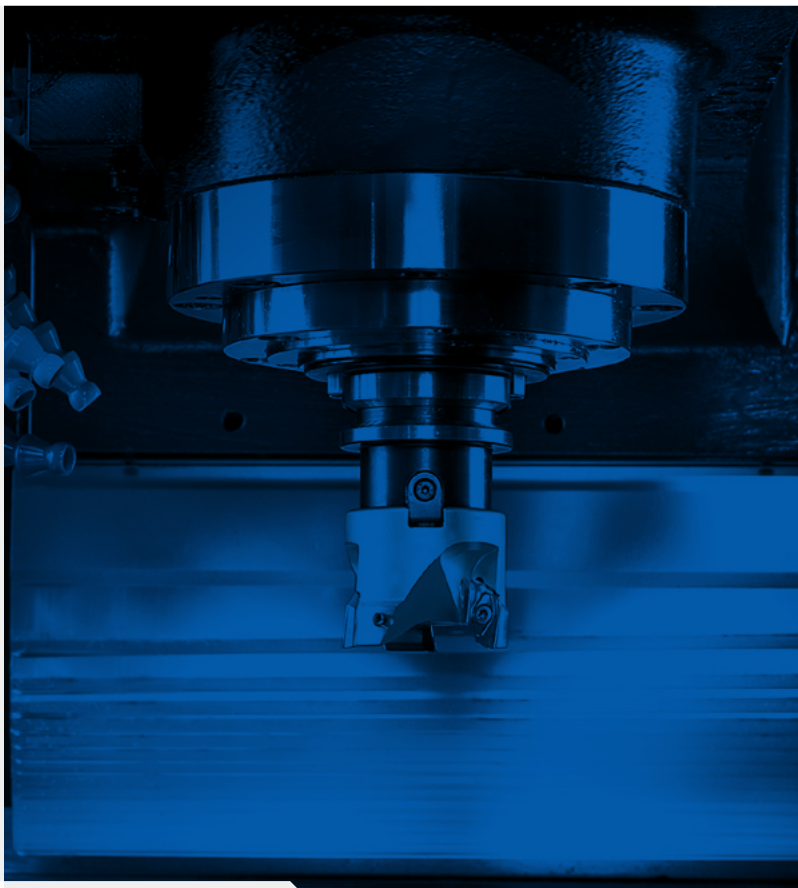
DN SOLUTIONS

HIGH PRODUCTIVITY VERTICAL MACHINING CENTER
EQUIPPED WITH DUAL PALLET

VC 3600





VC 3600

The VC 3600 is a compact high-productivity Vertical machining center designed for the automotive and IT industries. It is equipped with a simultaneous operation function where rotary table turns and the all axes are positioned simultaneously when tools are changed. Durability and reliability have been further improved by adopting a more rigid frame and a servo unit.

CONTENTS

Product Overview

Basic Information

04 Basic Structure
05 Spindle Information
06 ATC I Cutting Performance
07 Standard I Optional Specifications
08 Peripheral Equipment

Detailed Information

09 FANUC 31i PLUS
10 Power I Torque I Table Dimensions
11 Dimensions
12 Machine Specifications

Customer Support Service

13 Why DN Solutions
14 Customer Support and Services
15 Global Network



SERVO-TYPE APC (AUTO PALLET CHANGER) AND ATC (AUTO TOOL CHANGER) AS STANDARD FEATURES TO ACHIEVE EVEN HIGHER PRODUCTIVITY AND RELIABILITY

- Servo-driven APC reduces pallet change time by about 30%. Servo-driven ATC incorporating 20 tools as standard feature reduces tool change time by up to 23%.

NEWLY-DESIGNED DIRECT COUPLED SPINDLE WITH IMPROVED PRODUCTIVITY AND HEAVY DUTY CUTTING PERFORMANCE

- The spindle design has been optimized by reducing acceleration and deceleration times even higher productivity. Adoption of dual contact spindle as standard feature improves heavy duty machining performance.

VARIOUS USER CONVENIENCE FEATURES

- Auxiliary chip box (optional) effectively filters fine aluminum chips.



BASIC STRUCTURE

The VC 3600, a Tool Taper ISO #40 Class Dual Pallet Vertical machining center , is equipped with a highly reliable servo unit and a new frame, and offers superior productivity and reliability.

High-Rigidity Structure

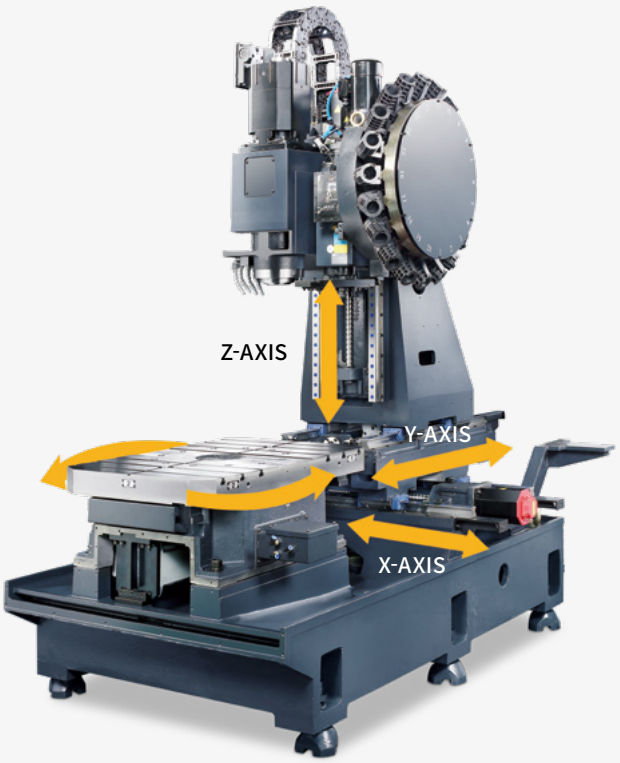
The machine's structure has been improved and optimized by CAE analysis to enhance rigidity and thereby ensure stable and accurate machining over long periods.

Travel distance (X / Y / Z)

X-axis
520 mm
(20.5 inch)

Y-axis
360 mm
(14.2 inch)

Z-axis
465 mm
(18.3 inch)



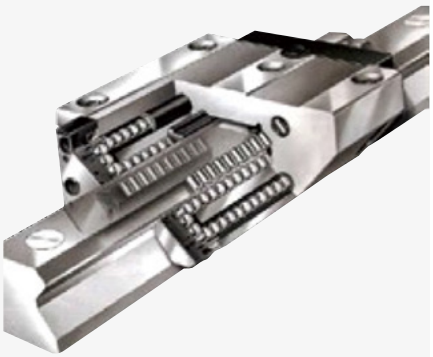
Axis system

Environmentally friendly oil lubrication is adopted as standard for all of the axis feed system, and roller-type LM guides are provided to enhance the rigidity.

Rapid traverse rate (X / Y / Z)

48 / **48** / **48** m/min
(1890 / 1890 / 1890 ipm)

Roller-type LM guides are provided as a standard feature



Oil lubrication system

The standard oil lubrication system eliminates the need for an oil skimmer and reduces lubrication costs by about 60% compared to oil lubrication.

Yearly maintenance cost

Max **60** %



Oil lubrication for all axes is a standard feature

SPINDLE INFORMATION

To enhance precision and powerful machining capability, direct coupled and dual contact spindle are provided as standard features. Also, spindle maximum power and torque characteristic is upgraded compare to previous model.

Max. spindle speed

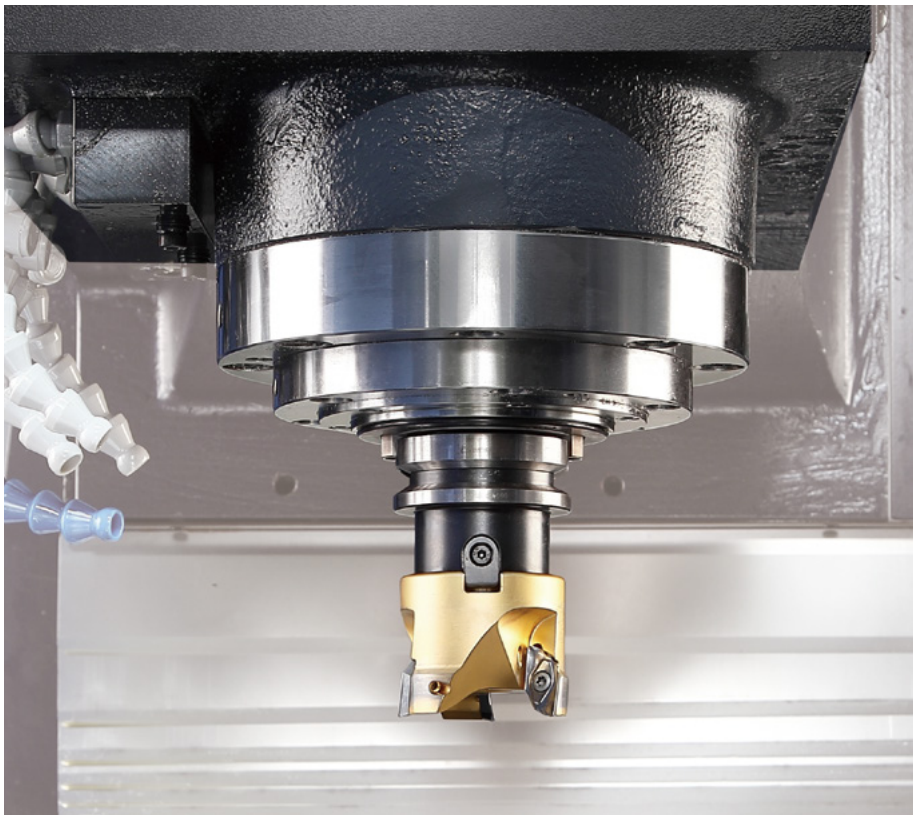
12000 r/min

Max. spindle motor power

18.5 kW
(24.8 Hp)

Max. spindle motor torque

95 N.m
(70.1 lbf.ft)



AUTO PALLET CHANGE SYSTEM (APC)

The servo driven system has been adopted tofurther reduce non cutting time (pallet change time), thereby enhancing productivity and reliability.

Table size

2-650 x 375 mm
(2-25.6x14.8 inch)

Pallet change time

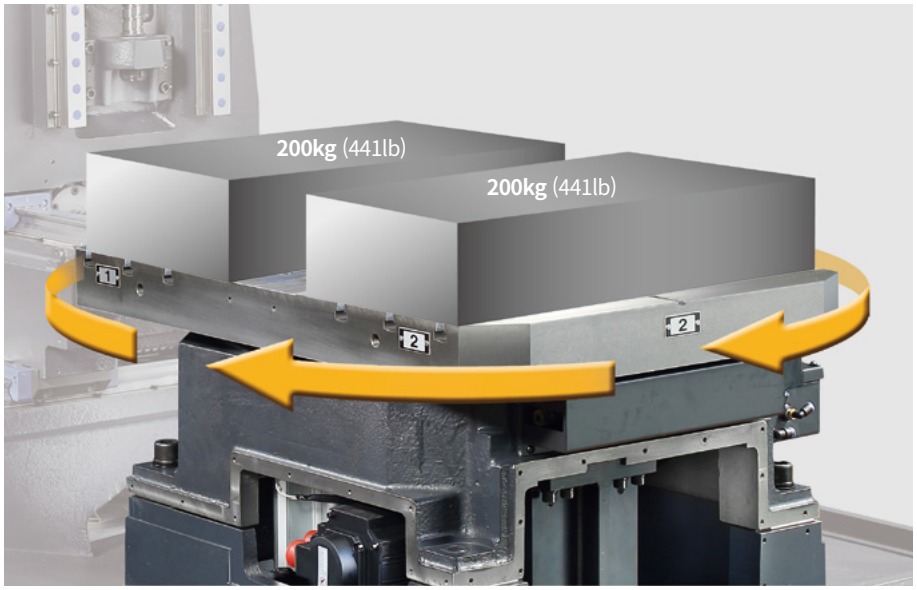
2.9 sec (120 kg on 1 pallet)

Max. workpiece weight

2-200 kg (2-441 lb)

Max. workpiece height

300 mm (11.8 inch)



ATC I CUTTING PERFORMANCE

ATC (Automatic Tool Changer)

The servo-type ATC improves reliability and reduces idle time.

Tool storage capacity

20 ea

Tool to Tool Time

1.6 sec

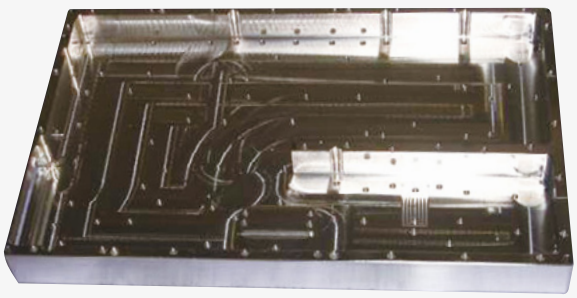
Previous models	1.7 sec.
VC 3600	**1.6 sec.**



Productivity

Sample Work Piece

Material: Alumininum (AL6061)



Previous models	479 sec.
VC 3600	**402 sec.**

16 % Reduced by

STANDARD I OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

Description	Features		VC 3600
Spindle	12000 r/min	18.5/5.5 kW (24.8/7.4 Hp) (S3 15%/Cont.)	●
Spindle cooling system	12000 r/min	18.5/5.5 kW (24.8/7.4 Hp) (S3 15%/Cont.)	●
Magazine	Tool storage capacity	20 ea	●
Tool shank type	BIG PLUS BT40		●
	BIG PLUS CAT40		○
	BIG PLUS DIN40		○
Coolant	FLOOD	0.16Mpa , 0.4kW	●
	TSC	2 MPa, 1.5kW	○
	TOP FLUSHING	0.15Mpa, 1.1kW	●
	Oil Skimmer	Belt type	○
	MQL		○
Precision machining option	AICC II (200 Block)		●
Measurement & Automation	Automatic tool measurement	TS27R	○
	Automatic tool breakage detection		○
	Automatic workpiece measurement	OMP40	○
	Automatic front door with safety edge		○
ACCESSORIES Option	Chip pan		●
	Chip conveyor	Hinged type(Rear)	○
		Magnetic scraper type(Rear)	○
	Chip bucket		○
	Air blower		○
	Air gun		○
	Coolant gun		○
	Mist collector		●
	OPERATOR CALL LAMP	3-COLOR SIGNAL TOWER (LED)	●
	LEVELING BLOCK & BOLT		●
	ASSEMBLY & OPERATION TOOLS KIT		●
	TOP COVER		●
	4TH AXIS PREPARATION CABLING FOR SERVO/1-PNEUMATIC PIPING	FACTORY READY MADE	○
	4TH AXIS WITH CNC R.TABLE [1]	AVAILABLE SIZE Ø170mm	○
		SERVO MOTOR DEPENDS ON THE TABLE	○
	ANCHORING[2]	J-BOLT	○
		SIDE CLAMP & Chemical Anchor Bolt	○
	AUTO DOOR		○
	AIR GUN		○
	Water soluble Coolant Chiller**		○
Customized Special Option	DRUM CHIPCONVEYOR	HINGE TYPE	○
		SCRAPER TYPE	○

** Please contact DN Solutions to select detailed steady rest specifications.*

● *Standard* ○ *Optional* X *N/A*

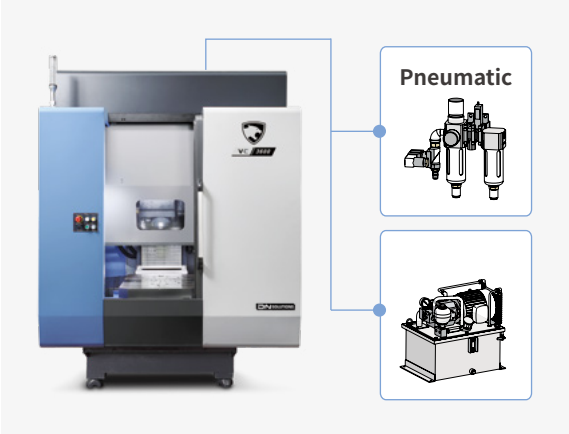
1) PLEASE INQUIRE DN Solutions R&D DEPARTMENT WHEN END-USER SELECT.
2) PLEASE REFER TO FOUNDATION DRAWING IN RELATION TO ANCHORING. IF MORE DETAIL INFORMATION WANT,
** When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.*
*** Technical consultation is mandatory for the chilling of non-water soluble coolant*

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

Hydraulic/Pneumatic Fixture Line OPTION

Users who intend preparing equipment for hydraulic / pneumatic fixtures should consult DN Solutions to determine correct specification.



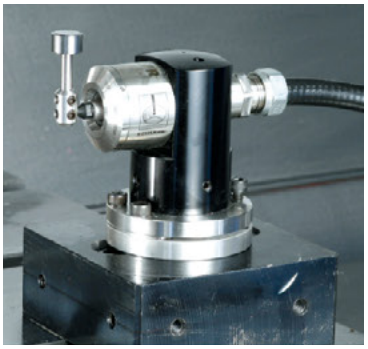
TSC OPTION

The through-spindle coolant (TSC)system delivers higher machining efficiency (optional).



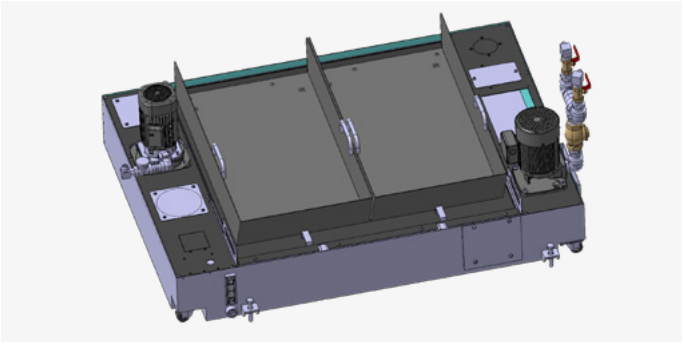
Automatic Tool Length Measurement Device OPTION

The Automatic Tool Length Measurement Device monitors excessive tool wear or breakage, and can be used for automatic tool setting.



An auxiliary chip box

An auxiliary chip box for effective filtering of fine aluminum chips is available as an optional feature



Top Cover

The top cover (standard feature) prevents coolant splash, thereby maintaining a clean working environment.



Chip Conveyor OPTION



Conveyor Type \ Work & Chip Size		Carbon steel			Cast iron		Aluminium		
		Long	Short	Needle	Short	Sludge	Long	Short	Needle
Hinged Belt Type		○	△	X	△	X	○	△	X
Scraper Type	General Type	X	○	△	○	△	X	△	X
	Magnetic Type	X	○	○	○	○	-	-	-
Drum Filter Type	Hinged Type	○	△	X	△	X	○	△	X
	Scraper Type	X	○	△	○	△	X	○	△

○ : Suitable, △ : Possible, X : Not suitable

Variable Control of Work Piece Load

Issuing an M-code corresponding to the work weight can change pallets at a speed appropriate for the weight.



M 384:
0~120 kg (biased load)

M 380:
120~200 kg (biased load)

FANUC i PLUS

DN Solutions Fanuc i Plus is optimized for maximizing customer productivity and convenience.

15 inch screen + new operation panel

DN Solutions Fanuc i Plus' operation panel enhances operating convenience by incorporating common-design buttons and layout, and features the Qwerty keyboard for fast and easy operation.

FANUC i PLUS

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

USB & PCMCIA card QWERTY keyboard

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



Hoy Key

Frequently used functions can be accessed quickly and easily by clicking the hot key buttons.



1. Tapping Retract function: A function for releasing a tool by reverse rotating the spindle in the Manual mode when the tool is caught due to power shutdown, emergency stop or NC resetting during the machining process.
2. Return to home position with single-touch operation: Pressing the button in the Manual mode returns the z axis to the primary home position.
3. Return to ATC position: Pressing the button in the Manual mode returns the z axis to the secondary home position, where the tool magazine can rotate.
4. Next Tool Change function: Pressing the button to exchange adjacent tools in the Manual mode calls [Present Tool Number + 1] of the adjacent tool for automatic exchange of the tool.



Pressing the button in the Manual mode moves the Y and Z axes to the primary home positions to enable APC function. While the One-touch APC CHANGE POSITION key is active, the "REF" selector button lamp flashes.

NUMERIC CONTROL SPECIFICATIONS

FANUC

Item		Specifications	FANUC i (FOi PLUS) VC 3600
Controlled axis	Controlled axes		3 (X,Y,Z)
	Simultaneously controlled axes		4 axes
	Additional controlled Axis	Add 1 Axis (5th Axis)	●
Data input/output	Fast data server		○
	Memory card input/output		●
	USB memory input/output		●
	Large capacity memory(2GB)*2	Available Option only with 15" Touch LCD (iHMI Only) *2)	○
Interface function	Embedded Ethernet		●
	Fast Ethernet		○
	Enhanced Embedded Ethernet function		●
Operation	DNC operation	Included in RS232C interface.	●
	DNC operation with memory card		●
Program input	Workpiece coordinate system	G52 - G59	●
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●
	Tool number command		T4 digits
	Tilted working plane indexing command	G68.2 TWP	○
Feed function	AI contour control I	G5.1 Q_, 40 Blocks	X
	AI contour control II	G5.1 Q_, 200 Blocks	●
	AI contour control II	G5.1 Q_, 600 Blocks	X
	AI contour control II	G5.1 Q_, 1000 Blocks *1)	X
	High smooth TCP		X
Operation guidance function	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Only with 15" Touch LCD standard *2)	X
	EZ Operation package		●
Setting and display	CNC screen dual display function		●
Network	FANUC MTConnect		✪
	FANUC OPC UA		✪
Others	Display unit	10.4" color LCD	X
		15" color LCD	X
		15" color LCD with Touch Panel	●
	Part program storage size & Number of registerable programs	640M(256KB)_500 programs	X
		1280M(512KB)_1000 programs	X
		2560M(1MB)_1000 programs	X
		5120M(2MB)_1000 programs	●
		10240M(4MB)_1000 programs	X
		20480M(8MB)_1000 programs	X
		2560M(1MB)_2000 programs	X
		5120M(2MB)_4000 programs	X
		10240M(4MB)_4000 programs	X
		20480M(8MB)_4000 programs	X

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

● Standard ○ Optional X N/A ✪ Available
Network: FANUC MTConnect and FANUC OPC UA available.

POWER I TORQUE I TABLE DIMENSIONS

Spindle

Max. Spindle speed

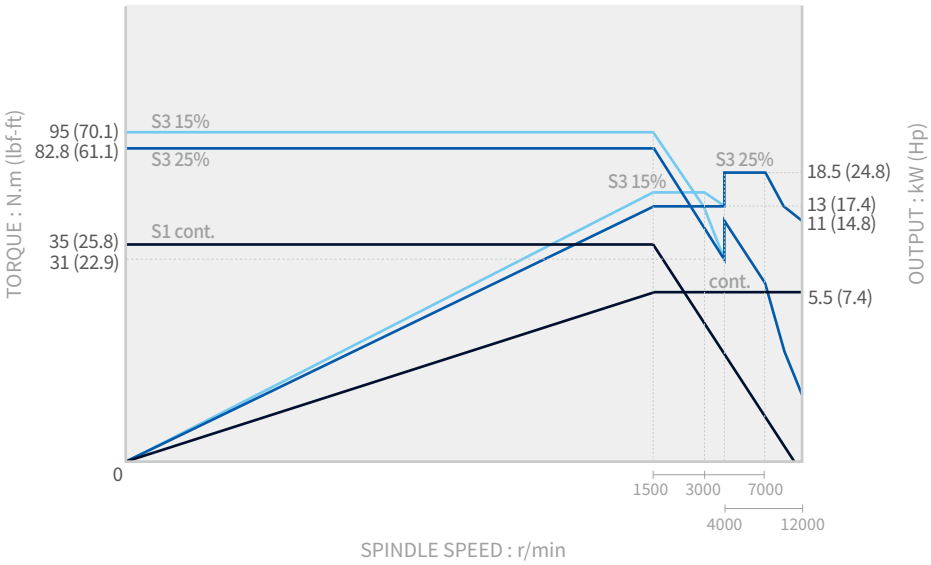
12000 r/min

Max. Spindle motor power

18.5 kW (24.8 Hp)

Max. spindle motor torque

95 N.m (70.1 lbf-ft)

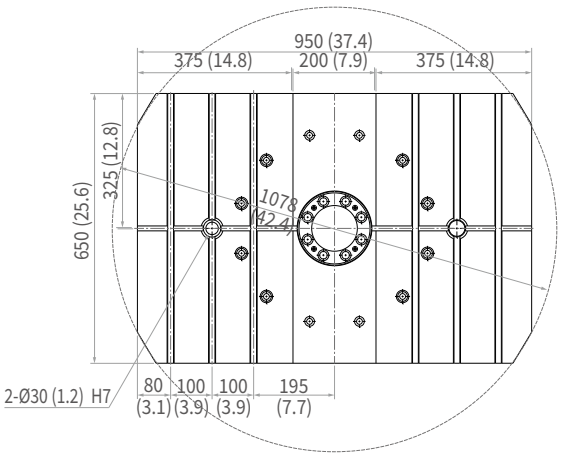


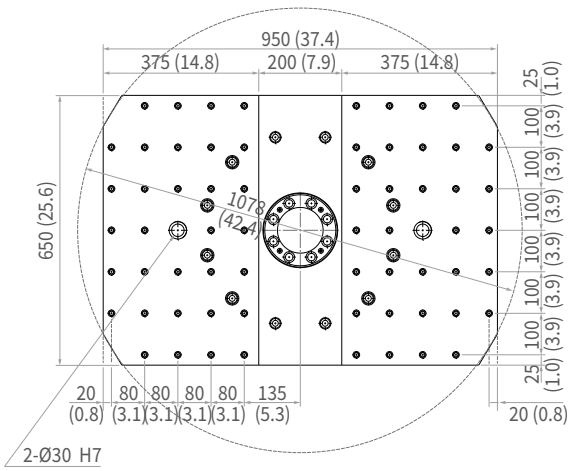
Table

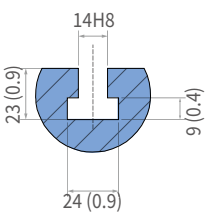
T-SLOT

TAP HOLE

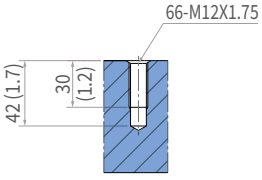
Units : mm (inch)







T-SLOT

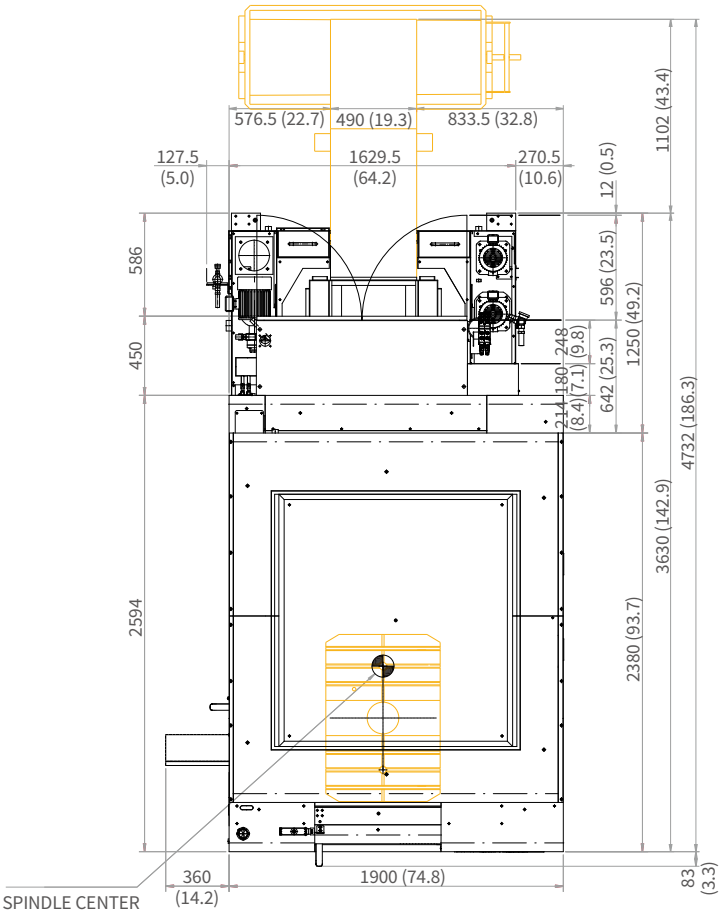


TAP SECTION

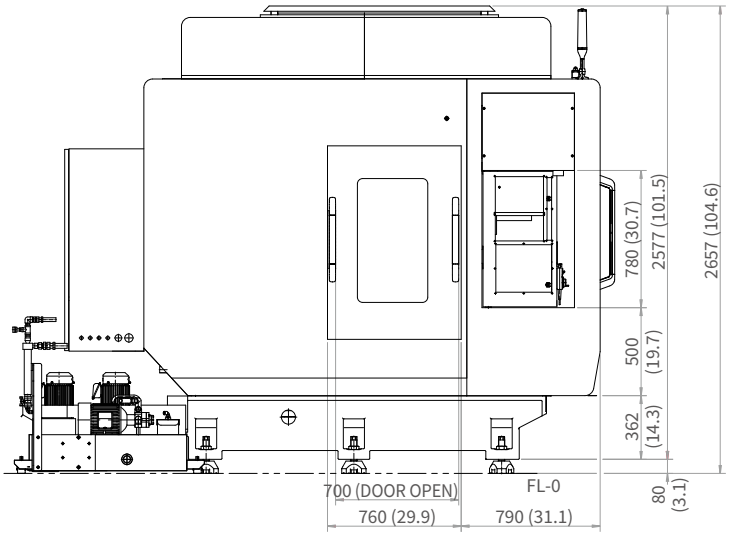
DIMENSIONS

Units : mm (inch)

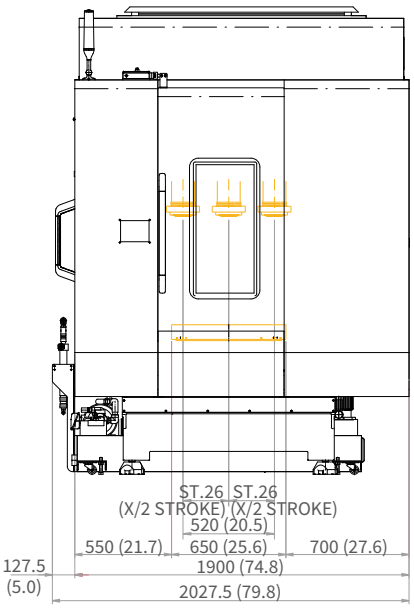
TOP



SIDE



FRONT



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

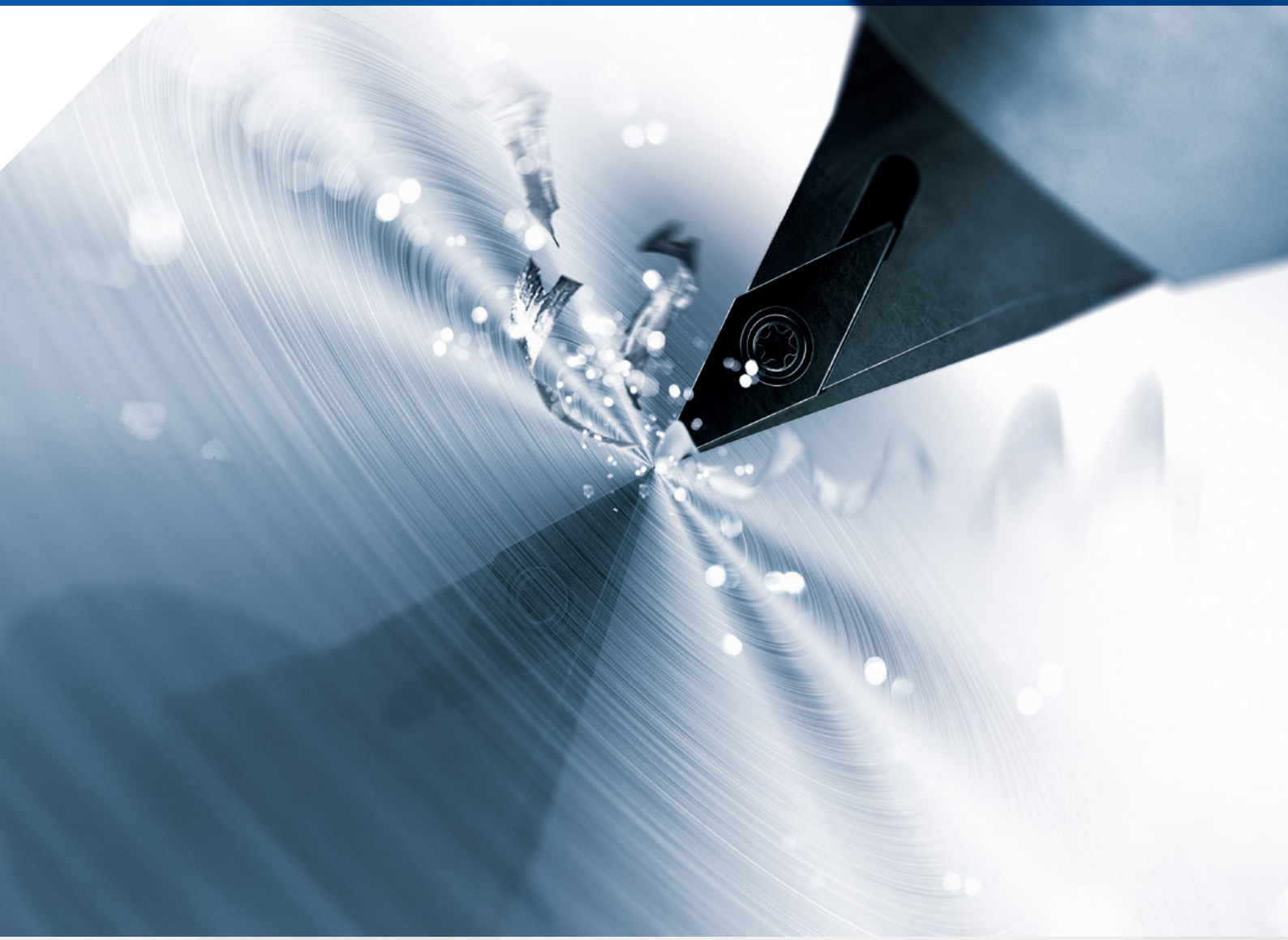
MACHINE SPECIFICATIONS

Description			Unit	VC 3600
Travels	Travel distance	X axis	mm (inch)	520 (20.5)
		Y axis	mm (inch)	360 (14.2)
		Z axis	mm (inch)	465 (18.3)
	Distance from spindle nose to table top		mm (inch)	150 ~ 615 (5.9 ~ 24.2)
Table	Table size		mm (inch)	2-650 x 375 (2-25.6 x 14.8)
	Table loading capacity		kg (lb)	2-200 (2 - 440.9)
	Table surface type		mm (inch)	TAP HOLE TYPE(2X32-M12XP1.75) {T-SLOT TYPE(2X3-100x14H8)}*
Spindle	Max. spindle speed		r/min	12000
	Tool taper		-	ISO #40
	Spindle power (S3 15%/Cont.)		kW (Hp)	18.5/5.5 (24.8 / 7.4)
	Max. spindle torque (S3 15%)		N·m (lbf-ft)	95 (70.1)
Feedrates	Rapid traverse rate	X axis	m/min (ipm)	48 (1889.8)
		Y axis	m/min (ipm)	48 (1889.8)
		Z axis	m/min (ipm)	48 (1889.8)
Automatic Tool Changer	Type of tool shank	Tool shank	-	BT 40 {CAT40/DIN40}*
		Pull stud	-	MAS403 P40T-1(15°)
	Tool storage capa.		ea	20
	Max. tool diameter	Continous	mm (inch)	90 (3.5)
		Without Adjacent Tools	mm (inch)	125 (4.9)
	Max. tool length		mm (inch)	200 (7.9)
	Max. tool weight		kg (lb)	5 (11.0)
	Max. tool moment		N·m (ft-lbs)	9.8 (7.2)
	Tool seletion		-	MEMORY RANDOM
	Tool change time	Tool-to-tool	sec	1.6
		Chip-to-chip	sec	3.4
Power source	Electric power supply (rated capacity)		kVA	21.3
	Compressed air supply		Mpa (psi)	0.54
Tank capacity	Coolant tank capacity		L (gal)	300 (79.3)
Machine Dimensions	Height		mm (inch)	2690 (105.9)
	Length		mm (inch)	3660 (144.1)
	Width		mm (inch)	2010 (79.1)
	Weight		kg (lb)	5400 (212.6)
Control	CNC system		-	DN Solutions Fanuc i Plus, HEIDENHAIN TNC 620 NC

*{ } : Option

WHY DN SOLUTIONS

The DN Solutions promise, MACHINE GREATNESS, has two important meanings. The first is simple: DN Solutions 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 DN Solutions over other options?*** Here's why…



UNBEATABLE MACHINES

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

READILY AVAILABLE - ANYWHERE IN THE WORLD

Machining centres (including 5-axis machines), lathes, multi-tasking turning centres and mill-turn machines, and horizontal borers with best-in-class specifications are all available…ready to install.

ROBUST PRODUCT LINE

We offer an impressive range of machine models and hundreds of configurations. Whatever your machining needs and requirements, there's a DN Solutions 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 DN Solutions 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**

DN SOLUTIONS GLOBAL NETWORK

DN Solutions 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.



66	COUNTRIES
140+	SALES NETWORKS
3	FACTORIES
6	REGIONAL HQS



DN SOLUTIONS

dn-solutions.com

Head Office

19F, 10, Tongil-ro, Jung-gu, Seoul,
Republic of Korea, 04527

Tel: +82-2-6972-0370
Fax: +82-2-6972-0400

DN Solutions America

360 E State PKWY,
Schaumburg, IL. 60173,
United states

Tel: +1-315-265-7500

DN Solutions Europe

Emdener Strasse 24, D-41540
Dormagen, Germany

Tel: +49-2133-5067-100
Fax: +49-2133-5067-111

DN Solutions (India) Private Limited.

Plot No. 137, Devanahalli General
Industrial Area (KIADB), ACIL,
Kundana and Kasaba Area,
Devanahalli, Bengaluru Rural – 562110.
Karnataka, INDIA.

Email: info.india@dncompany.com

DN Solutions 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

DN Solutions Vietnam

M.O.R.E building 2F, 40A-40B Ut
Tich Street, 04 Ward 04,
District Tan Binh District,
Ho Chi Minh City, Vietnam

Tel: +84 28-7304-0163

DN Solutions Mexico

Avenida Parque Bicentenario
#100 Nave M65L3-6,
Fraccionamiento San Isidro
Business Park,
Santa Rosa Jauregui,
Querétaro, México

E-mail: efrain.figueroa@
dncompany.com

Sales inquiry

sales@dncompany.com

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

ver. EN 260615 SU