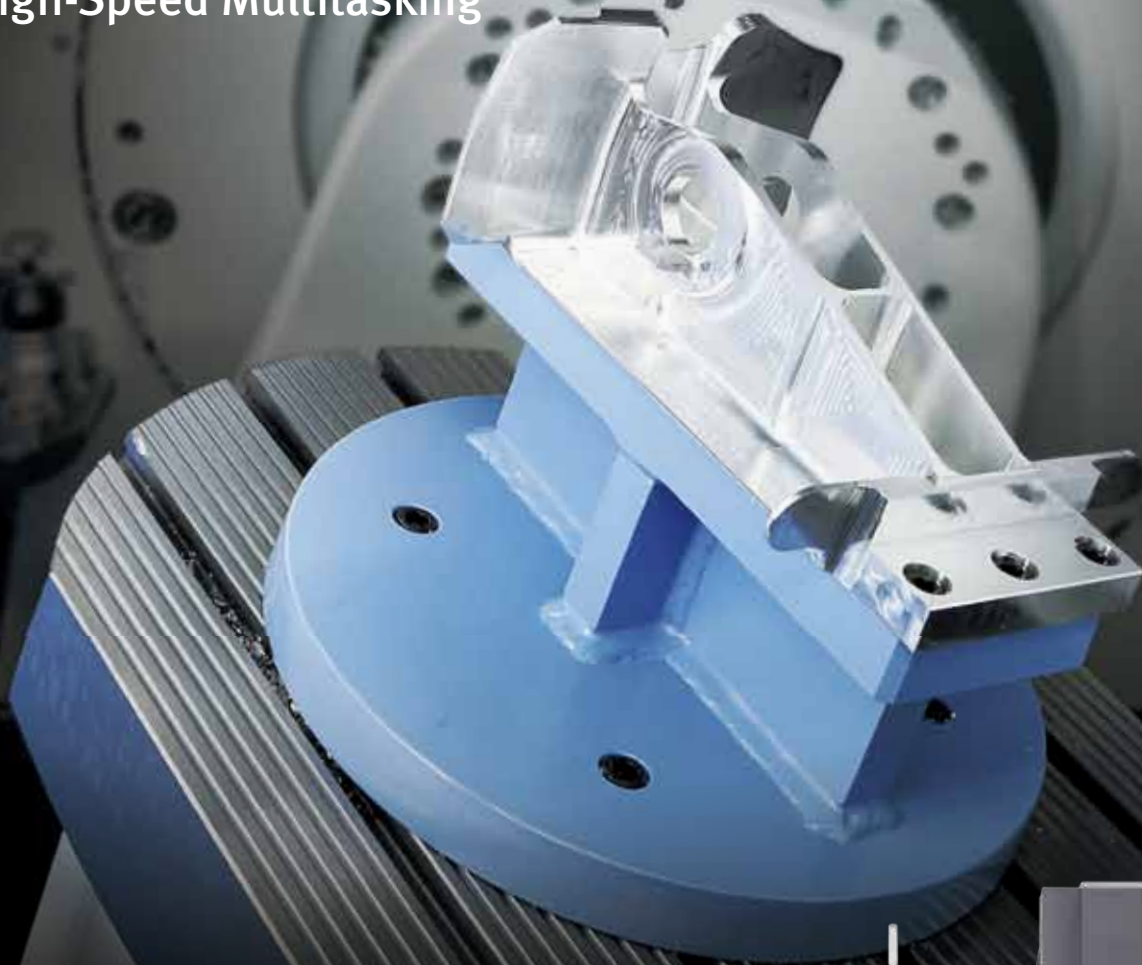


DOOSAN



DVF 5000

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



**MACHINE
GREATNESS™**

Basic information

Basic Structure
Cutting
Performance

Detailed Information

Options
Applications
Diagrams
Specifications

Customer Support Service



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.



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08 Standard / Optional Specifications

10 Applications

12 Diagrams

15 Machine / CNC Specifications

18 Customer Support Service

High productivity & speed Simultaneous 5-Axis Machine

- 12000 / 18000 r/min high speed spindle
- $\varnothing 500$ mm (19.7 inch) 2-axis tilting table
(option : $\varnothing 630$ mm ($\varnothing 24.8$ 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

Basic information

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Provides high rigidity and easy operator access.

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Travel distance

X axis 625 mm
(24.6 inch)

Y axis 450 mm
(17.7 inch)

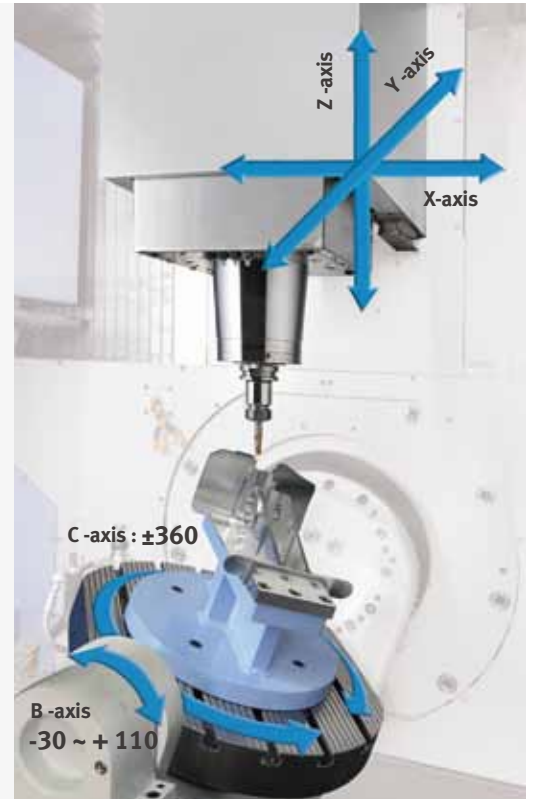
Z axis 400 mm
(15.7 inch)

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.

Fanuc

12000 r/min

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

18000 r/min option

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

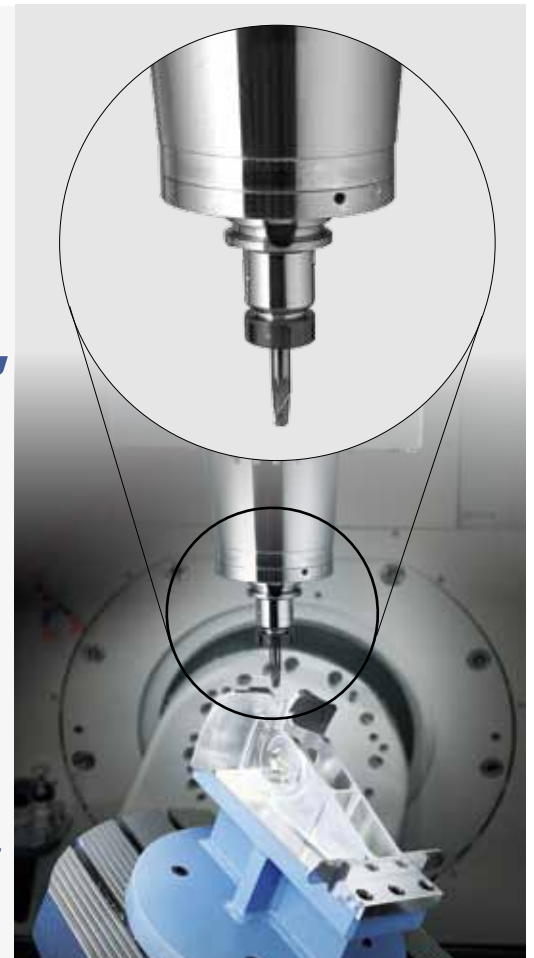
HEIDENHAIN

12000 r/min

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

18000 r/min option

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



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)

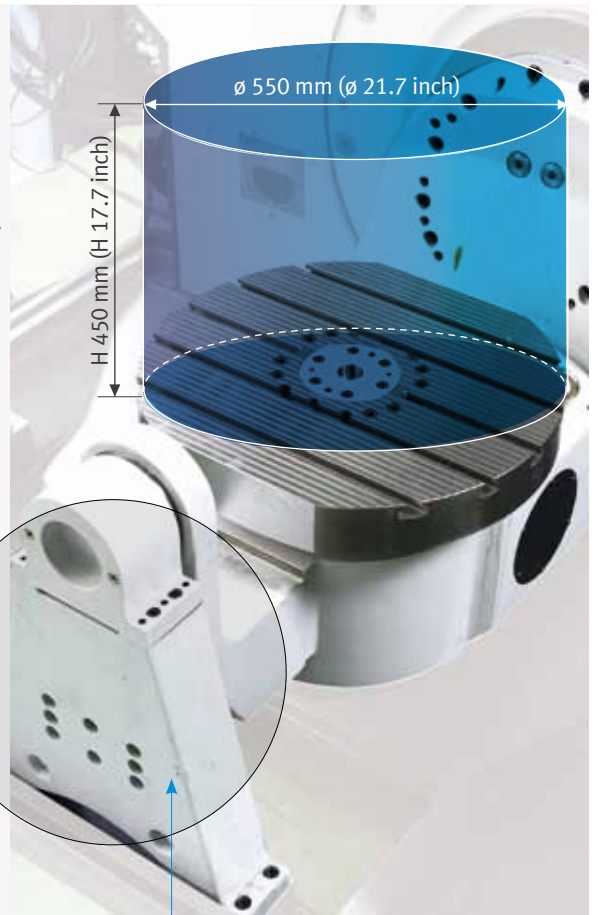
Max. workpiece size

Ø 550 x h 450 mm
(Ø 21.7 x 17.7 inch)

Max. Work load

400 kg
(881.8 lb)

(with trunnion support)



Trunnion support



Basic information

Basic Structure
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Optimized solution with compact automation.

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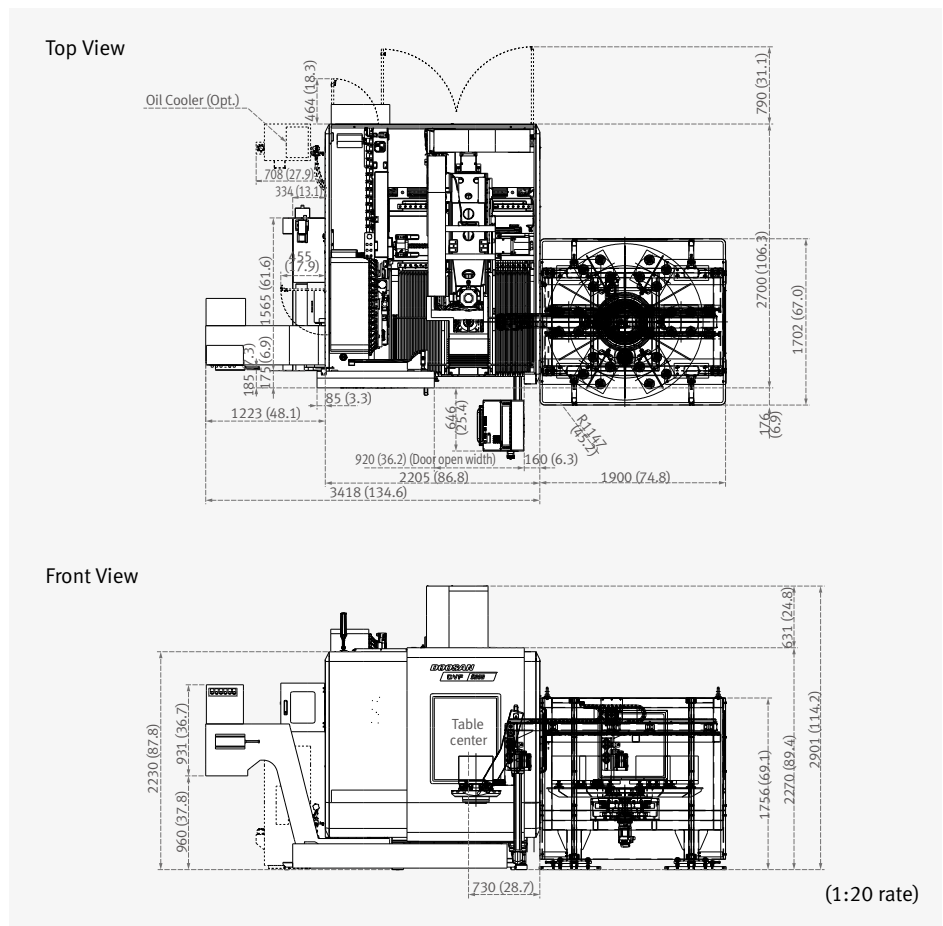
NO.	Description	Unit	DVF 5000
1	Pallet Dimension	mm (inch)	350 x 350 (13.8 x 13.8)
2	Workpiece Diameter	mm (inch)	350 x 350 (13.8 x 13.8)
3	Workpiece Height	mm (inch)	330 (13.0)
4	Workpiece Weight (w/ Pallet)	kg (lb)	250 (551.1)
5	Pallet change time	sec	40
6	Number of Setup Stations	ea	1
7	Number of pallets	ea	8*
8	Dimension(L x W)	mm (inch)	1700 x 1900 (66.9 x 74.8)

* 6 to 12 pallet options available

* Please contact DOOSAN to select detail specifications.

External Dimensions

Unit: mm (inch)





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)	

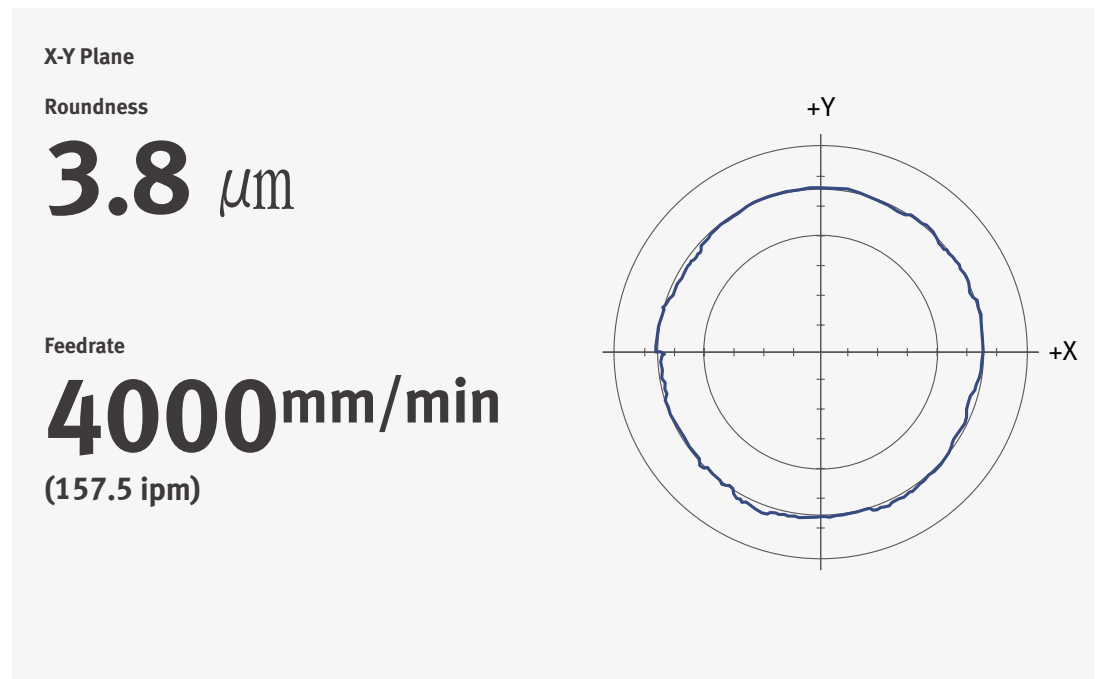
* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

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.





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

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	Chip disposal	Chip conveyor	CHIP PAN	●	
15			HINGED BELT_LEFT SIDE		○
16		Chip bucket	Forklift type		○
17			Rotation type		○
18		Air gun		○	
19	Coolant gun		○		
20	Precision machining options	Linear scale	X / Y / Z axis	○	
21	Measurement & Automation	IKC Receiver	NONE	●	
22			RENISHAW (RMI-Q)		○
23			HEIDENHAIN (SE660)		○
24			BLUM (RC66)		○
25		DATUM BALL FOR IKC	NONE		●
26			DATUM BALL_D25		○
27		TOUCH PROBE FOR IKC	NONE		●
28			RMP60_RENISHAW		○
29			TS460_HEIDENHAIN		○
30			TC60_BLUM		○
31		Automatic tool measurement	NONE		●
32			TS27R_RENISHAW		○
33			RTS_RENISHAW		○
34			NC4_RENISHAW		○
35			TT160_HEIDENHAIN		○
36			ZX SPEED_BLUM		○
37	Others	LED Work light		●	
38		3 Color signal tower		●	
39		Tool load monitoring		●	
40		EZ Guide i		○	
41		Automatic power off		●	

* Please contact DOOSAN to select detail specifications.

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 17.7inch)

Limited use of Max workpiece



Renishaw(TS27R)



Heidenhain (TT160)



Blum (ZXSpeed)

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 Recommended Option

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



3. Touch Probe



4. Datum ball





Basic information

- Basic Structure
- Cutting
- Performance

Convenient and intuitive User interface.

Detailed Information

- Options
- Applications
- Diagrams
- Specifications

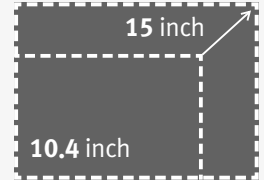
Customer Support Service

User-Friendly Operation Panel

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



Large 15inch screen 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

HEIDENHAIN

Superior Hardware Specifications

15" LCD and large capacity 21GB memory



15" LCD



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.	-

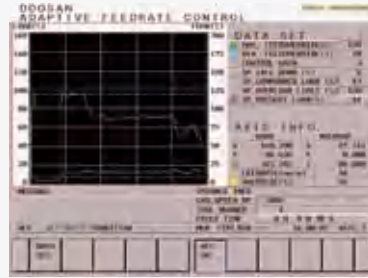


Easy Operation Package

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 function : **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



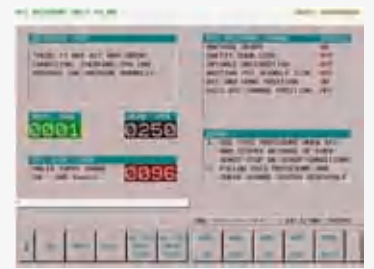
Alarm Guidance

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

Basic information

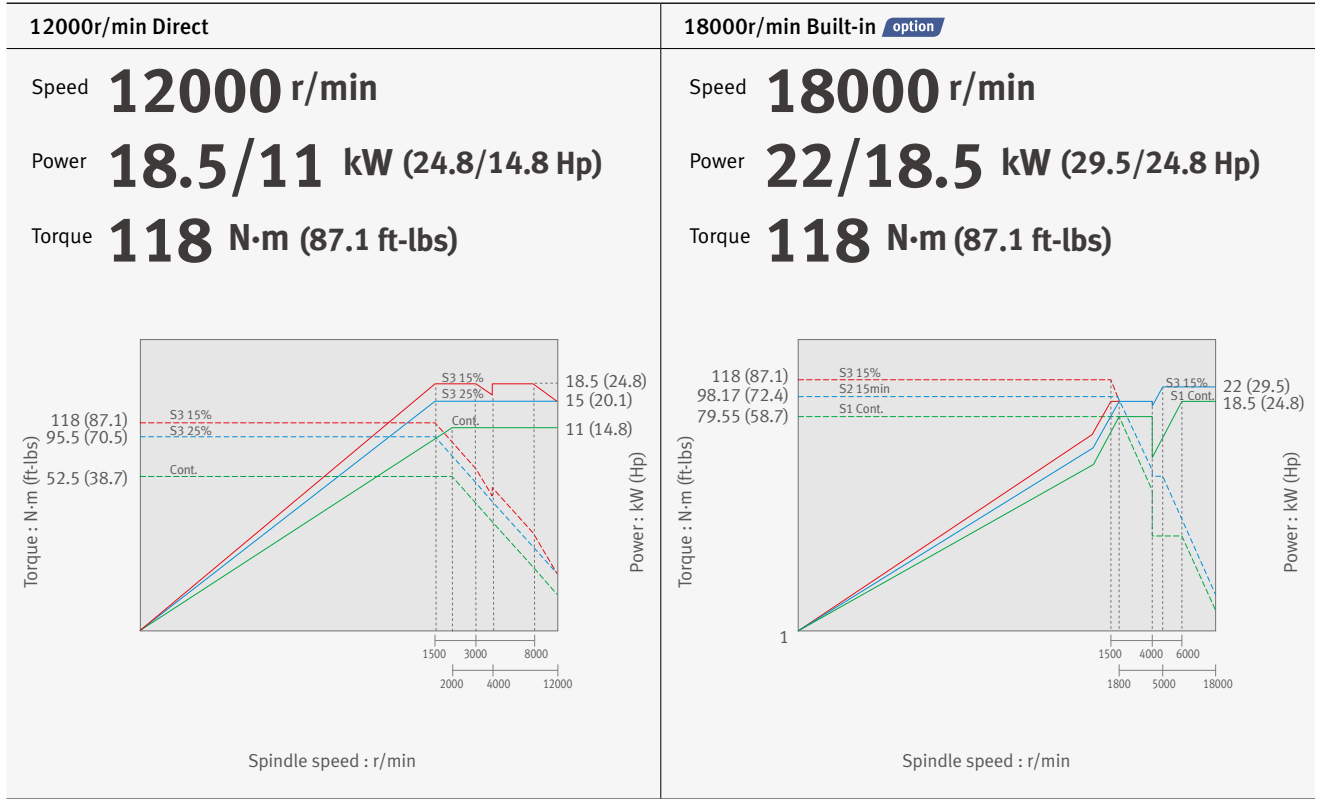
- Basic Structure
- Cutting
- Performance

Detailed Information

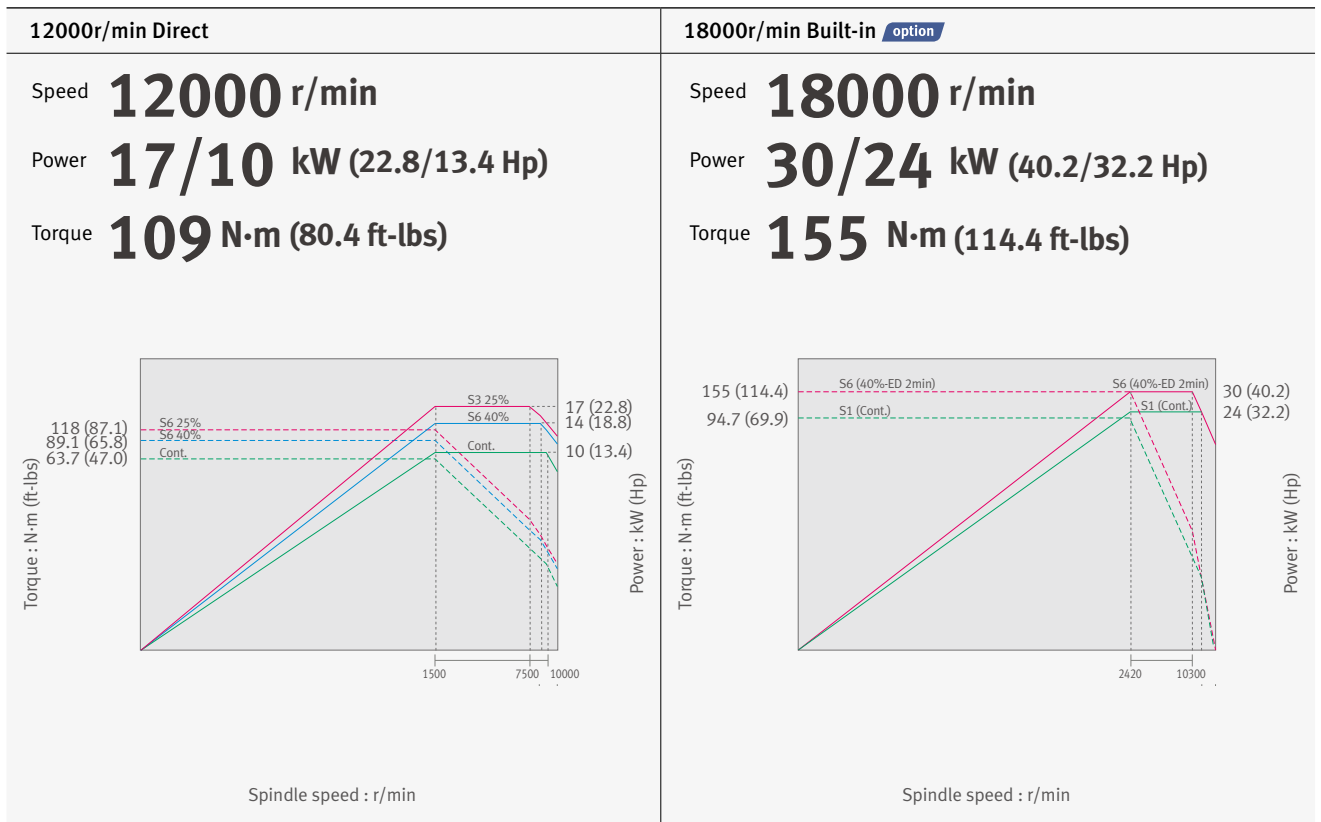
- Options
- Applications
- Diagrams
- Specifications

Customer Support Service

FANUC



HEIDENHAIN

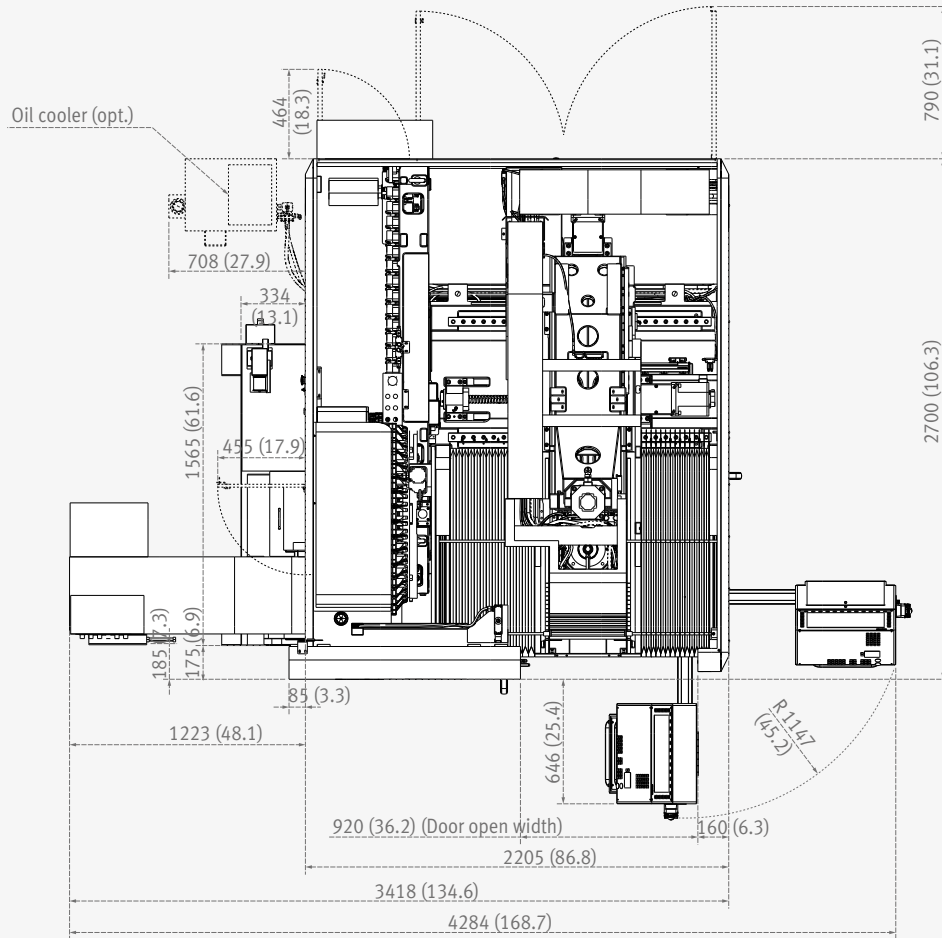


External Dimensions

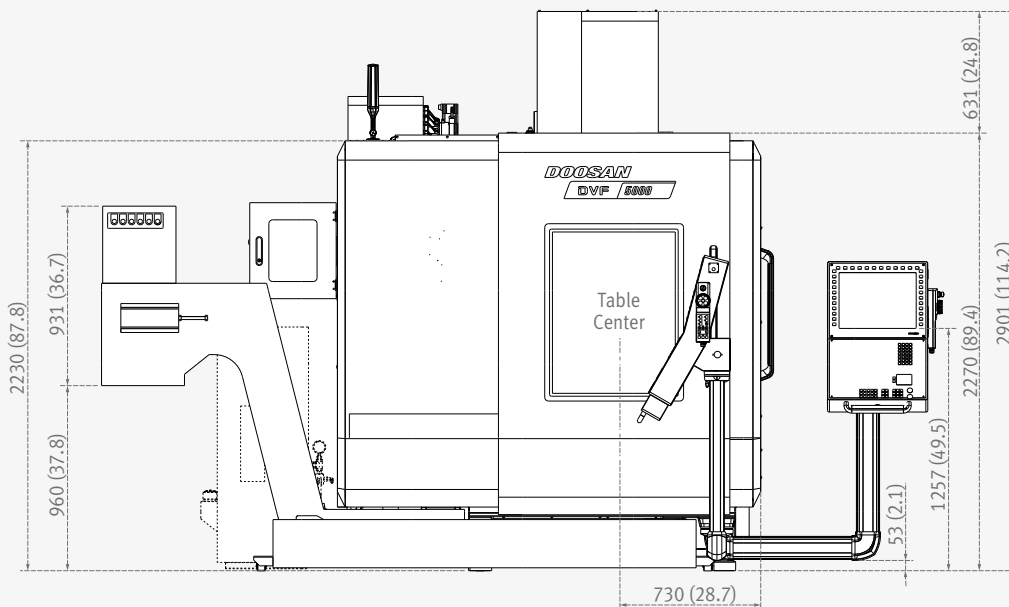
DVF 5000

Unit : mm (inch)

Top View



Front View



(1:20 rate)

* Some peripheral equipment can be placed in other places

Interference diagram

Basic information

- Basic Structure
- Cutting
- Performance

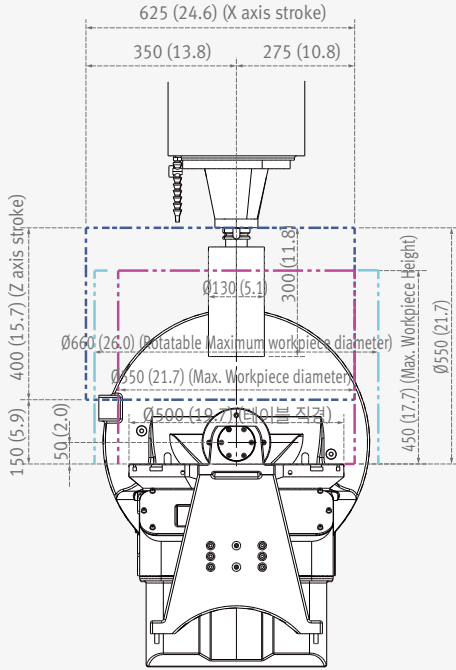
Detailed Information

- Options
- Applications
- Diagrams
- Specifications

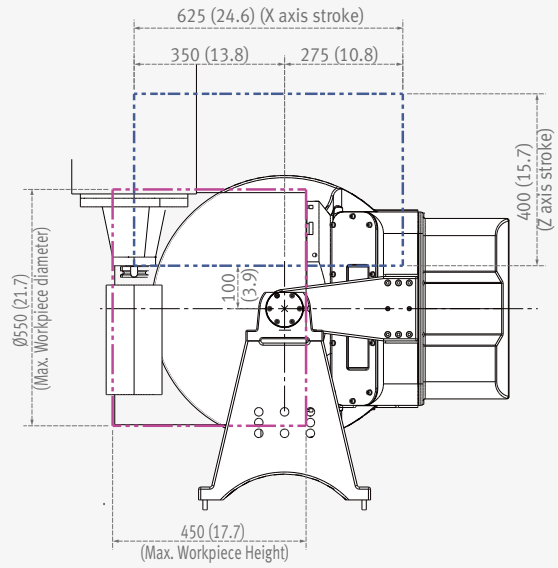
Customer Support Service

DVF 5000

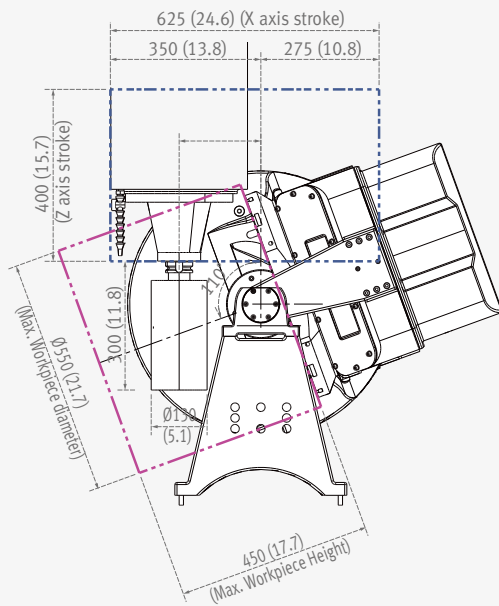
Unit : mm (inch)



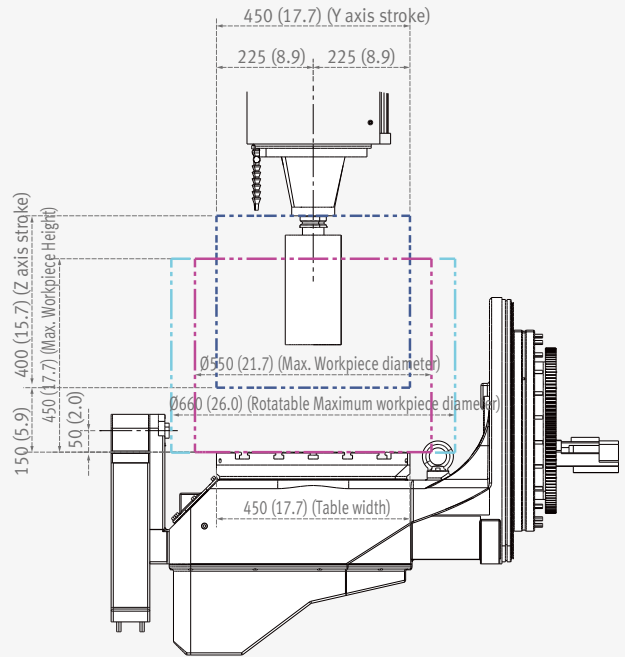
Front view (1:10)



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)	∅ 500 x 450 {∅ 630 x 450}* (∅ 19.7 x 17.7 {∅ 24.8 x 17.7})
	Max. workpiece size		mm (inch)	∅ 550 x h 450 (∅ 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	Continuous	mm (inch)	80 (40T : 76) (3.1 (40T : 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)	350 (92.5)
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		-	DOOSAN FANUC 31i HEIDENHAIN TNC640

*{ } : Option

NC Unit Specifications

● Standard ○ Optional X N/A

Basic information

- Basic Structure
- Cutting
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Detailed Information

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Customer Support Service

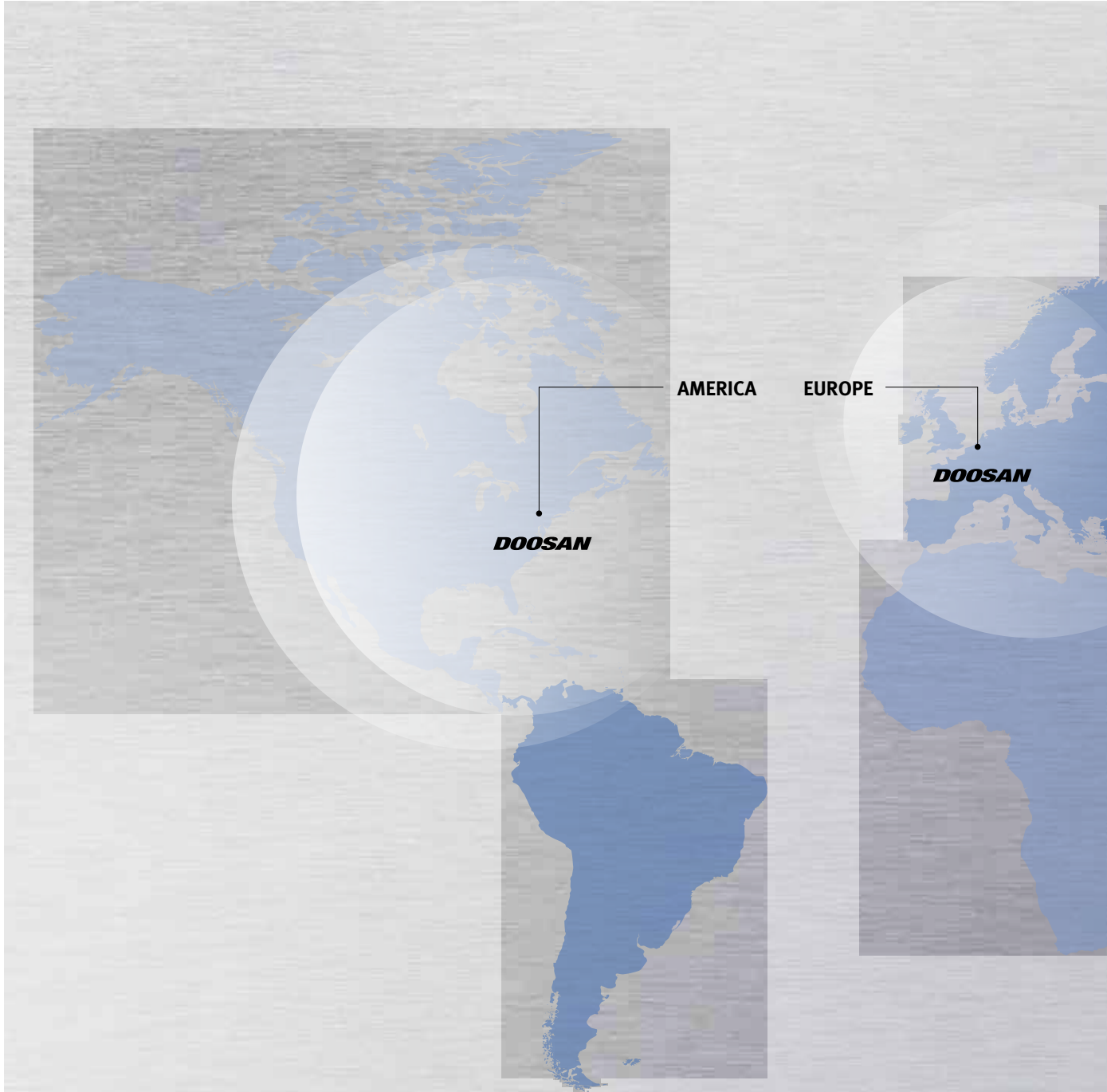


No.	Item	Spec.	Doosan Fanuc i (F0i-F)	FANUC 31iB5
1	Controlled axes	3 (X,Y,Z)	X, Y, Z, C,B	X, Y, Z, C, B
2	Additional controlled axes	5 axes in total	STD.	STD.
3	Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 3 axes	X	X
4		Circular interpolation(G02, G03) : 2 axes		
5		Positioning(G00)/Linear interpolation(G01) : 4 axes	●	X
6		Circular interpolation(G02, G03) : 2 axes		
7		Positioning(G00)/Linear interpolation(G01) : 5 axes	X	●
8	Circular interpolation(G02, G03) : 2 axes			
6	Control axis detach		●	●
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		X	○
18	Stored stroke check1	Overtravel controlled by software	●	●
19	Position switch		●	●
20	Incremental pulse coder		X	X
21	Absolute pulse coder		●	●
22	2nd reference point return	G30	●	●
23	3rd / 4th reference return		●	●
24	Circular interpolation	G02, G03	●	●
25	Nano interpolation		●	●
26	Inverse time feed		●	○
27	Cylindrical interpolation	G07.1	●	○
28	Linear interpolation	G01	●	●
29	Helical interpolation		●	●
30	Helical interpolation B	Only Fanuc 30i	X	○
31	Smooth interpolation		X	○
32	NURBS interpolation		X	○
33	Exponential interpolation		X	○
34	Involute interpolation		X	○
35	Helical involute interpolation		X	○
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	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		X	○
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	X	○
59	AI APC	20 BLOCK	X	X
60	AICC I	30 BLOCK	X	X
61	AICC I	40 BLOCK	X	X
62	AICC II	200 BLOCK	●	●
63	AICC II	400 BLOCK	X	○
64	High-speed processing	600 BLOCK	X	○
65	Look-ahead blocks expansion	1000 BLOCK	X	○
66	DSQ I	AICC II (200block) + Machining condition selection function	X	●

HEIDENHAIN TNC 640

No.	Item	Spec.	TNC 640	
1	Controlled axis	3 axes	X	
2		Controlled axes	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	Numerical structure	X	
22		Machine parameters	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	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	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	●	

Responding to Customers Anytime, Anywhere



Global Sales and Service Support Network

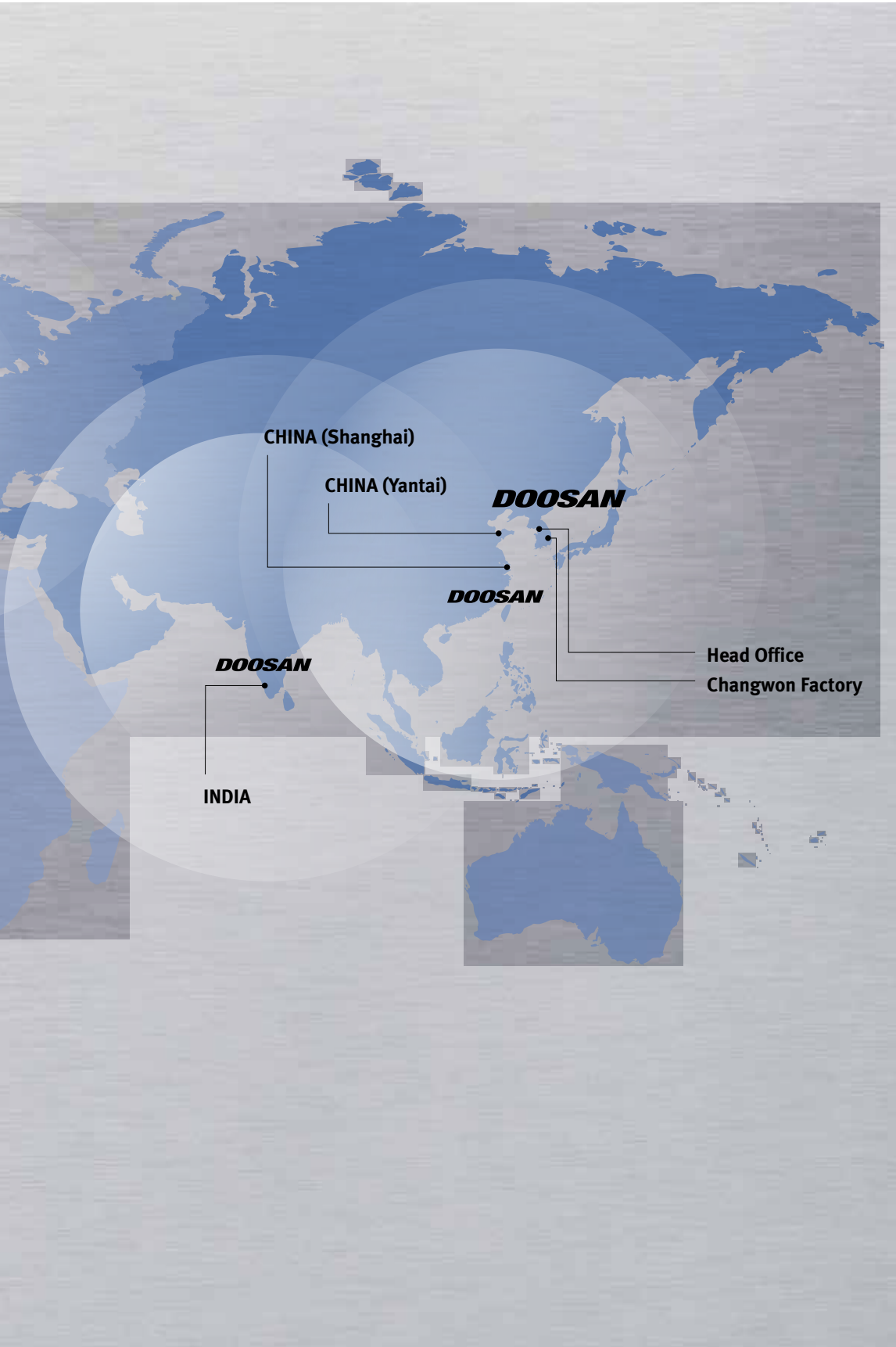
Corporations	Dealer Networks	Technical Centers	Service Post	Factories
4	164	51	198	3

Technical Center: Sales Support, Service Support, Parts Support

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

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands.

By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Customer Support Service

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

Supplying Parts



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

Field Services



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

Technical Support



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

Training



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

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}*	
	Main 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 (lb·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

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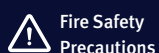
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* For more details, please contact Doosan Machine Tools.

* The specifications and information above-mentioned may be changed without prior notice.

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**Fire Safety
Precautions**

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

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