m/min (ipm)	40 (1574.8)
		Z-axis	m/min (ipm)	40 (1574.8)
		B-axis	r/min	20
		C-axis	r/min	20
Spindle	Max. Spindle Speed		r/min	12000 {18000}*
	Max. Spindle Power		kW (Hp)	Fanuc : 18.5 {22}* (24.8 {29.5}) H/H : 17 {30}* (22.8 {40.2})
	Max. Spindle Torque		N·m (lbf-ft)	Fanuc : 118 {118}* (87.1 {87.1}) H/H : 109 {155}* (80.4 {114.4})
	Tool shank		-	ISO #40
Table	Table size		mm (inch)	ø 500 x 450 {ø 630 x 450}* (ø 19.7 x 17.7 {ø 24.8 x 17.7})
	Max. Work size		mm (inch)	ø 550 x h 450 (ø21.7 x h 17.7)
	Max. Work load		kg (lb)	400 (881.8)
ATC	Tool capacity		ea	30 {40, 60, 90, 120}*
Machine Dimensions	Length x Width		mm (inch)	2205 x 2700 (86.8 x 106.3)

*{ } Option

Doosan Machine Tools

www.doosanmachinetools.com

Head Office
22F T Tower, 30, Sowol-ro 2-gil, Jung-gu, Seoul, Korea, 04637
Tel +82-2-6972-0370 / 0350
Fax +82-2-6972-0400

Doosan Machine Tools America
19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.
Tel +1-973-618-2500
Fax +1-973-618-2501

Doosan Machine Tools Europe
Emdener Strasse 24, D-41540 Dormagen, Germany
Tel +49-2133-5067-100
Fax +49-2133-5067-111

Doosan Machine Tools India
No.82, Jakkuar Village, Yelahanka Hobil, Bangalore-560064
Tel + 91-80-2205-6900
E-mail india@doosanmt.com

Doosan Machine Tools China
Room 101,201,301, Building 39 Xinzhuan Highway No.258 Songjiang District,China Shanghai(201612)
Tel +86 21-5445-1155
Fax +86 21-6405-1472

* For more details, please contact Doosan Machine Tools.
* The specifications and information above-mentioned may be changed without prior notice.
* Doosan Machine Tools Co., Ltd. is a subsidiary of MBK Partners. The trademark DOOSAN is used under a licensing agreement with Doosan Corporation, the registered trademark holder.

Fire Safety Precautions | There is a high risk or 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.

ver. EN 200825 SU