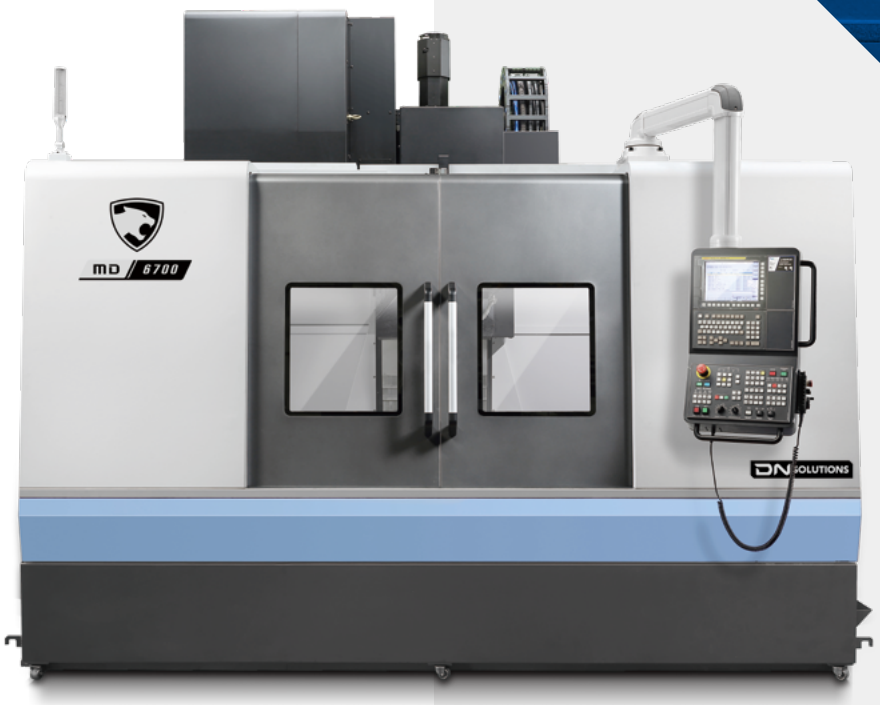
DN SOLUTIONS

NEXT GENERATION DIE & MOLD MACHINING CENTER

MD 6700



MD6700

The new DN Solutions MD 6700 Die & Mold vertical machining center delivers high performance, increased accuracies and unrivalled reliability. To ensure and optimize stability and precision, functions such as thermal compensation and spindle and ball screw cooling are all included as standard. In addition, the MD 6700, despite its compact footprint has a large working envelope and provides the ultimate solution for Die and Mold applications.

CONTENTS

HIGH PRODUCTIVITY SPECIFICATION

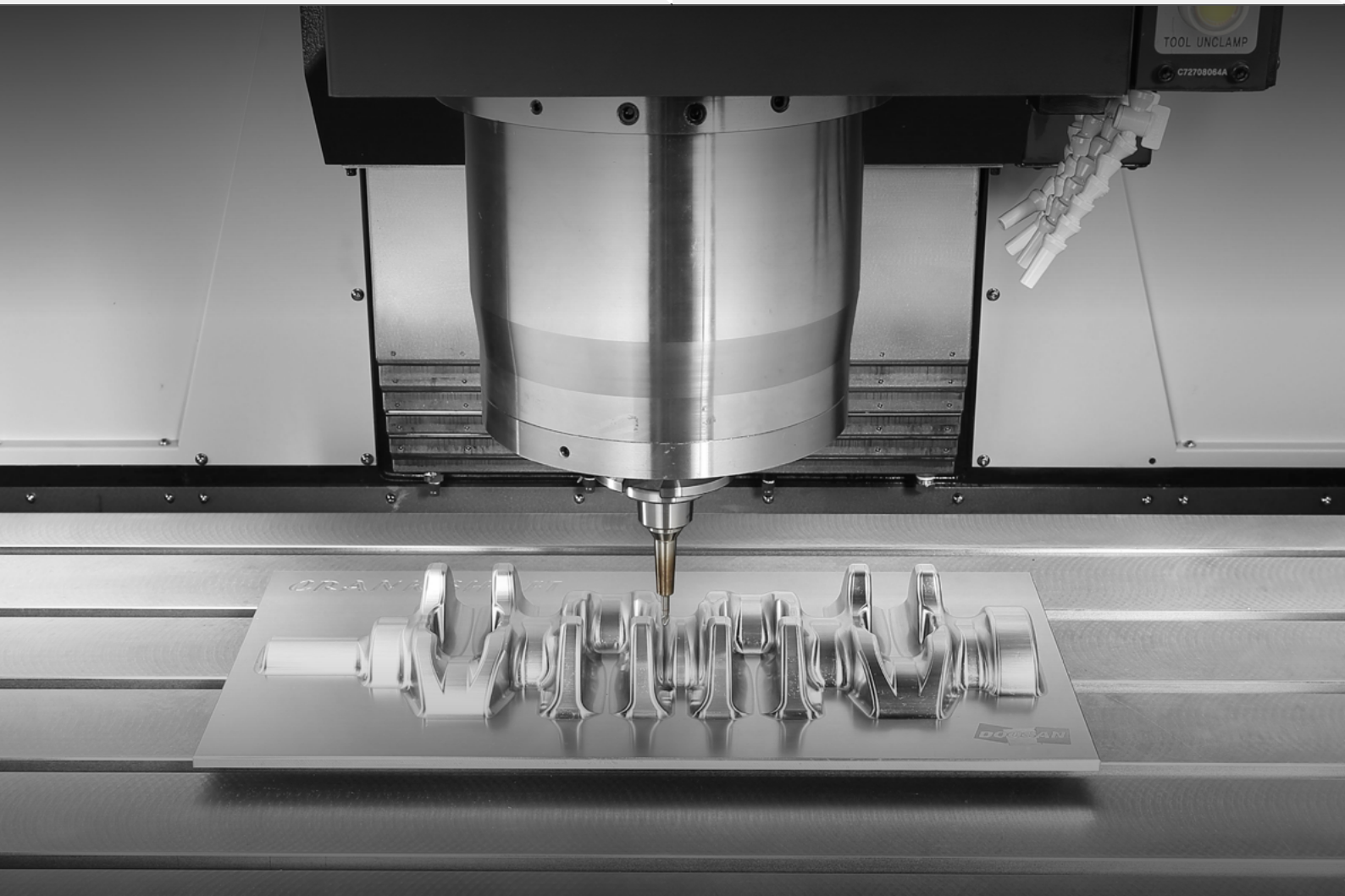
- For maximum productivity, a range of different spindle and servo-driven tool magazine options are available.
- High-speed built-in type spindles
- High-torque gear driven spindles for heavy duty cutting – (8000 r/min - 958 N-m).

HIGH PRECISION MACHINING

- A Y-axis hybrid guideway structure(Box and LMG) is applied to improve accuracy.
- Spindle and structural thermal compensation together with spindle and ball screw shaft cooling systems are included as standard.

COMPACT AND HIGHLY RIGID STRUCTURE

- Small machine footprint
- Machine structure is made from a highly rigid grade of cast iron



BASIC STRUCTURE

The machines, with their highly rigid castings and optimized structural design and build, are incredibly stable.

Travel distance

X axis
1300 mm (51.2 inch)

Y axis
670 mm (26.4 inch)

Z axis
670 mm (26.4 inch)

Rapid traverse rate

X axis
24 m/min (944.9 ipm)

Y axis
24 m/min (944.9 ipm)

Z axis
24 m/min (944.9 ipm)

Ultimate precision is ensured via the incorporation of standard features that include:

. Cooling system (spindle and ball screw assembly)
. Spindle and structural thermal compensation system

Hybrid Y-axis guideway for maximum accuracy and rigidity

Table

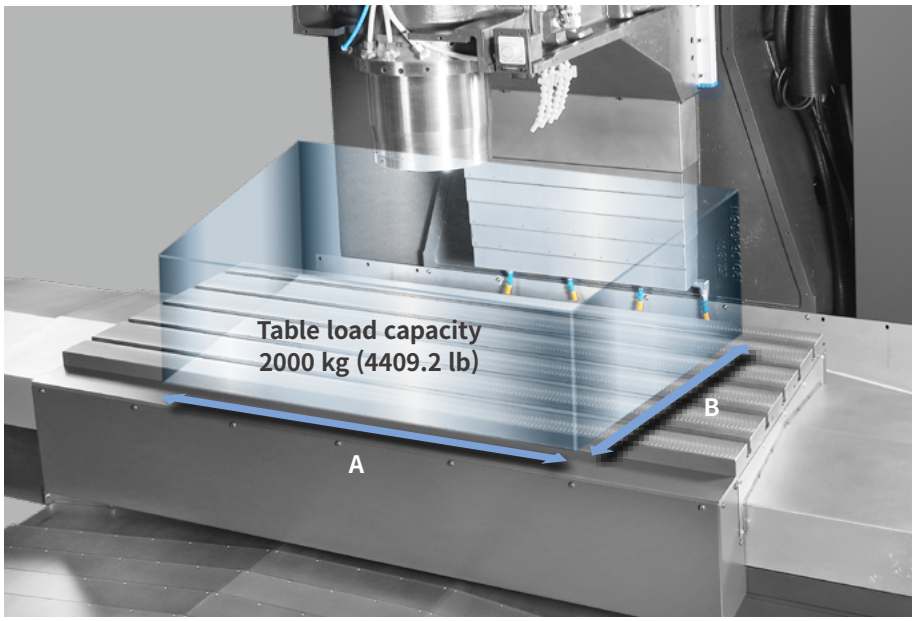
Maximizing cutting area & work load capacity.

Table size (A x B)

1500 x 670 mm
(59.1 x 26.4 inch)

Table load capacity

2000 kg (4409.2 lb)



SPINDLE | MAGAZINE

To satisfy different machining requirements, both built-in and gearbox spindle options are available.

Max. spindle speed

12000 r/min
8000 r/min OPTION

Max. spindle motor power

30 / 30 kW OPTION
(40.2 / 40.2 Hp)

Max. spindle motor torque

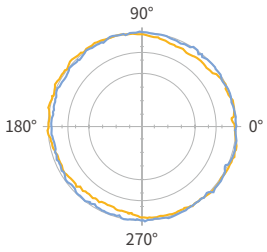
419.4 / 958.1 N·m OPTION
(309.5 / 707.1 ft-lbs)

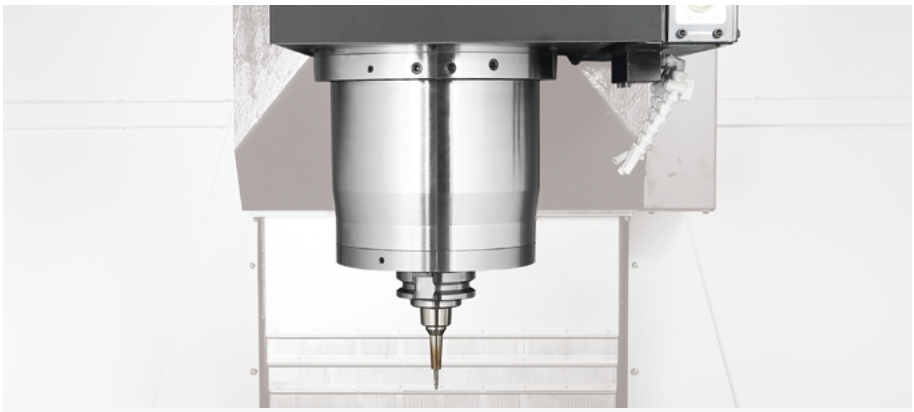
Cutting Performance

The MD 6700 delivers the best cutting performance in its class to optimize productivity.

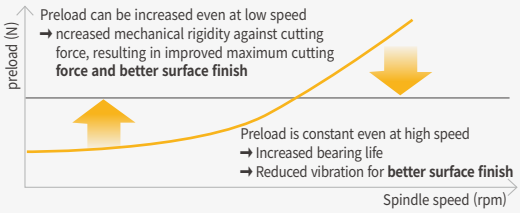
Roundness

2.5 µm





The MD 6700 can be supplied with a built-in spindle with a static pressure structure that improves cutting performance (roughing and finishing) to ensure best in-class mold machining.



High Productivity

Engine Cover

Material	HP4M
Options	TS27R, MQL, MOLD Package
Run hours	37 hours
Cutting conditions	• 10 mm ball endmill • Spindle speed 6200 r/min • Feedrate 1500 mm/min

** The results, indicated in this catalogue, are provided as examples only. They may not always be achieved owing to different cutting and environmental conditions.*

Magazine

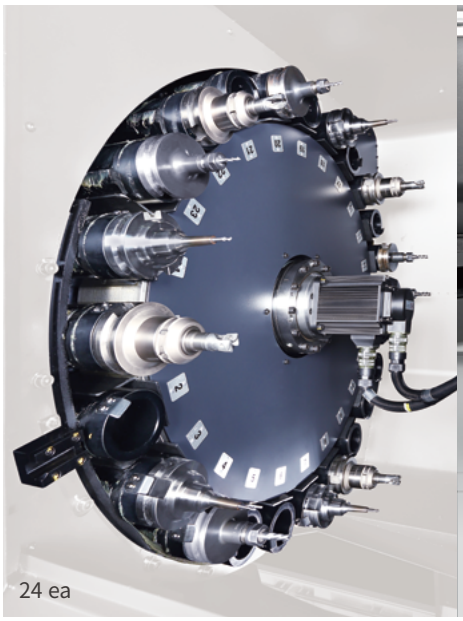
Servo-type tool magazines are included as standard for high productivity and reliability.

Tool storage capacity

24 ea / **30** ea OPTION

T-T-T | C-T-C

2.7 sec | **5 .5** sec


24 ea


* Servo-type tool magazine ensures machining stability when changing tools during machining.

STANDARD | OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

Description	Features		MD 6700
Spindle	12000 r/min (Built in)	30 kW (40.2 Hp), 419.4 N·m (309.5 ft-lbs)	●
	8000 r/min (Gear Box)	30 kW (40.2 Hp), 958.1 N·m (707.1 ft-lbs)	○
Tool shank type	BIG PLUS BT50		●
	BIG PLUS CAT50		○
	BIG PLUS DIN50		○
Magazine	Tool storage capacity	24 ea	●
		30 ea	○
Coolant	FLOOD	0.15(0.1) MPa, 1.1 kW	●
		0.2(0.1) MPa, 1.8 kW	○
	TSC	None	●
		2.0(1.9) MPa, 1.5 kW	○
		2.0(1.3) MPa, 4.0 kW	○
		3.0(3.0) MPa, 2.9 kW	○
		7.0(7.0) MPa, 7.5 kW	○
	SHOWER		○
	Coolant level switch : Sensing level - Low / High**		○
Chip disposal	Chip conveyor	Chip pan	●
		HINGED BELT TYPE or MAGNETIC SCRAPER TYPE	○
	Chip bucket	Forklift type / 300	○
		Rotary type / 300	○
	Air gun		○
	Coolant gun		○
Precision machining option	Linear scale	X / Y / Z axis	○
Measurement & Automation	Automatic tool measurement	TS27R-RENISHAW	○
		OTS-RENISHAW	○
		NC4-RENISHAW	○
	Automatic front door with safety device	OMP60-RENISHAW	○
Others	LED Work light		●
	3 Color signal tower		●
	EZ Guide i		○
	WORK & TOOL COUNTER		○
	TEST BAR : BT 50		○
Customized Special Option	ATC AUTO SHUTTER		○
	ANCHORING	J-BOLT	○
	Water soluble Coolant Chiller***		○
	AUTO TOOL BREAKAGE DETECTION	MAKER/SPEC.-OMRON / D5A	○
		MAKER/SPEC.-NEEDLE	○
	4TH AXIS PREPARATION CABLING FOR SERVO/ 1-PNEUMATIC PIPING	FACTORY READY MADE	○
	4TH AXIS WITH CNC R.TABLE	AVAILABLE SIZE-Φ500	○
		SERVO MOTOR: DEPENDS ON THE TABLE	○
	5TH AXIS	AVAILABLE SIZE-USER DEFINED	○
		SERVO MOTOR-USER DEFINED	○
	HARD-TO-CUT MATERIAL CUTTING PACKAGE	X/Y-AXIS POWER-UP, MIDDLE PRESSURE FLOOD COOLANT, HIGH TORQUE GEAR DRIVEN SPINDLE	○

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

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

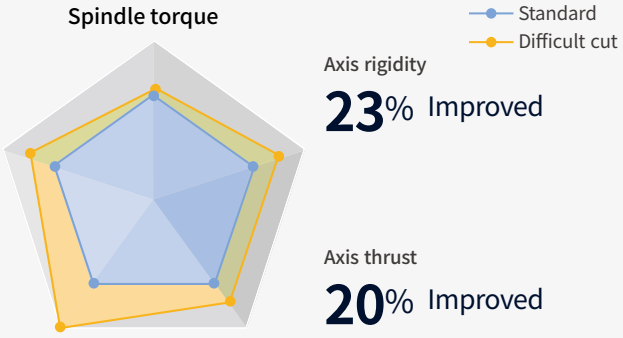
⚠ **Fire Safety Precautions** | There is a high risk of fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting the controlled and careful use of coolants and modifying the machine without the consent of the manufacturer. Always check the SAFETY GUIDELINES carefully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

PERIPHERAL EQUIPMENT

Hard-to-cut Material Cutting Package

We offer a high-torque gearbox spindle and a highly rigid machine structure to optimize the machining of difficult materials such as Titanium and Inconel (used in the Aerospace and Oil/Gas sectors), as well as traditional Die & Mold materials.

Spindle torque

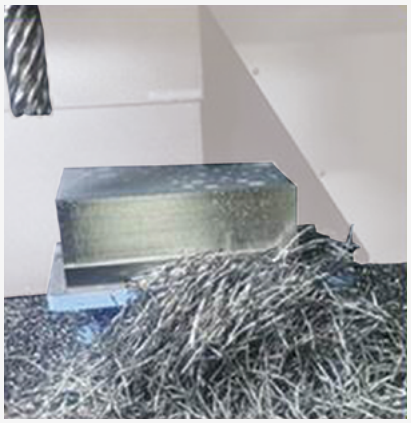


Coolant(Amount, pressure)
25% Improved

Axis rigidity
23% Improved

Cutting(depth)
50% Improved

Axis thrust
20% Improved



Material : Titanium

* *The results are provided as examples only and may not be obtained due to differences in prevailing cutting and environmental conditions.*

Peripheral equipment

Tool measuring device OPTION

TS27R

NC4

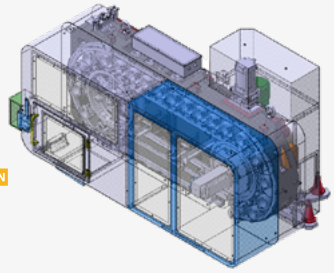
Chip bucket OPTION

Capacity **300** L (79.3 gal)

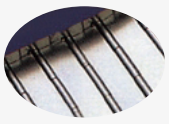
Linear scale OPTION

Servo magazine

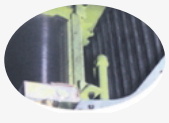
Tool
30ea OPTION



Chip conveyor OPTION



Hinged belt

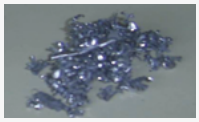


Magnetic scraper

Long

Needle

Short



Sludge

Material / Chip conveyor type	Carbon steel			Cast iron		Aluminium		
	Long	Short	Needle	Short	Sludge	Long	Short	Needle
Hinged belt type	○	△	X	△	X	○	△	X
Scraper type	X	○	△	○	△	X	○	△

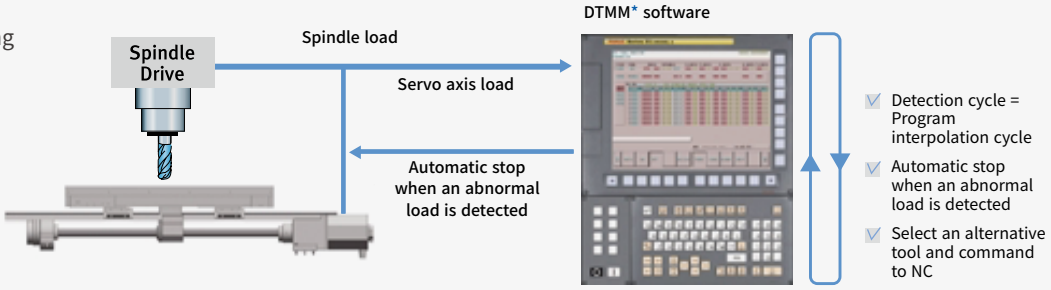
○ *Suitable* △ *Possible* X *Not suitable*

OPTIMIZED TOOL PROCESSING SOLUTION

Superior surface finishes and superior machining precision are achieved by using standard DN Solutions processing solutions, such as high speed / high precision contour control and thermal displacement compensation functions.

Tool load monitoring system (DTMM*)

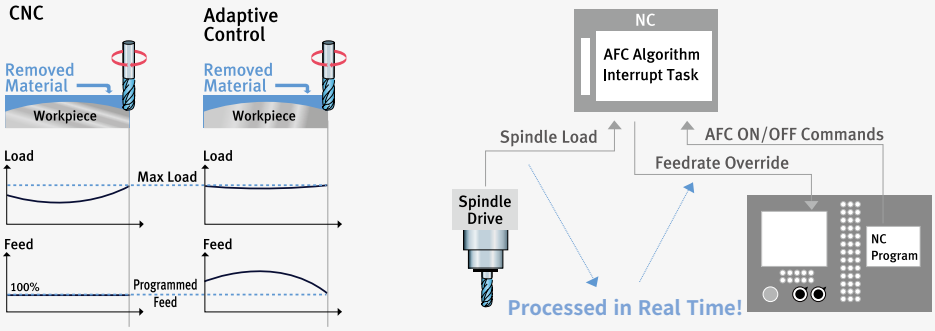
The technology that protects the tool and machine when machining abnormal loads.



*DTMM : DN Solutions Tool load Monitoring for Machining Centers

The optimal feed control (DAFC*)

Optimal feed control is ensured by spindle load detection that occurs in real time.



*DAFC : DN Solutions Adaptive Feedrate Control

Smart, multi-compensation thermal displacement technology

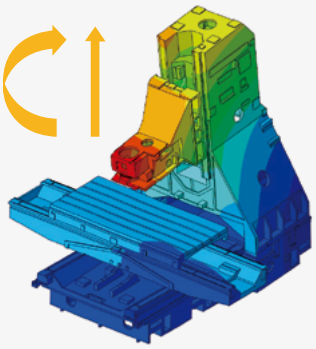
Realization of high-quality, high-precision machining achieved by thermal compensation of the spindle and machine structure.

Compensation of static spindle displacement

Compensates for changes in tool position caused by expansion of the spindle shaft during high speed operations.

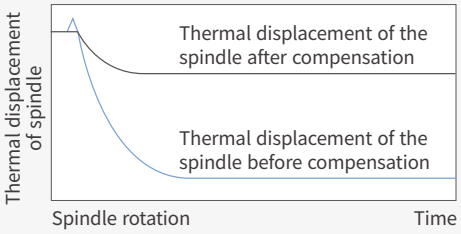
Structural thermal displacement compensation

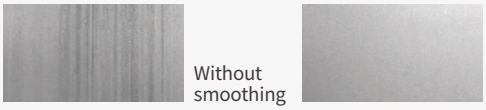
Compensates for any irregular deflection or expansion of the structure due to ambient temperature fluctuation by using multiple temperature sensors.



Thermal displacement compensation structure

Thermal displacement of the spindle, caused by heat accumulation, is compensated for using 5 algorithms including a smoothing function.





*DSTC : DN Solutions Smart Thermal Control

FANUC 31iB5 PLUS

Fanuc 31i Plus maximizes customer productivity and convenience.

15” Touch screen + New OP

DN Solutions Fanuc 31iB/B5 Plus’ operation panel enhances operating convenience by incorporating common-design buttons and layout. It features a Qwerty keyboard for fast and easy data input and operation.

FANUC 31iB5 PLUS

- 15-inch color display
- Intuitive and user-friendly design

USB and PCMCIA card QWERTY keyboard

- EZ-Guide i standard
- Ergonimic operator panel
- 4MB Memory
- Hot keys
- Enhance AICC BLOCK
- Touch pen provided as standard

iHMI touchscreen

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

Range of applications

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

NUMERIC CONTROL SPECIFICATIONS

FANUC

Item		Specifications	F31iB Plus MD 6700
Controlled axis	Controlled axes		5 (X,Y,Z)
	Simultaneously controlled axes		5 axes
	Additional controlled Axis	Add 1 Axis (5th Axis)	○
Data input/output	Fast data server		○
	Memory card input/output		●
	USB memory input/output		●
	Large capacity memory(2GB)*2)	Available Option only with 15” Touch LCD (iHMI Only)*2)	○
Interface function	Embedded Ethernet		●
	Fast Ethernet		○
	Enhanced Embedded Ethernet function		●
Operation	DNC operation	Included in RS232C interface.	●
	DNC operation with memory card		●
Program input	Workpiece coordinate system	G52 - G59	●
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●
	Tool number command		T4 digits
	Tilted working plane indexing command	G68.2 TWP	○
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	X
	AI contour control II	G5.1 Q_, 1000 Blocks*1)	●
	High smooth TCP		X
Operation guidance function	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Only with 15” Touch LCD standard*2)	X
	EZ Operation package		●
Setting and display	CNC screen dual display function		●
Network	FANUC MTConnect		✪
	FANUC OPC UA		✪
Others	Display unit	10.4" color LCD	X
		15" color LCD	X
		15" color LCD with Touch Panel	●
	Part program storage size & Number of registerable programs	640M(256KB)_500 programs	X
		1280M(512KB)_1000 programs	○
		2560M(1MB)_1000 programs	○
		5120M(2MB)_1000 programs	○
		10240M(4MB)_1000 programs	●
		20480M(8MB)_1000 programs	○
		2560M(1MB)_2000 programs	○
		5120M(2MB)_4000 programs	○
		10240M(4MB)_4000 programs	○
		20480M(8MB)_4000 programs	○

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

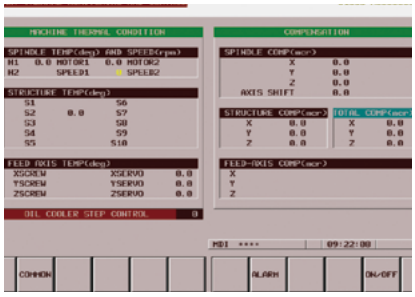
● Standard ○ Optional X Not applicable ✪ Available
Network: FANUC MTConnect and FANUC OPC UA available.

EZ WORK

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

EZ work

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

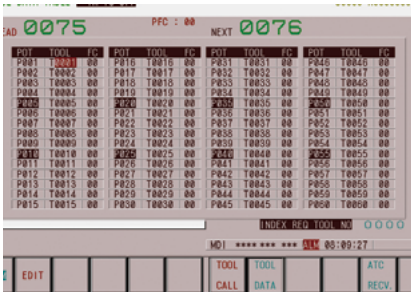


Thermal Compensation

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

M/G-Code List

Functional description of M code and G code



Tool Management

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

Operation Rate

Machine operation history management function by date based on load

Adaptive Feed Control

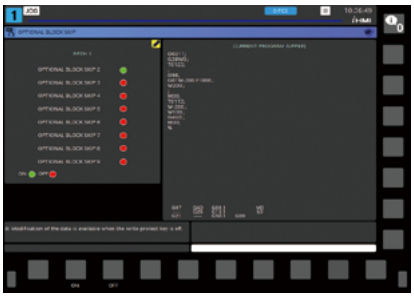
Function to control feedrate so that the cutting can be carried out at a constant load (To adapt to the spindle load set up with constant load feedrate control function)

Spindle Warm Up

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

ATC Recovery

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



Addition of Optional Block Skip

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

CONVENIENT OPERATION

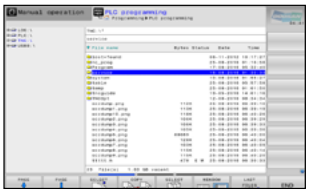
HEIDENHAIN TNC620

Superior hardware specifications

The TNC 620 features optimized motion control, short block processing times and special control strategies. Together with its uniform digital design and its integrated digital drive control (including inverters), it enables you to achieve high machining speeds and the best possible contour accuracy.

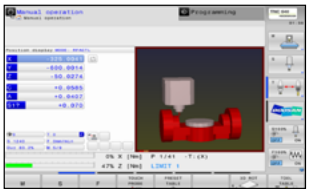
- 15.6” display
- 21GB Storage memory
- 1024 look ahead blocks
- High user convenience with folder structure data management

Conversational convenient function



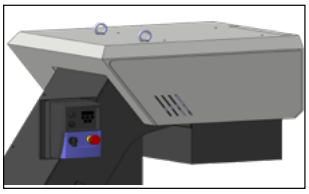
Data are controlled in the folder structure; convenient communication via USB devices

KinematicOpt & KinematicComp OPTION
(Touch probe cycle for automatic measurement)

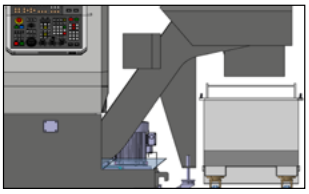


Collision protection system OPTION

Collision protection system OPTION



Various built-in pattern cycles for a wider scope of application (Software standard)



Graphic simulation

NUMERIC CONTROL SPECIFICATIONS

HEIDENHAIN

Item		Specifications	TNC620
			MD 6700
Controlled axis	Controlled axis		5 (X,Y,Z)
	Simultaneously controlled axis		5 axes
Data input/output	USB memory input/output		●
Interface function	Embedded ethernet		●
Feed function	Look-ahead	5000 blocks	●
Axis compensation	KinematicsOpt	Automatic measurement and optimization of machine kinematics	○
Collision monitoring	Dynamic collision monitoring (DCM)		X
Network	MTConnect		✪
Others	Display unit	15" color LCD with touch panel	●
	Part program storage size & number of registerable programs	4GB	●

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

CONVENIENT OPERATION

HEIDENHAIN TNC7

<TNC7>

Visualized, intuitive task support, customized UI

The TNC7 makes machining even easier, for everything from programming to program validation and from machine setup to actual machining. You intuitively operate highly complex applications directly on the touchscreen with various integrated solutions for standard tasks.

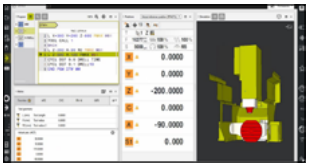
TNC7 NEW

- 24 inch touch screen
- 189GB Program memory
- Look-ahead 5000 blocks
- Touch Probe Cycles Graphical Programming

Conversational convenient function

Data are controlled in the folder structure; convenient communication via USB devices

KinematicOpt & KinematicComp OPTION (Touch probe cycle for automatic measurement)



Collision protection system OPTION

Various built-in pattern cycles for a wider scope of application (Software standard)

Graphic simulation

Enhanced collision protection function DCMv2 OPTION

Improved maintenance environment

Highly practical programming and setup based on touch operation

NUMERIC CONTROL SPECIFICATIONS

HEIDENHAIN

Item		Specifications	TNC7
Controlled axis	Controlled axis		5 (X,Y,Z)
	Simultaneously controlled axis		5 axes
Interface function	Embedded ethernet		●
	USB interface (USB 2.0)		●
Feed function	Look-ahead	5000 blocks	●
Axis compensation	KinematicsOpt	Automatic measurement and optimization of machine kinematics	●
Collision monitoring	Dynamic collision monitoring (DCM)		○
Network	MT Connect		✪
Others	Display unit	touch panel	24"
	Program memory for NC programs		189GB

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

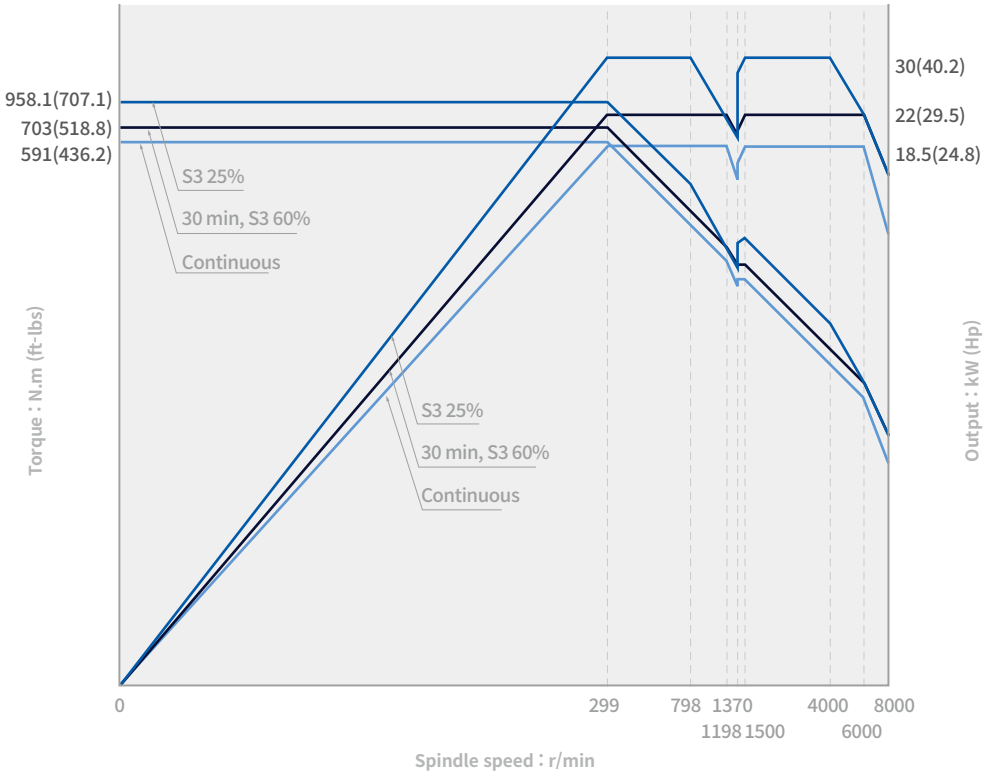
POWER | TORQUE

8000 r/min

Max. Spindle speed:
8000 r/min

Max. Spindle torque:
30 kW (40.2 Hp)

Max. Spindle power:
958.1 N·m (707.1 ft-lbs)

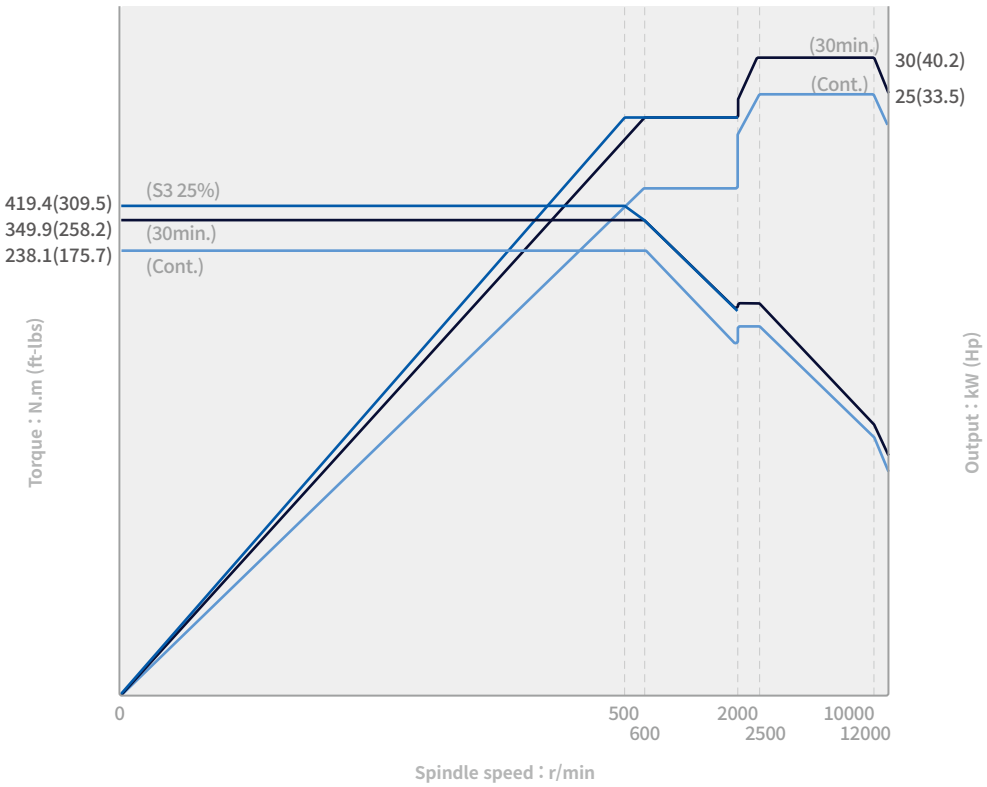


12000 r/min

Max. Spindle speed:
12000 r/min

Max. Spindle torque:
30 kW (40.2 Hp)

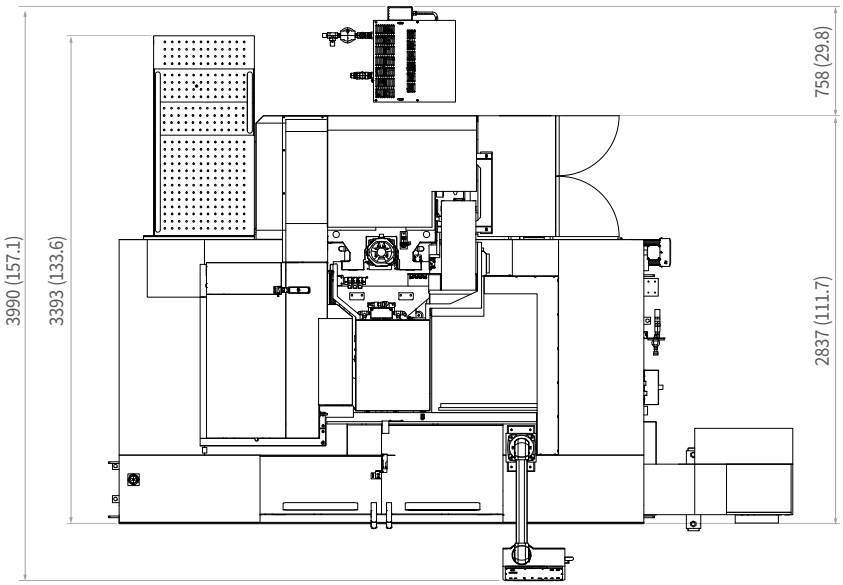
Max. Spindle power:
419.4 N·m (309.5 ft-lbs)



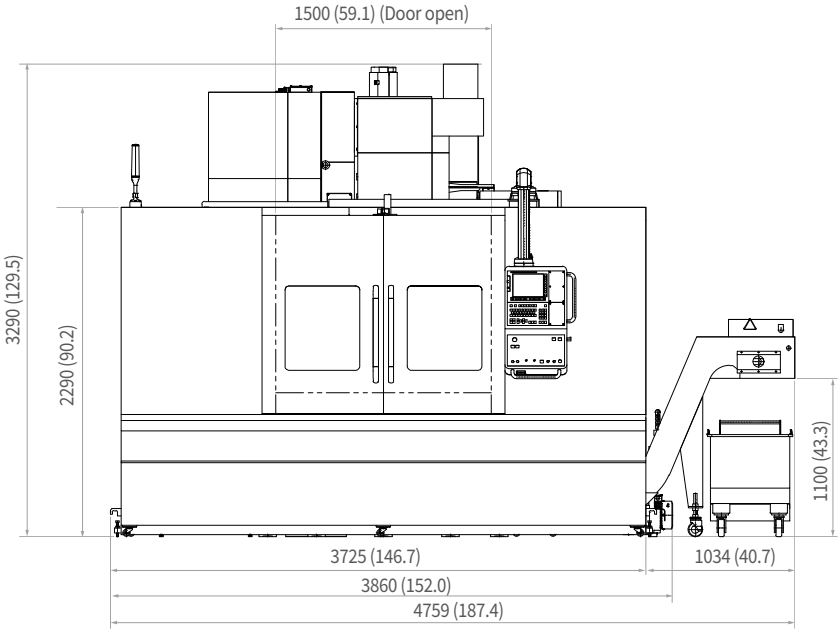
DIMENSIONS

Units : mm (inch)

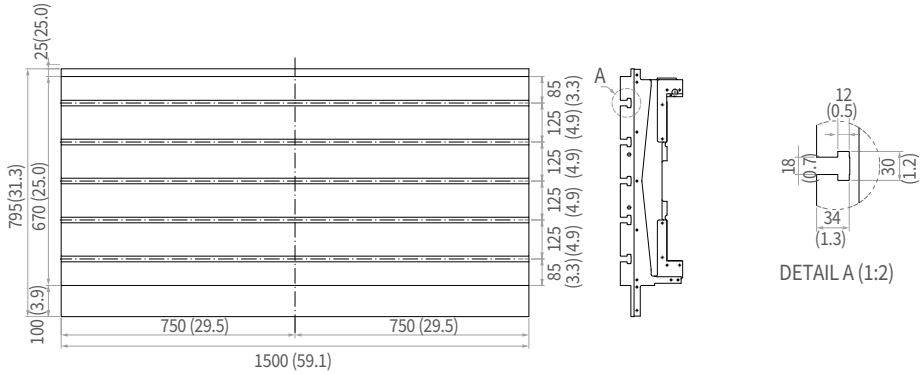
TOP



FRONT



TABLE



 ** Some peripheral equipment can be placed in other areas.*

MACHINE SPECIFICATIONS

Description			Unit	MD 6700
Travel	Travel distance	X-axis	mm (inch)	1300 (51.2)
		Y-axis	mm (inch)	670 (26.4)
		Z-axis	mm (inch)	670 (26.4)
	Distance from spindle nose to table top		mm (inch)	200 ~ 870 (7.9 ~ 34.3)
Table	Table size		mm (inch)	1500 x 670 (59.1 x 26.4)
	Tool storage capacity		kg (lb)	2000 (4409.2)
Spindle	Max. spindle speed		r/min	12000 {8000}*
	Taper		-	ISO #50
	Max. Spindle power		kW (Hp)	30 {30}* (40.2 {40.2})
	Max. spindle torque		N·m (ft-lbs)	419.4 {958.1}* (309.8 {707.1})
Feedrate	Rapid traverse rate	X-axis	m/min (ipm)	24 (944.9)
		Y-axis	m/min (ipm)	24 (944.9)
		Z-axis	m/min (ipm)	24 (944.9)
Automatic Tool Changer (ATC)	Tool storage capa.		ea	24 {30}*
	Max. tool diameter	Continous	mm (inch)	125 (4.9)
		Without Adjacent Tools	mm (inch)	230 (9.1)
	Max. tool length		mm (inch)	400 (15.7)
	Max. tool weight		kg (lb)	20 (44.1)
	Tool change time (Tool-to-tool)		sec	2.7
Machine Dimensions	Height		mm (inch)	3310 (130.3)
	Length		mm (inch)	3990 (157.1)
	Width		mm (inch)	3860 (152.0)
	Weight		kg (lb)	12000 (26455.1)
Control	CNC system		-	F31iB Plus

*{ } : Option

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

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