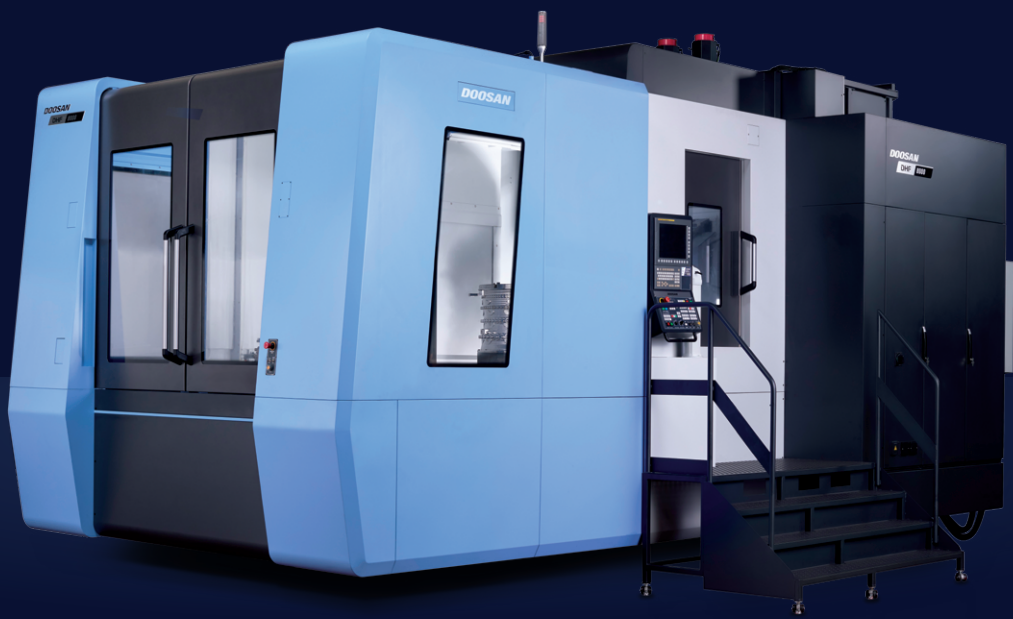
Doosan Machine Tools

SIMULTANEOUS 5 AXIS HORIZONTAL MACHINING CENTER
EQUIPPED WITH A NODDING HEAD SPINDLE

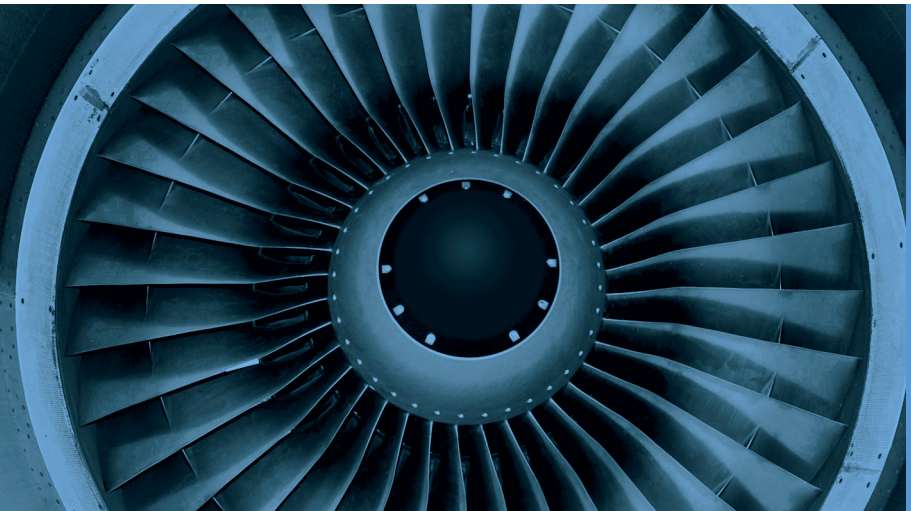
DHF

8000 • 8000ST



DHF SERIES · **8000** · **8000**ST

The DHF 8000 with its A-axis nodding head spindle is a 5- axis simultaneous horizontal machining center with a highly rigid structure and dual ballscrews on its X and Y axes. The DHF 8000 meets the machining requirements of customers machining a range of materials from hard metals, such as Titanium and Inconel, through to the high-speed machining of Aluminium.



The depth and breadth of Doosan's range of vertical and horizontal 5-axis machining centers is second to none. As such, irrespective of whether you are machining small precision medical parts or large aero-engine components, there is a Doosan machine that can more than meet your requirements.

HIGH PRODUCTIVITY, SINGLE SETUP WITH SIMULTANEOUS 5 AXIS MACHINING

- A-axis nodding head spindle
- Travel (x / y / z) : 1450 / 1200 / 1500 mm (57.1 / 47.2 / 59.1 inch)
- Max. Workpiece size : Ø1400 X H1400 mm (Ø55.1 X H55.1 inch)

HIGH RIGIDITY & COMPACT STRUCTURE

- Y/Z dual ballscrew
- Thermal compensation for spindle and structure
- Cooling system
- Linear scale

USER-FRIENDLY FEATURES

- Improved rear exit chip disposal
- Power-pack, multi-step TSC
- Easy chip-disposal through PSC (Programmable Shower Coolant).

MACHINING AREA

Large working envelope with 800 mm pallet size.

Max. Work size

DHF 8000

Ø1400 x H1400 mm

Ø55.1 inch x H55.1 inch

DHF 8000ST

Ø1600 x H1400 mm

Ø63.0 inch x H55.1 inch

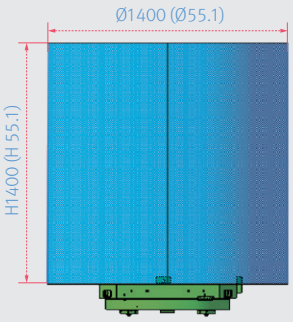
Max. Work weight

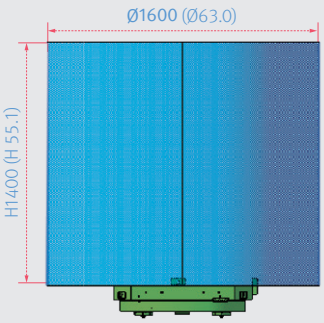
2000 kg

4409.2 lb

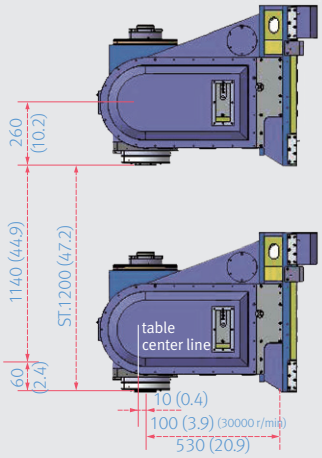
An automatic twin pallet changer is supplied as standard.
Doosan's LPS multi-pallet system is also available as an option.

Units : mm (inch)

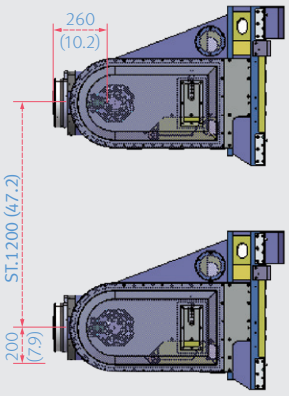




VERTICAL



HORIZONTAL



Pallet size

DHF 8000

800 x 800 mm

31.5 inch x 31.5 inch

DHF 8000ST

Ø1000 mm

Ø39.4 inch

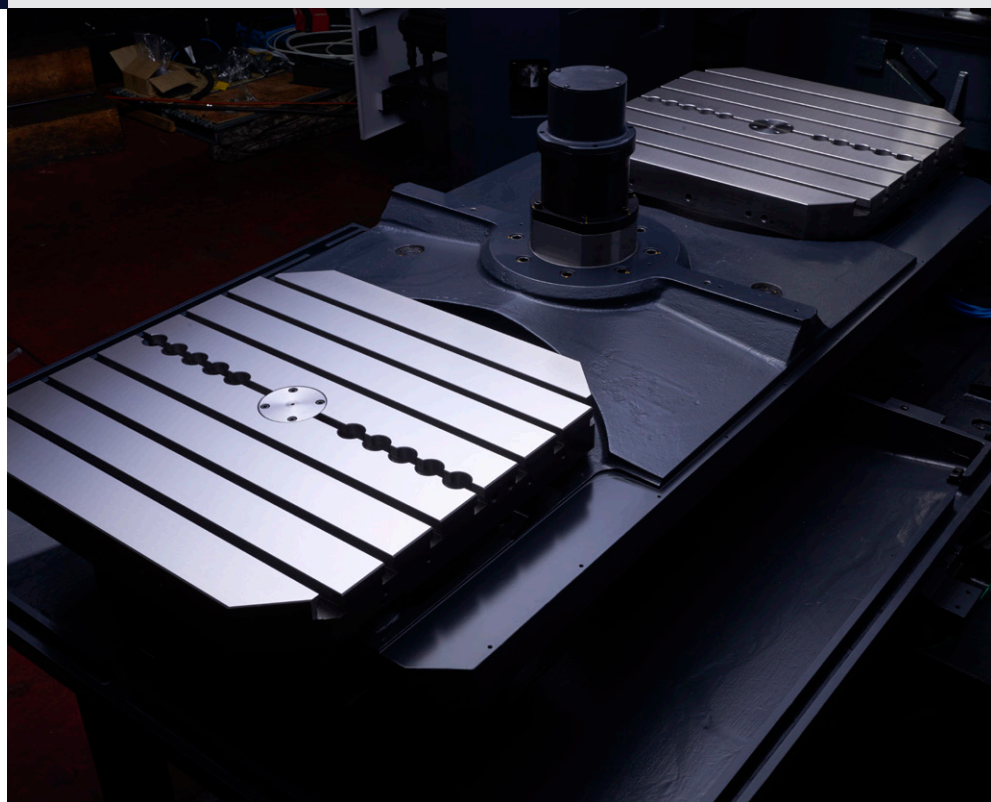
Maximum pallet load

2000 kg

4409.2 lb

Pallet change time

16 sec



BASIC STRUCTURE

To machine high-precision, complex components with intricate shapes and features, DHF 8000 is equipped with A-axis nodding head spindles that facilitate 5-axis simultaneous machining. Dual ballscrews are applied to the X and Y axes to ensure highly-stable machining.

Travel distance

X-AXIS

1450 mm
57.1 inch

Y-AXIS

1200 mm
47.2 inch

Z-AXIS

1500 mm
59.1 inch

Feedrate

X-AXIS

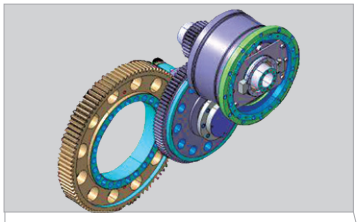
40 m/min
1574.8 ipm

Y-AXIS

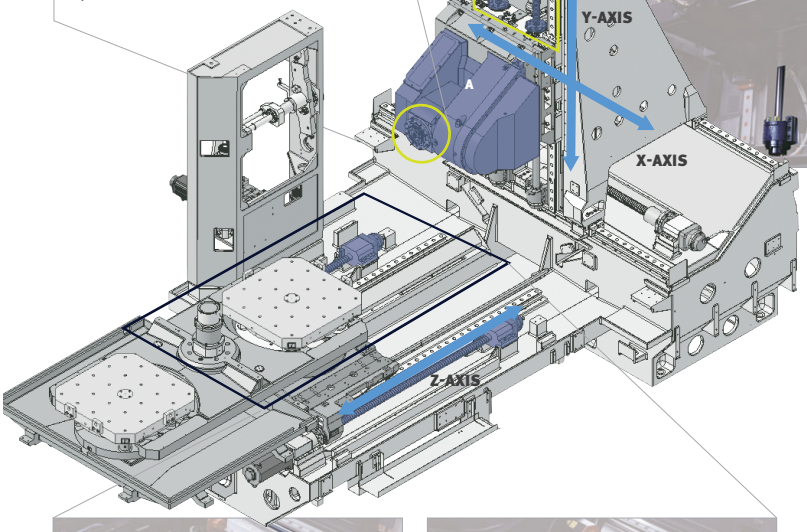
40 m/min
1574.8 ipm

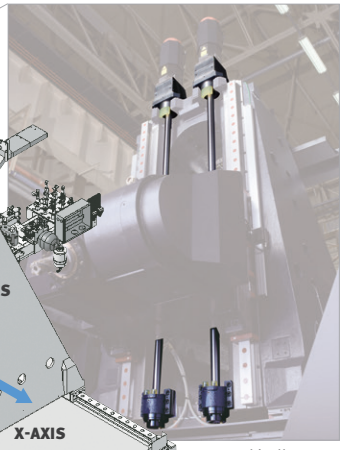
Z-AXIS

50 m/min
1968.5 ipm

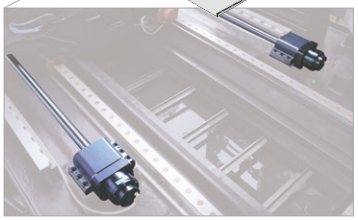


High rigidity gear train spindle head structure

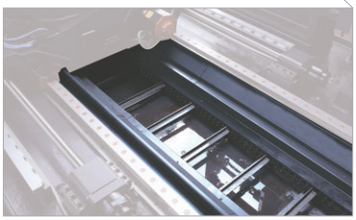




Dual ballscrews on the Y-axis to improve rigidity.

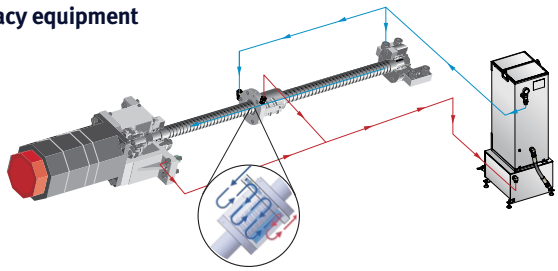


Dual ballscrews on the Z-axis to improve rigidity.



Centrally-positioned chip disposal.

High accuracy equipment



Cooling system

Significantly reduced thermal displacement of the ballscrews.

Linear scales

Maintain high precision over long machining runs and extended operation.

Main Products

Titanium Blisk

Turbine Casing

Fan Disk

Spool

Turbine Component

SPINDLE INFORMATION

Excellent cutting performance is assured by using a 2-step geared spindle for machining hard materials, and a high-speed, built-in spindle for machining Aluminium.

DHF 8000ST

Max Spindle Speed

6000 r/min

HSK only

15000 r/min option

30000 r/min option

PSC(Programmable Shower Coolant) standard

Max Power

FANUC

35 kW
46.9 hp

92/51 kW option
123.4/68.4 hp

SIEMENS

90/86 kW option
120.7/115.3 hp

Max Torque

FANUC

960 N·m
708.5 ft-lb

147/53.4 N·m option
108.5, 39.4 ft-lb

SIEMENS

223/49.9 N·m option
164.6/36.8 ft-lb

Tilt angle (A axis)

–100 ~ 60 deg

Tool shank

DHF 8000

BT 50
HSK A100/A63 option

DHF 8000ST

HSK-T100

CUTTING PERFORMANCE

Impressive machining capability due to machine structure and spindle performance.

Higher Cutting Power

High-rigidity machining can be undertaken with speed and precision.

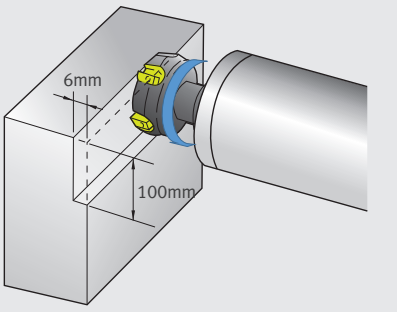
Cutting Capacity

(Motor power : 35/22 kW (46.9/29.5 Hp))

Face milling Carbon Steel (SM45C) [ø125mm Face mill (8Z)]

	Machining rate	Spindle speed	Feed rate
DHF 8000	1020 cm^3/min	348 r/min	1700 mm/min

* The results in the catalogue are provided as examples and should be used as a guide. Different cutting and environmental conditions will deliver different results.



Tool to Tool

3.5 sec

2.4 sec

Max. tool length

550 mm
21.7 inch

Max. tool weight

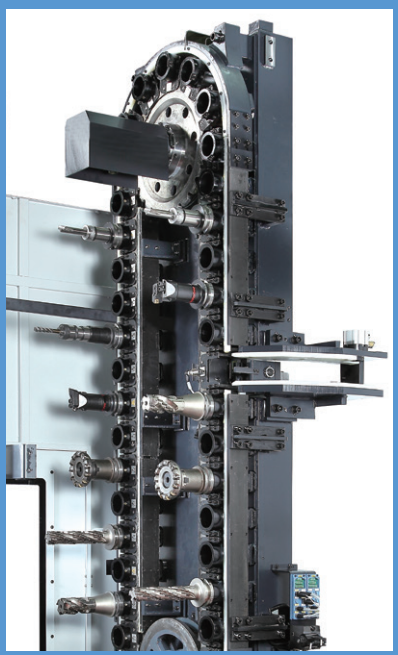
30 kg 66.1 lb

12 kg 26.5 lb
(30000 r/min)

MAGAZINE SPECIFICATIONS

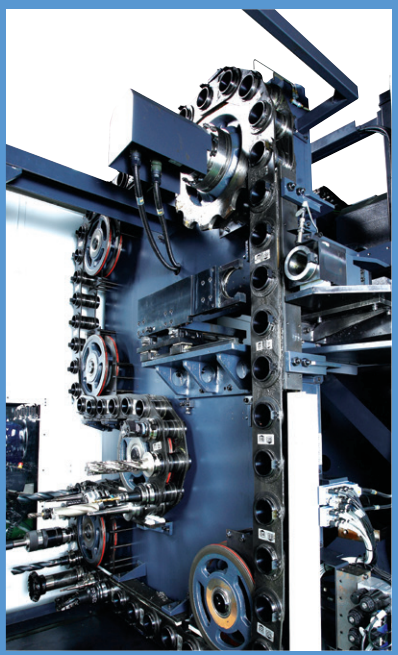
The servo type magazine improves productivity and reliability.

Pot type magazine



30000 r/min 80 / 120 tools

Chain type magazine option



90 / 120 / 150 tools

Matrix type magazine option

196 / 256 / 316 / 376 tools
30000 r/min 171 / 275 tools

STANDARD & OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

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

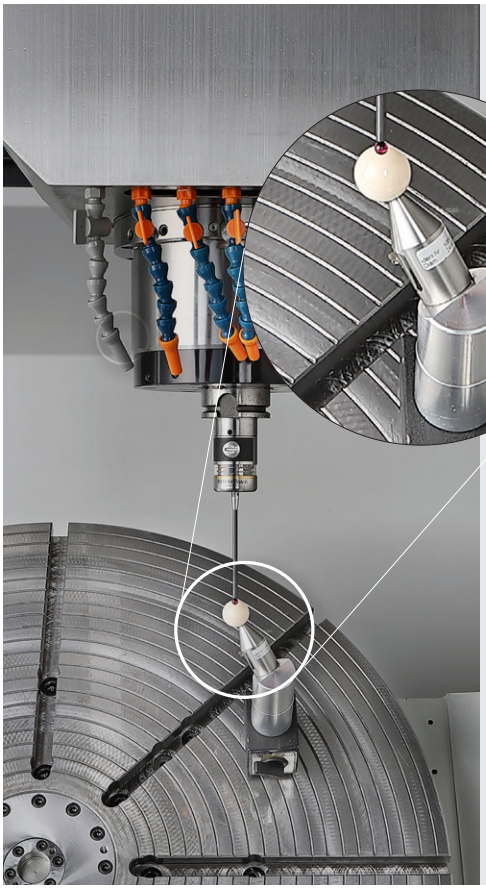
Description	Features		DHF 8000	DHF 8000ST
Spindle	6000 r/min	35 kW (46.9 Hp), 960 N·m (708.5 ft-lbs)	●	●
	15000 r/min(SIEMENS)	86 kW (115.3 Hp), 223 N·m (164.6 ft-lbs)	○	○
	15000 r/min(FANUC)	51 kW (68.4 Hp), 147 N·m (108.5 ft-lbs)	○	○
	30000 r/min(SIEMENS)	90 kW (120.7 Hp), 49.9 N.m (36.8 ft-lbs)	○	○
	30000 r/min(FANUC)	90 kW (120.7 Hp), 53.4N.m (39.4 ft-lbs)	○	○
Magazine	Tool storage capacity	60 ea	●	●
		90 / 120 / 150 / 196~376 ea	○	○
		80ea (30000 r/min only)	●	●
		120 / 171 / 275 ea (30000 r/min only)	○	○
Tool shank type	BIG PLUS BT50		●	●
	BIG PLUS CAT50		○	○
	BIG PLUS DIN50		○	○
	HSK A100		○	○
	HSK A63		○	○
	HSK T100		-	○
Coolant	PSC (Programmable shower coolant) (30000 r/min only)		●	●
	FLOOD		●	●
	FLUSHING		●	●
	PROGRAMMABLE TSC		●	●
	SHOWER		○	○
	Coolant level switch : Sensing level - Low / High		●	●
Chip disposal	Chip conveyor	2-step drum type	●	●
	Chip bucket	Folklift type	○	○
		Rotation type	○	○
	Air blower		○	○
	Air gun		○	○
	Coolant gun		○	○
Precision machining option	Linear scale	X / Y / Z-axis	●	●
	DSQ3 (600 Block, High Process CPU, Data Server 1GB)		●	●
	DSQ4 (1000 Block, High Process CPU, Data Server 1GB)		○	○
	Data Server 2G/4G/16GB		○	○
Measurement & Automation	Automatic tool measurement	TS27R_RENISHAW	●	●
	Automatic workpiece measurement	RMP600_RENISHAW	○	○
Others	LED Work light		●	●
	Signal tower		●	●
	Tool load monitoring		●	●
	EZ Guide i		○	○
	Automatic power off		○	○
Customized Special Option	Spin window for main door (Electric type)		○	○

*Please contact your **Doosan Machine Tools** representative for detailed machine information.*

PERIPHERAL EQUIPMENT

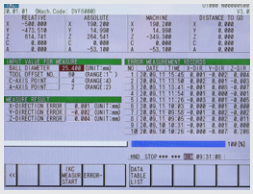
Intelligent Kinematic Compensation for 5-axis machining Recommended Option

For high accuracy 5-axis machining, the Intelligent Kinematic Compensation function is recommended. This function minimizes error in complex 5-axis machining applications by ensuring that the tip of the tool is always in the correct position in relation to the workpiece. In order to take advantage of this function, the following optional items are required.

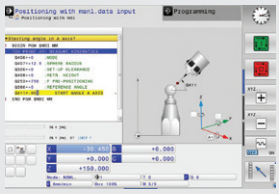


Recommended optional items

1. SOFTWARE



FANUC NC : IKC



HEIDENHAIN NC ; IKC

2. RECEIVER

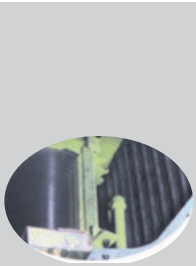
3. TOUCH PROBE option

4. DATUM BALL option

5. MASTER TOOL option

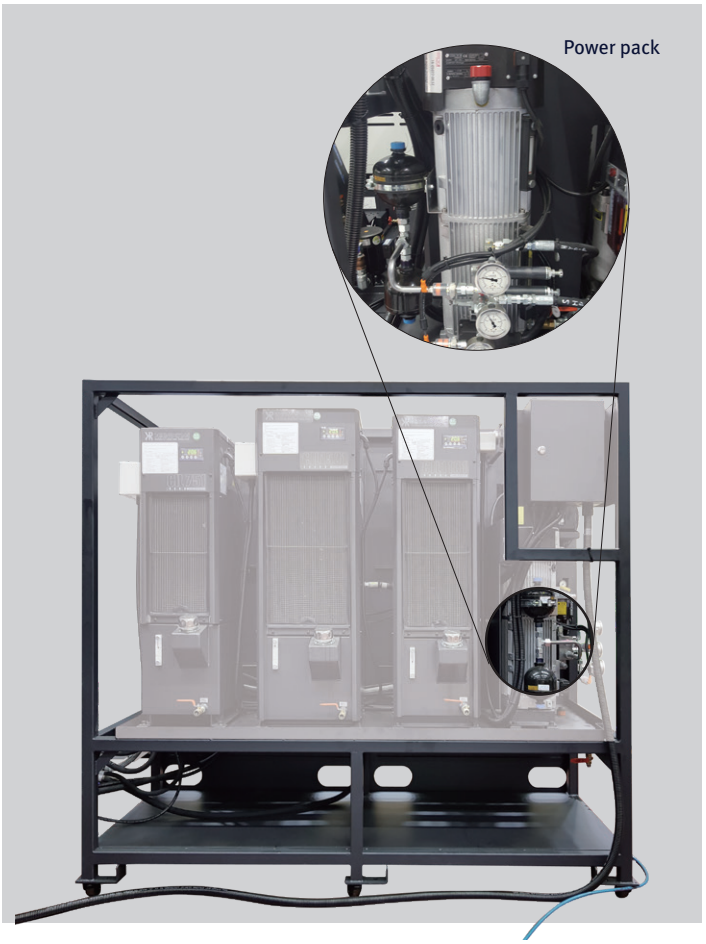
PERIPHERAL EQUIPMENT

Chip Conveyor



2-step drum conveyor

Movable units



Oil skimmer

Mist Collector option

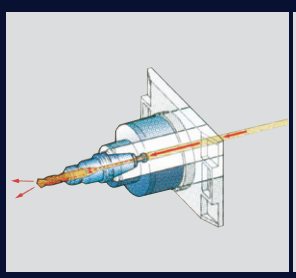
Chip Disposal System

FLUSHING COOLANT

PROGRAMMABLE TSC

SHOWER COOLANT

COOLANT GUN option



MQL(MINIMUM QUANTITY LUBLICATION) SYSTEM
(MISTING DEVICE) option

PROGRAMMABLE SHOWER COOLANT
option 30000 R/MIN STANDARD

CONVENIENT OPERATION

Fanuc 31i5

User-Friendly Operation Panel

With the world's highest level of performance, the FANUC 31i5 is the core FANUC CNC system. Featuring an array of functions and advanced control technologies, the 31i5 is the ideal control for high-performance lathes and machining centers. Leading-edge hardware has enhanced the basic performance of the CNC, servos and the PMC to support advanced CNC functionality and operation. The end result is an intuitive, fast and vastly improved operator experience.

Design optimized for customers' needs based on our extensive know-how	
Designed for user convenience	• Convenient and intuitive UI • Optimized button size • High-visibility lamps • Long life cycle 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

NUMERIC CONTROL SPECIFICATIONS

FANUC

	Item	Specifications	F31iB5 DHF 8000
Controlled axis	Controlled axes		5 (X,Y,Z,C,A) (X,Y,Z,C,B)
	Simultaneously controlled axes		5 axis
	Additional controlled axis	Add 1 Axis (5th Axis)	●
Data input/output	data server		●(1GB)
	Memory card input/output		●
	USB memory input/output		●
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	●
Feed function	AI contour control I	G5.1 Q_, 40 Blocks	X
	AI contour control II	G5.1 Q_, 200 Blocks	X
	AI contour control II	G5.1 Q_, 600 Blocks	●
	AI contour control II	G5.1 Q_, 1000 Blocks	○
	High smooth TCP		●
Operation Guidance Function	EZ Guide i		○
	iHMI with machining cycle	Note *1) Only with 15" Touch LCD standard	X
	EZ Operation package		●
Setting and display	CNC screen dual display function		●
Network	FANUC MTConnect		✪
	FANUC OPC UA		✪
Others	Display unit	15" color LCD	●
		15" color LCD with Touch Panel	○
	Part program storage size & number of registerable programs	640M(256KB)_500 programs	●
		1280M(512KB)_1000 programs	○
		2560M(1MB)_1000 programs	○
		5120M(2MB)_1000 programs	○
		10240M(4MB)_1000 programs	○
		20480M(8MB)_1000 programs	○
		2560M(1MB)_2000 programs	X
		5120M(2MB)_4000 programs	X
		10240M(4MB)_4000 programs	X
		20480M(8MB)_4000 programs	X

Network: FANUC MTConnect and FANUC OPC UA available.

● *Standard* ○ *Optional* X *Not Available* ✪ *Available*

FANUC EASY OPERATION PACKAGE

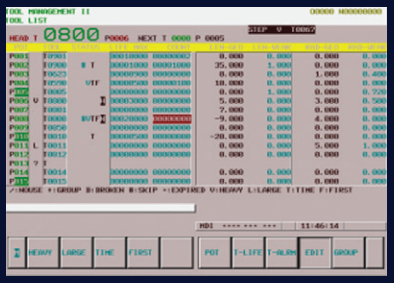
The software developed by Doosan features numerous functions designed for convenience and ease of operation.

Easy Operation Package (EOP)

The EOP 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. EOP reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.

Tool management I

- Tool magazine control
- Tool state display
- Fastems Tool Add/Remove Function option

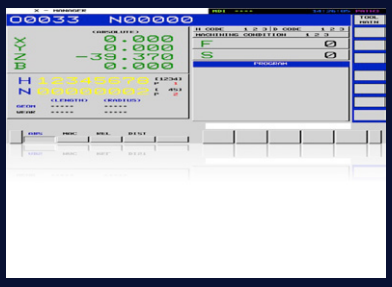


Tool management II option

- Tool magazine control
- Tool life management
- Tool life prediction
- Tool state control
- Balluff Tool ID function

Tool load monitor

- Detection of tool damage
- Detection of abnormalities during operation
- Detection of no-load air cutting

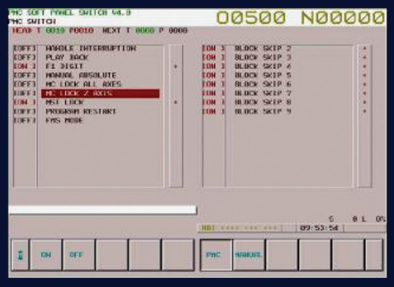


X MANAGER

- 8Digits T Call
- Tool Management function
- TOOL ID available • Tool Pre-setter available
- Toyoda tool ID acceptable

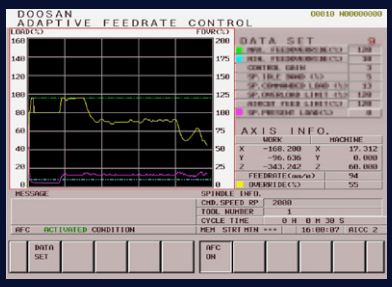
Operation rate

- Measure various machine operating rate
- Support 3 shift operation
- calculate and save 30 days operating rate
- Show data for a specific period



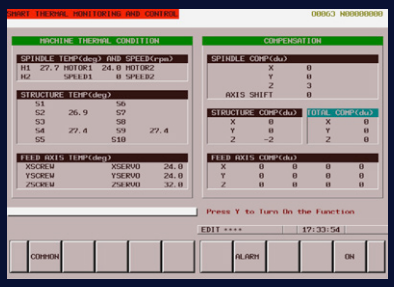
PMC switch

- Operation panel function option
- Substitutes toggle switches
- NC option software



DAFC

DAFC function adjusts uniform machining load to prevent tool damage and improve machining efficiency.



Smart Thermal Compensation

Smart Thermal Compensation function receives data from several sensors and calculates the appropriate compensation required.

CONVENIENT OPERATION

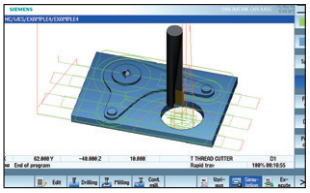
Siemens 840D

15.6” Screen + New Operation Panel

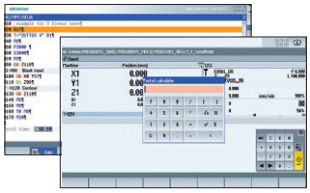
The newly-designed operation panel improves the customer convenience by incorporating and using common-design buttons and layouts, and includes the familiar QWERTY keyboard for fast and easy operation.

- 15.6" display
- 10MB high capacity user memory
- USB & ethernet (standard)
- QWERTY keyboard (standard)
- High-speed calculation and simulation can be fulfilled by improved processor functionality

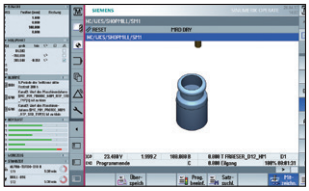
Conversational Convenient Function



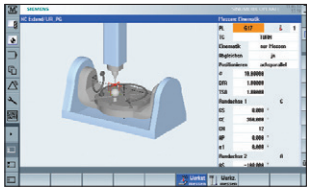
Simulation and Machining Contour Monitoring



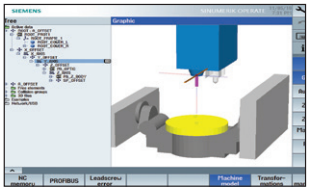
Smart Function



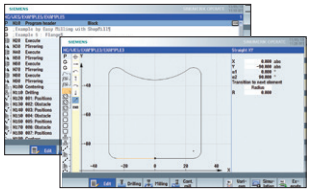
Side Screen Widget



5-axis Kinematic Measuring Cycles



3D Collision Avoidance and Collision Avoidance ECO



Shop Mill Part Programming

NUMERIC CONTROL SPECIFICATIONS

SIEMENS

	Item	Specifications	S840Dsl DHF 8000
Controlled axis	Controlled axes	5 axes	●
	Simultaneously controlled axes	5 axes	●
Data input/output	Memory card input/output	(Local drive)	●
	USB memory input/output		●
Interface function	Ethernet	(X130)	●
Operation	On network drive	(without EES option, Extcall)	●
	On USB storage medium, e.g. memory stick	(without EES option, Extcall)	●
Program input	Workpiece coordinate system	G54 - G57	●
	Addition of workpiece coordinate system	G505 - G599	●
Interpolation & Feed function	Advanced surface		○
	Top surface		●
	Look ahead number of block	S/W version 4.8	1000
Programming & Editing function	3D simulation, finished part		●
	Simultaneous recording		●
	Measure kinematics		●
	DXF Reader for PC integrated in SINUMERIK Operate		○
Operation Guidance Function	ShopMill		●
	EZ Work		●
Setting and display	Operation via a VNC viewer		●
Network	MTConnect		✪
	OPCUA		○
Etc. function	15.6" color display with touch screen		●
	19" color display without touch screen		○
	21.5" color display with touch screen		○
	CNC user memory	10 MB	●
	Expansion by increments	2 ~ 12 MB	○
	Collision avoidance		○
	Collision avoidance ECO (machine, working area)		○

● *Standard* ○ *Optional* X *Not Available* ✪ *Available*

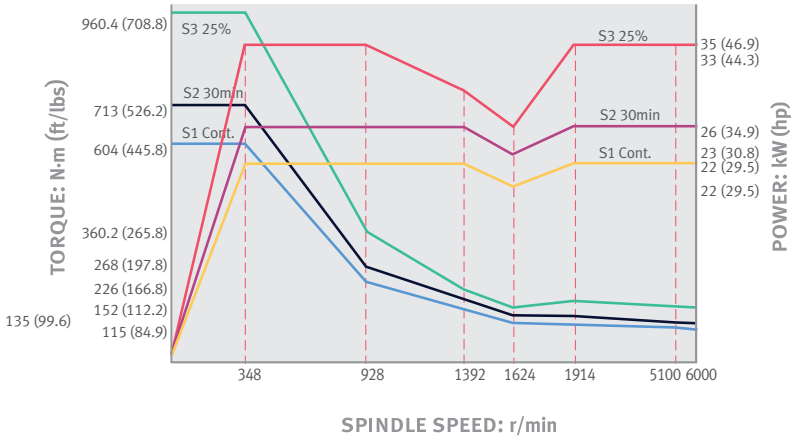
POWER & TORQUE

DHF 8000/8000ST

6000 r/min FANUC

Power : 35 kW (46.9 Hp)

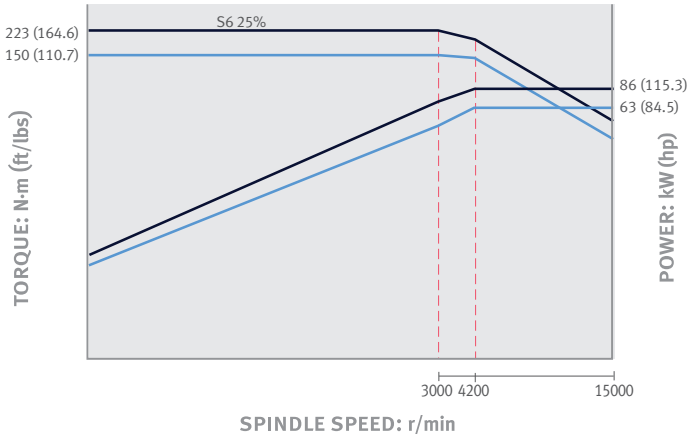
Torque : 960.4 N·m (708.8 ft-lbs)



15000 r/min SIEMENS option

Power : 86 kW (115.3 Hp)

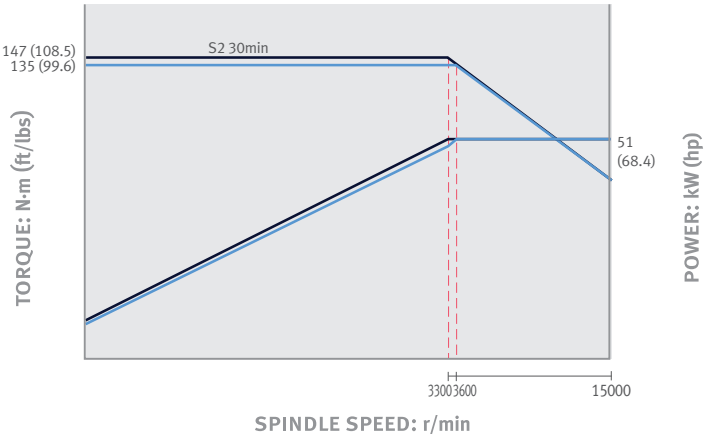
Torque : 223 N·m (164.6 ft-lbs)



15000 r/min FANUC option

Power : 51 kW (68.4 Hp)

Torque : 147 N·m (108.5 ft-lbs)

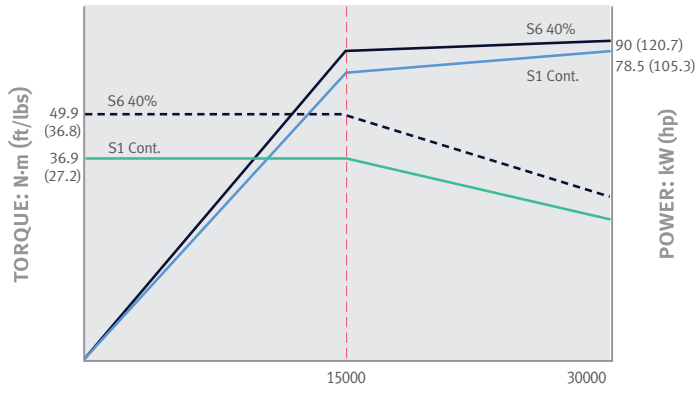


DHF 8000_30000 r/min

30000 r/min SIEMENS option

Power : 90 kW (120.7 Hp)

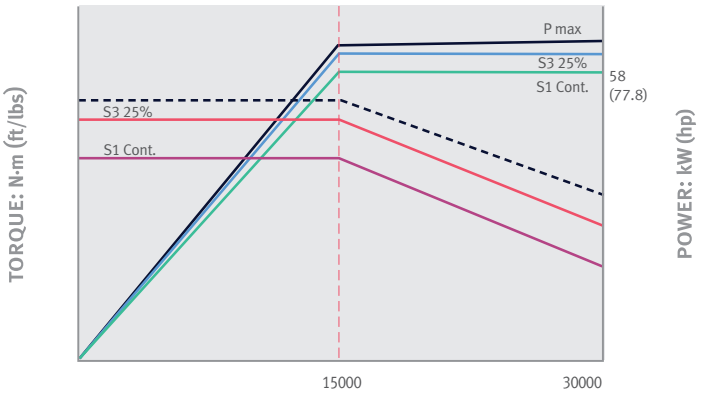
Torque : 49.9 N·m (36.8 ft-lbs)



30000 r/min FANUC option

Power : 90 kW (120.7 Hp)

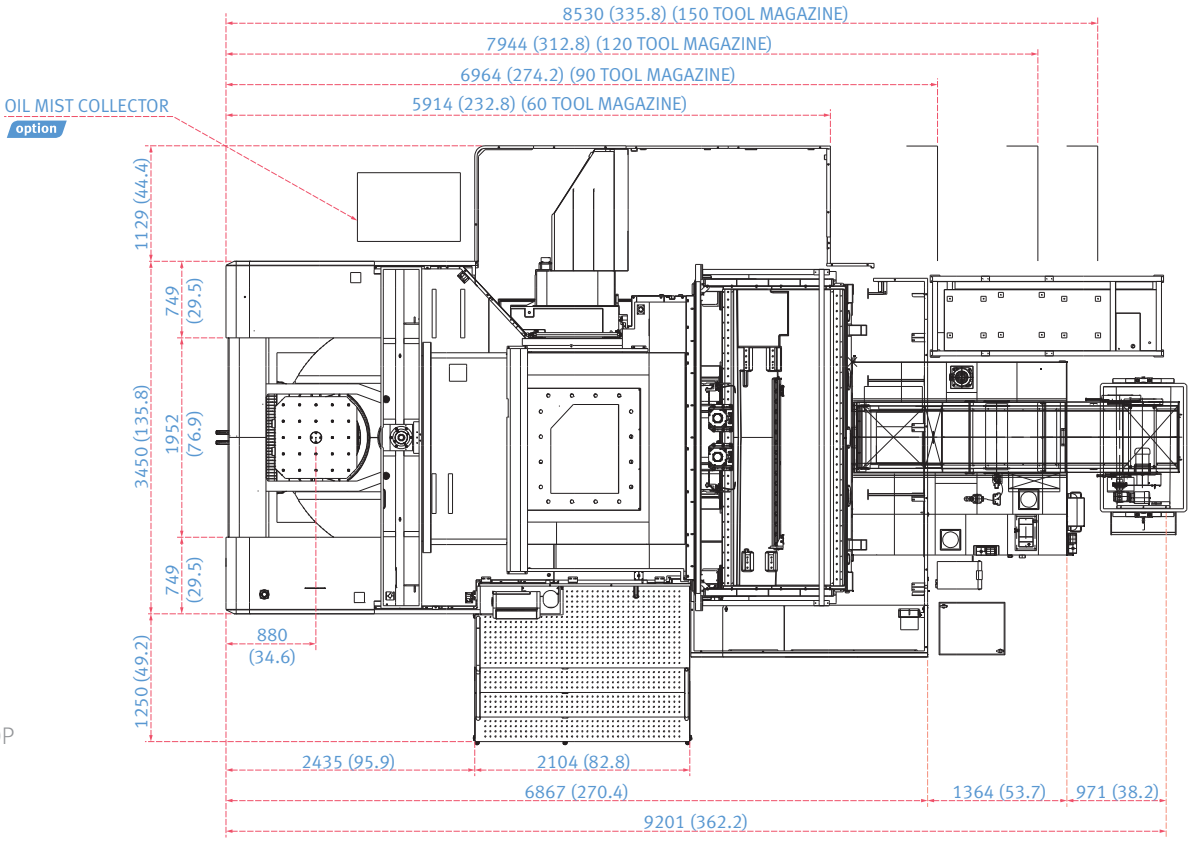
Torque : 53.4 N·m (39.4 ft-lbs)



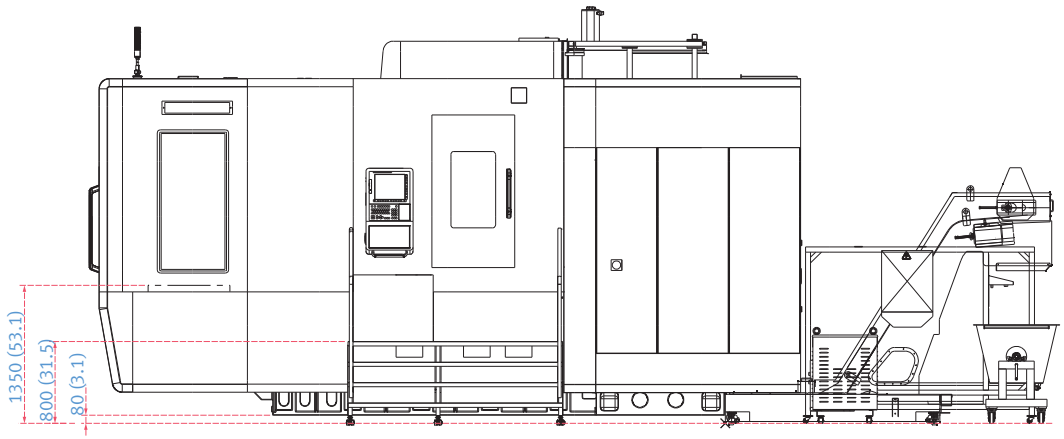
DIMENSIONS

DHF 8000

TOP



SIDE



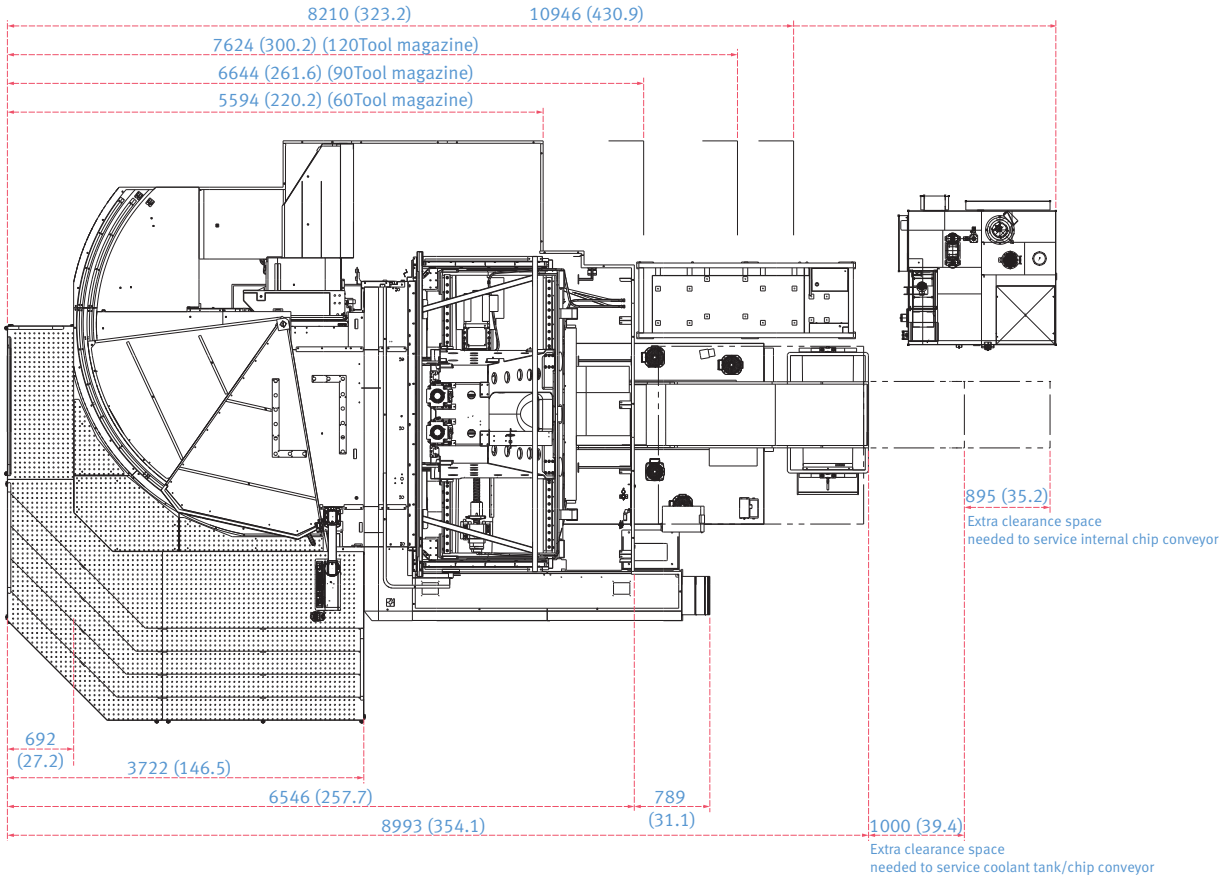
* Some peripheral equipment can be placed in other areas.

DIMENSIONS

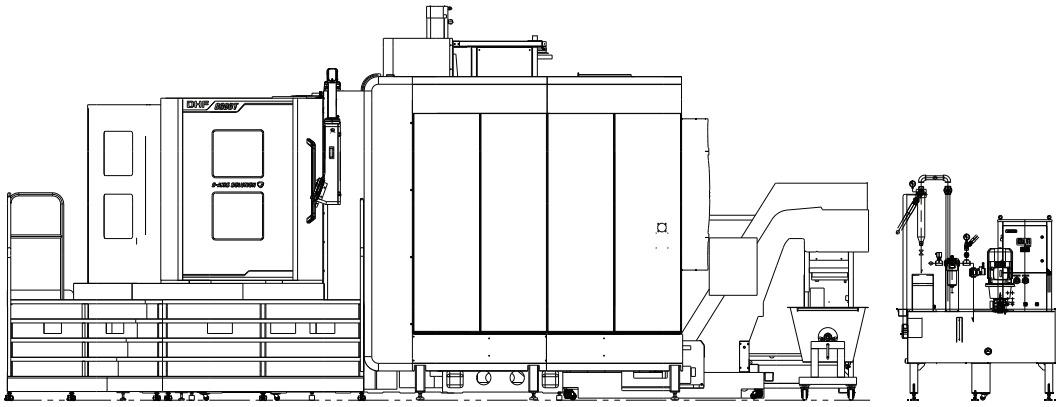
DHF 8000ST

Units : mm (inch)

TOP



SIDE

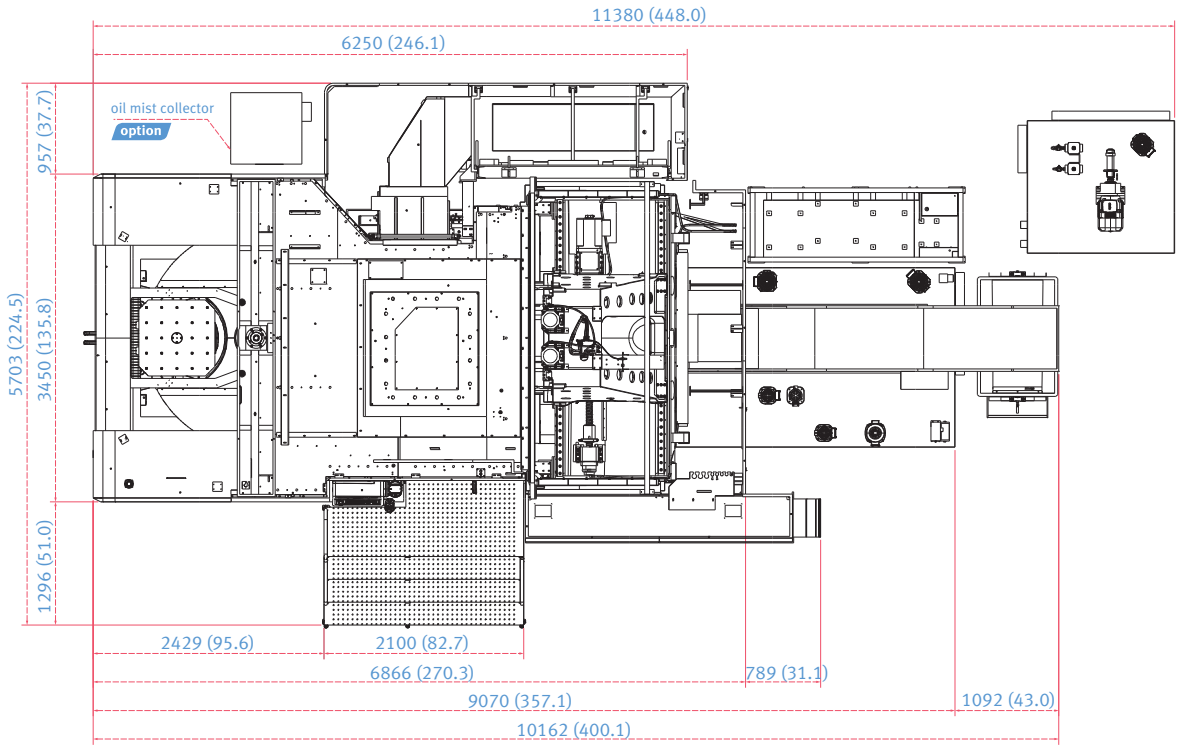


* Some peripheral equipment can be placed in other areas.

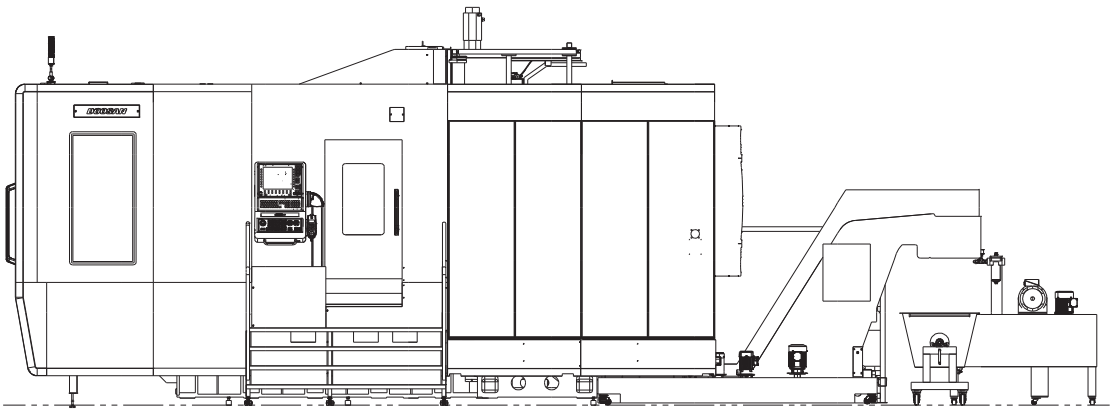
DIMENSIONS

DHF 8000 30000r/min / PSC

TOP



SIDE



* Some peripheral equipment can be placed in other areas.

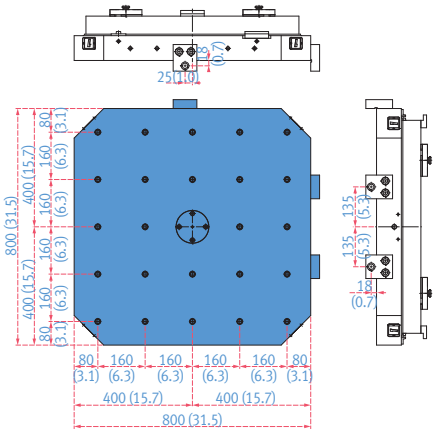
PALLET | WORING AREA

DHF 8000

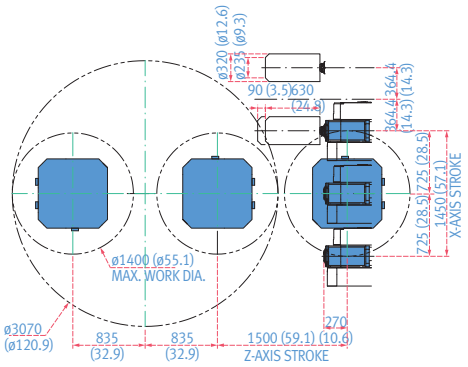
Units : mm (inch)

PALLET

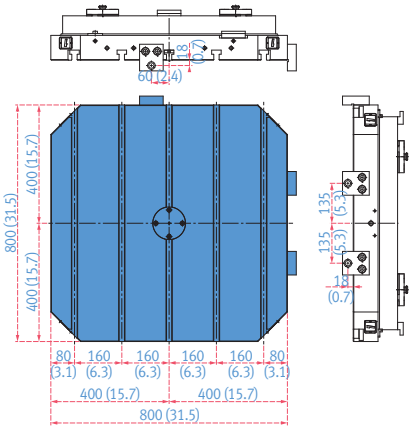
TAP



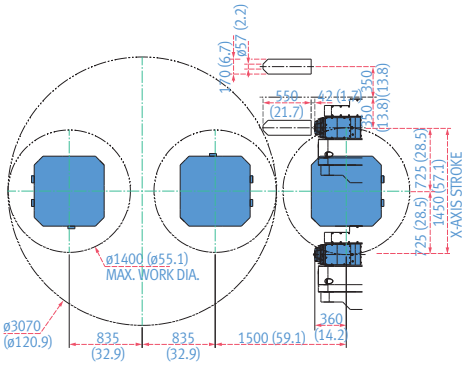
WORKING AREA



T-SLOT



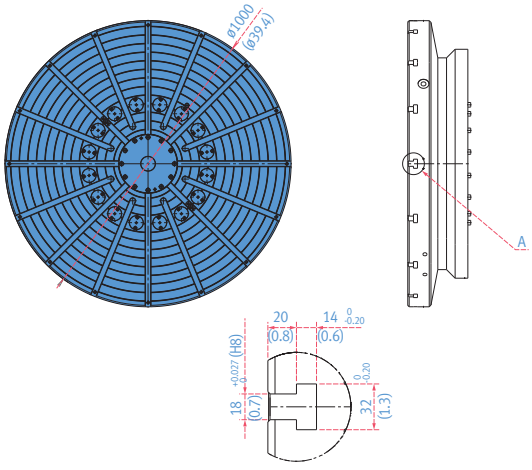
30000 r/min



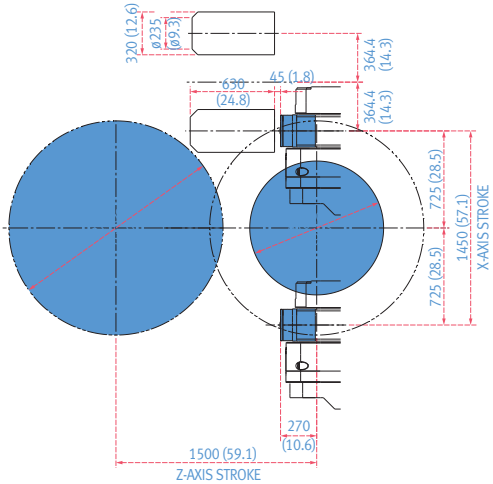
DHF 8000ST

Unit: mm (inch)

PALLET



WORKING AREA



MACHINE SPECIFICATIONS

DHF 8000 • 8000ST

Description			Unit	DHF 8000/8000ST	DHF 8000 30000r/min / PSC
Travel	Travel distance	X-axis	mm (inch)	1450 (57.1)	
		Y-axis	mm (inch)	1200 (47.2)	
		Z-axis	mm (inch)	1500 (59.1)	
	Spindle nose to table center		mm (inch)	-270 ~ 1230 (-10.6 ~ 48.4)	
	Distance from spindle nose to table top		mm (inch)	200 ~ 1400 (7.9 ~ 55.1)	
Table	Pallet size		mm (inch)	800 x 800 (31.5 x 31.5), ø1000 (ø39.4)**	
	Workpiece size		mm (inch)	Ø1400 x H1400 (Ø55.1 x H55.1), Ø1600 x H1400 (Ø63.0 x H55.1)**	
	Maximum workpiece weight		kg (lb)	2000 (4409.2)	
	B-AXIS ROTATING SPEED**		r/min	8 (500**)	
Spindle	Max. spindle speed		r/min	6000 {15000, 30000}*	
	Taper		-	BT50, HSK A100, HSK T100**	HSK A63
	Max. Spindle motor power		kW (Hp)	35 {86, 51}* (46.9 {115.3, 68.4})*	90 (120.7)
	Max. spindle torque		N·m (ft-lbs)	960 {223, 147} (708.5 {164.6, 108.5})*	53.4, 49.9 (39.4, 36.8)
	A-axis tiling angle		deg	-100 ~ 60	
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)	50 (1968.5)	
Automatic Tool Changer (ATC)	Tool storage capacity		ea	60 {90, 120, 150, 196 ~ 376}*	80 {120, 171, 275}*
	Max. tool diameter	Continous	mm (inch)	125 (4.9)	75 (3.0)
		Without Adjacent Tools	mm (inch)	320 (12.6)	170 (6.7)
	Max. tool length		mm (inch)	550 (21.7)	
	Max. tool weight		kg (lb)	30 (66.1)	12 (26.5)
	Max. tool moment		N·m (ft-lbs)	34.3 (25.3)	11.8 (8.7)
	Tool change time (Tool-to-tool)		sec	3.5	2.4
Machine Dimensions	Height		mm (inch)	4075 (160.4)	
	Length		mm (inch)	11835 (465.9)	
	Width		mm (inch)	5830 (229.5)	
	Weight		kg (lb)	31000 (68342.3)	
Control	CNC system		-	DOOSAN FANUC 31iB5 {SIEMENS 840D}*	

*{ } : Option
** Only DHF 8000ST

WHY 5-AXIS MACHINING?

Single Setup Efficiency

5-axis machining allows you to approach the workpiece from all angles, with complete access to five sides of the part in a single setup. This reduces the overall number of part setups compared to traditional machining, which minimizes machine downtime and maximizes chip making time.

Improved Part Accuracy

When making parts with multi-sided features using traditional 3-axis machining, multiple part setups are required. This means new inaccuracies can arise each time the workpiece is repositioned. 5-axis machining eliminates stacked tolerances and improves overall part dimensional accuracy.

Extended Machine Shop Capability

Doosan 5-axis machines open up new doors for your machine shop. The increased efficiency will make you instantly more competitive, and full 5-axis machining capabilities give you the opportunity to quote on jobs that previously weren't possible. So, what are you going to make today?

"Compared with similar machines from Japan or Europe, Doosan has the same level of precision and quality at a better value for money."

*– **OMGM Group**, Italy*

"Our Doosan 5-axis is making complex, high precision parts for aerospace and defense. Cycle times have been reduced dramatically."

*– **Aerotech Precision Manufacturing**, Great Britain*

WHY DOOSAN?

The Doosan promise, MACHINE GREATNESS, has two important meanings. The first is simple: Doosan makes great machines. The second is a challenge to our end-users. With a product line that is this comprehensive, accurate and reliable, we equip our customers to machine greatness.

The big question: ***Why should you choose Doosan over other options?*** Here's why...

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

UNBEATABLE MACHINES

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

READY-TO-MOVE GLOBAL INVENTORY

Machining, turning and 5-axis—with generous standard performance options—are ready to install now.

ROBUST PRODUCT LINE

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

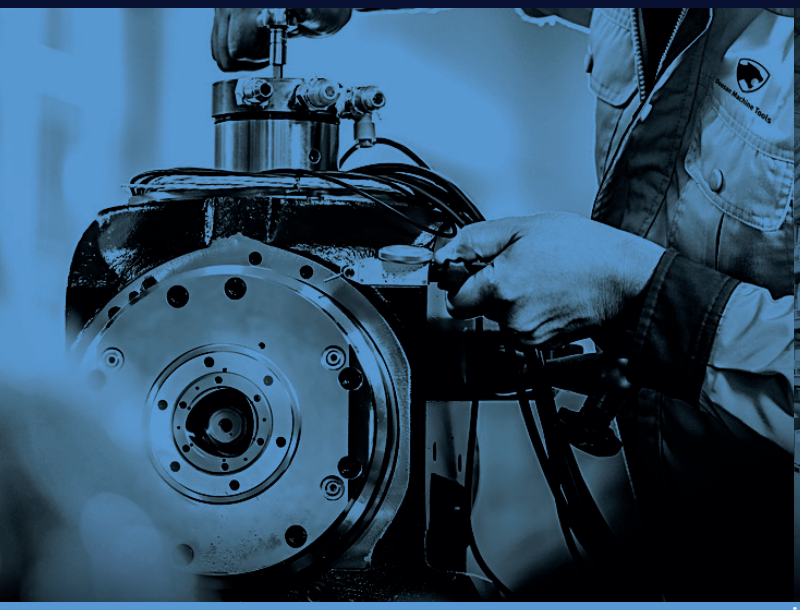
EXPERT SERVICE

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

CUSTOMER SUPPORT AND SERVICES

We're there for you whenever you need us.

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



FIELD SERVICES

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

PARTS SUPPLY

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

TRAINING

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

TECHNICAL SUPPORT

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

RESPONDING TO CUSTOMERS
ANYTIME, ANYWHERE

Doosan Machine Tools' Global Network

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

Global Sales and Service Support Network

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

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sales@doosanmt.com

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*Specifications and information contained within this catalogue 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 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.

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