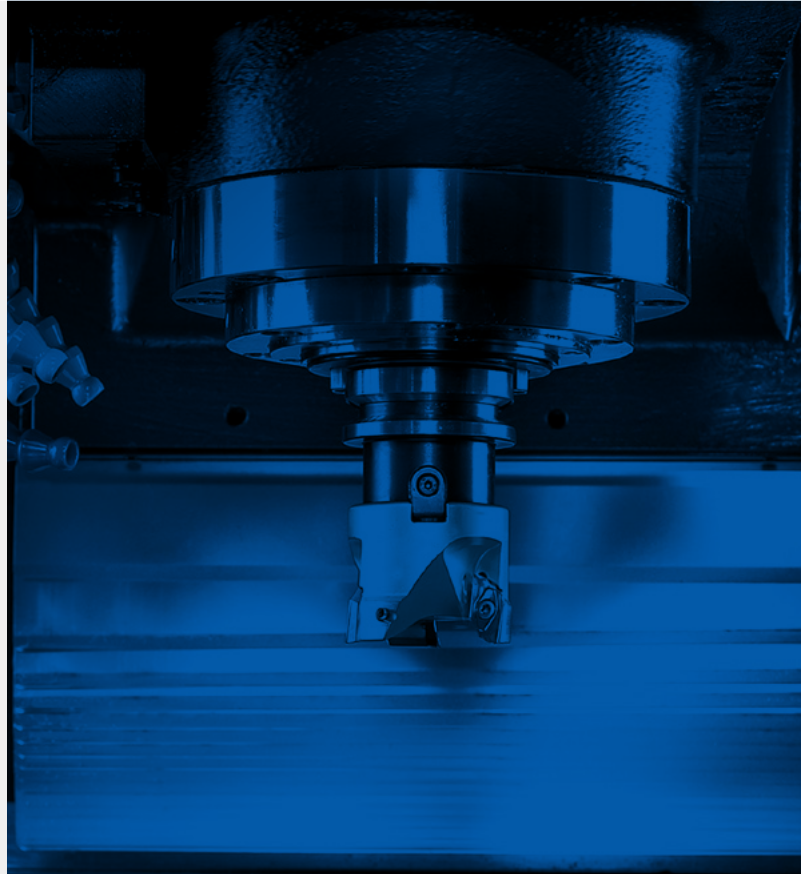


HIGH PRODUCTIVITY VERTICAL MACHINING CENTER
EQUIPPED WITH DUAL PALLET

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 | Cutting Performance
- 07 Standard | Optional Specifications
- 08 Peripheral Equipment

Detailed Information

- 09 FANUC 31i PLUS
- 10 Power | Torque | 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)



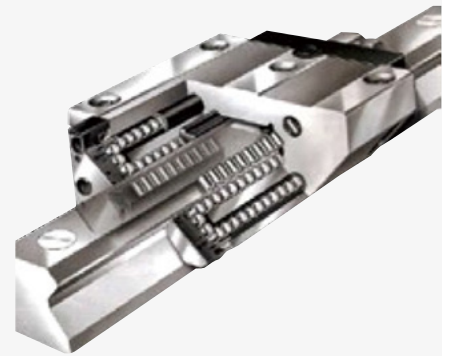
Axis system

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

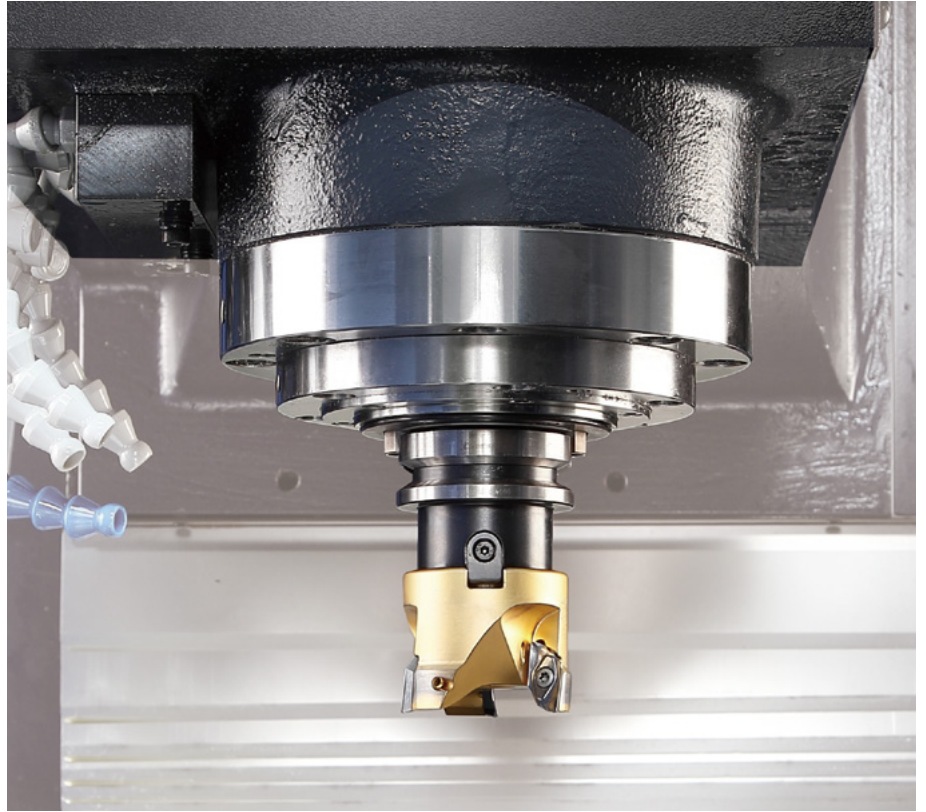
12000 r/min

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 to further 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

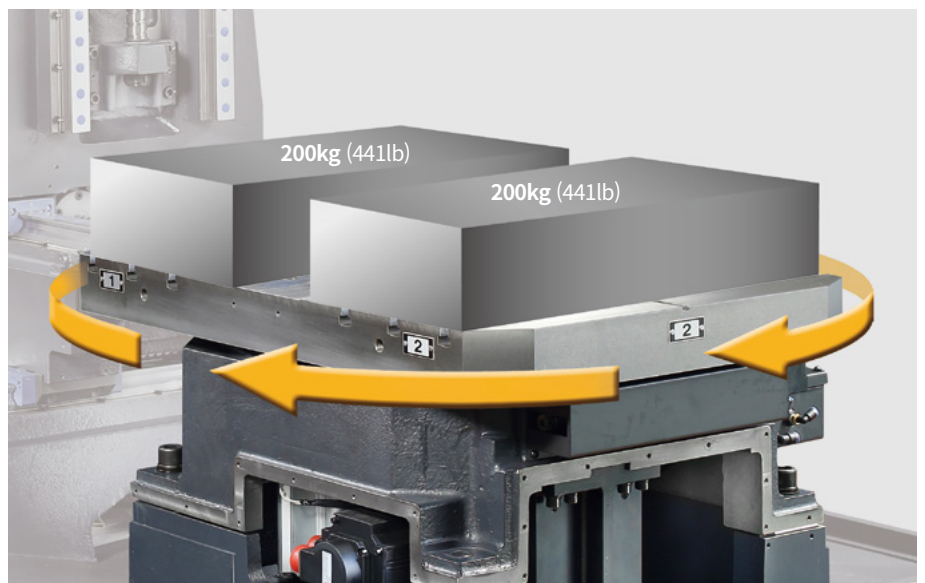
2.9 sec (120 kg on 1 pallet)

Max. workpiece weight

2-200 kg (2-441 lb)

Max. workpiece height

300 mm (11.8 inch)



ATC | 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

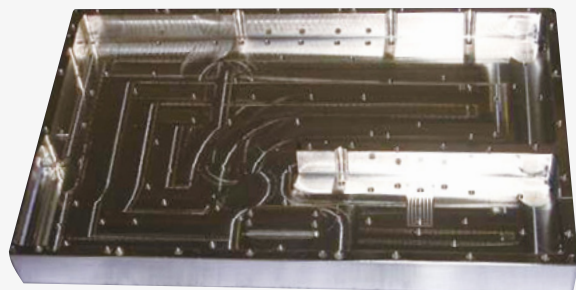
Previous models	1.7 sec.
VC 3600	1.6 sec.



Productivity

Sample Work Piece

Material: Aluminium (AL6061)



Previous models	479 sec.
-----------------	----------

VC 3600	402 sec.
----------------	-----------------

↙ **16** % Reduced by

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

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

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

● Standard ○ Optional X N/A



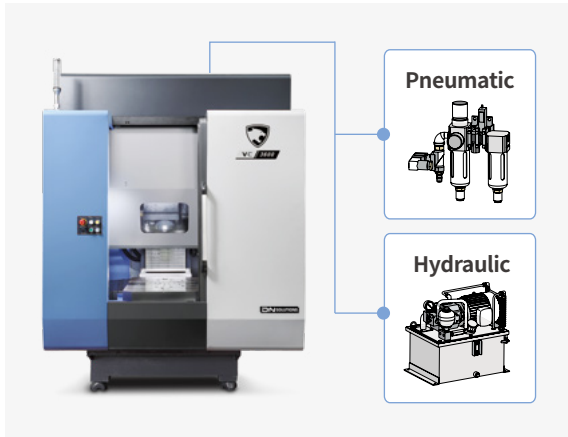
Fire Safety Precautions

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

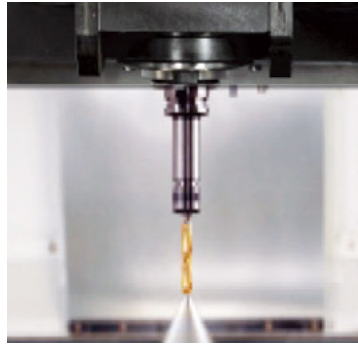
Hydraulic/Pneumatic Fixture Line OPTION

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).



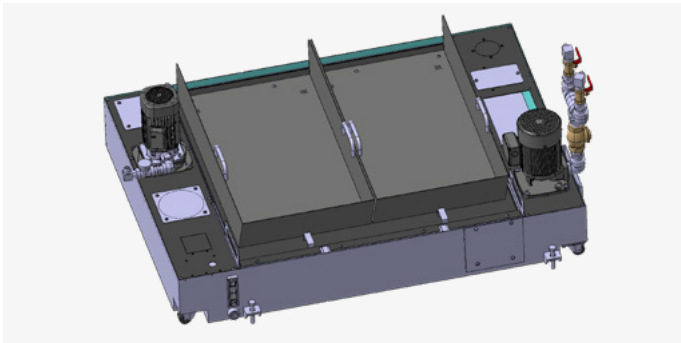
Automatic Tool Length Measurement Device OPTION

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



Long



Short



Needle



Sludge

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
- Ergonomic 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 3 (X,Y,Z) 4 axes	
Controlled axis	Controlled axes			
	Simultaneously controlled axes			
Data input/output	Additional controlled Axis	Add 1 Axis (5th Axis)	●	
	Fast data server		○	
Interface function	Memory card input/output		●	
	USB memory input/output		●	
	Large capacity memory(2GB)*2	Available Option only with 15" Touch LCD (iHMI Only) *2)	○	
Operation	Embedded Ethernet		●	
	Fast Ethernet		○	
	Enhanced Embedded Ethernet function		●	
Program input	DNC operation	Included in RS232C interface.	●	
	DNC operation with memory card		●	
Feed function	Workpiece coordinate system	G52 - G59	●	
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●	
	Tool number command		●	
	Tilted working plane indexing command	G68.2 TWP	○	
Operation guidance 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	
Setting and display	EZ Guidei (Conversational Programming Solution)		●	
	iHMI with Machining Cycle	Only with 15" Touch LCD standard *2)	X	
Network	EZ Operation package		●	
	CNC screen dual display function		●	
Others	FANUC MTConnect		⊕	
	FANUC OPC UA		⊕	
	Display unit	10.4" color LCD		X
		15" color LCD		X
	Part program storage size & Number of registerable programs	15" color LCD with Touch Panel		●
		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

POWER | TORQUE | TABLE DIMENSIONS

Spindle

Max. Spindle speed

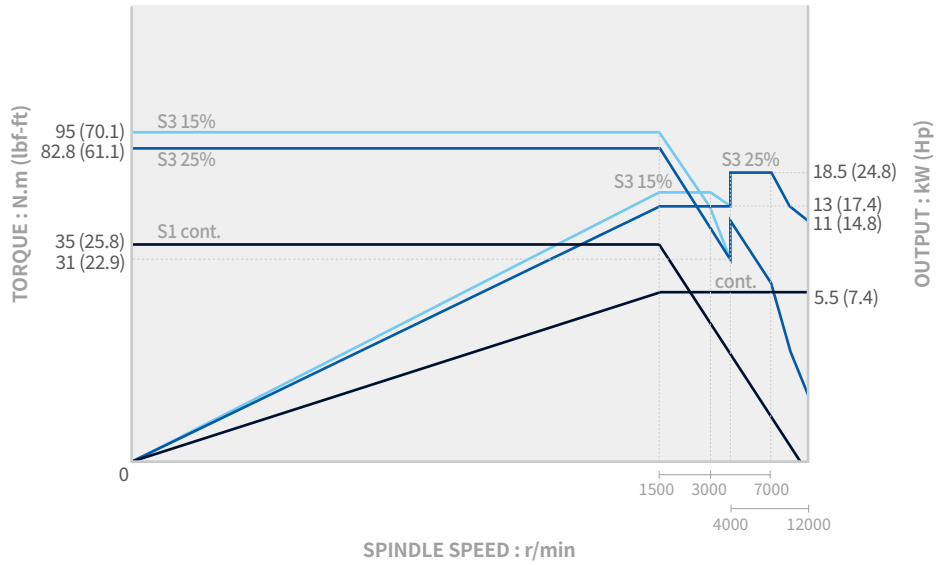
12000 r/min

Max. Spindle motor power

18.5 kW (24.8 Hp)

Max. spindle motor torque

95 N.m (70.1 lbf-ft)

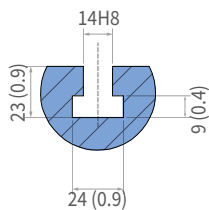
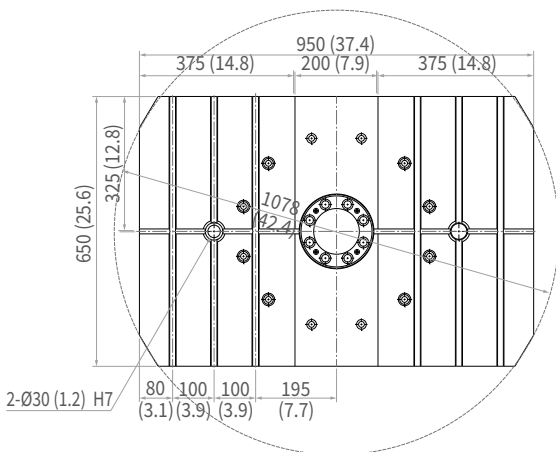


Table

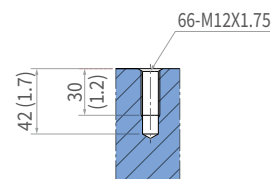
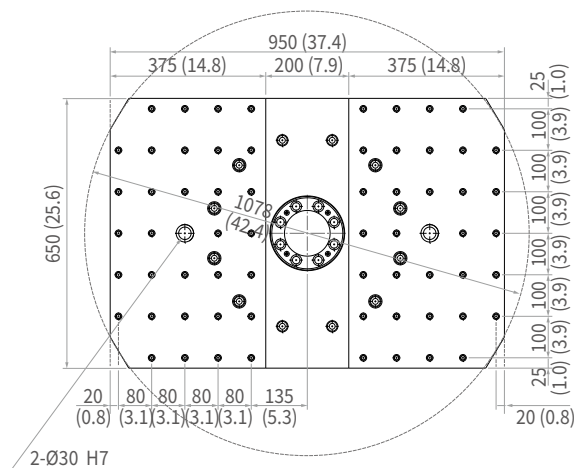
T-SLOT

TAP HOLE

Units : mm (inch)



T-SLOT

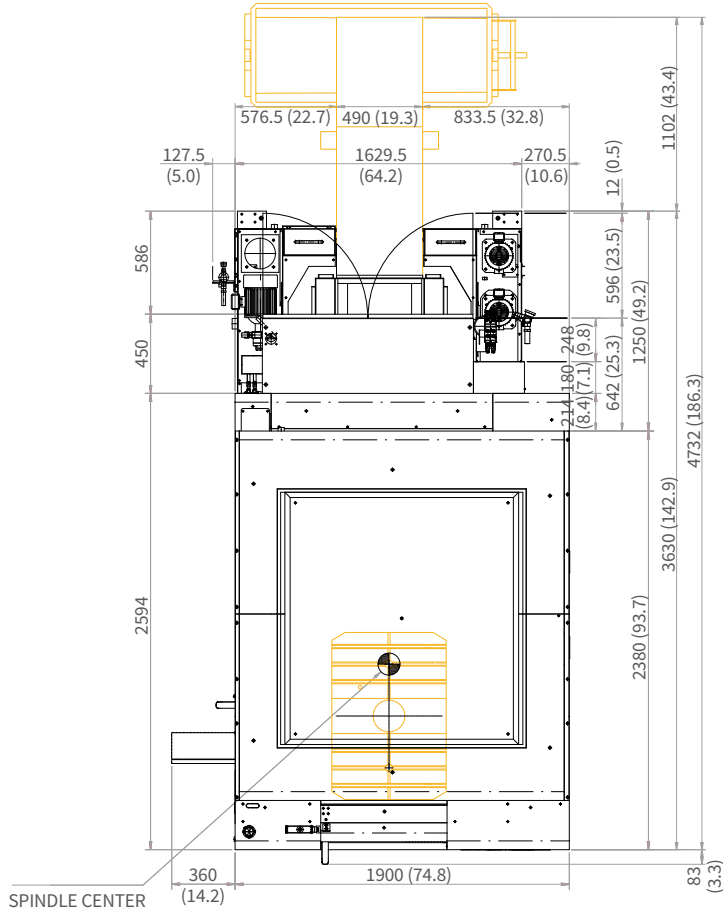


TAP SECTION

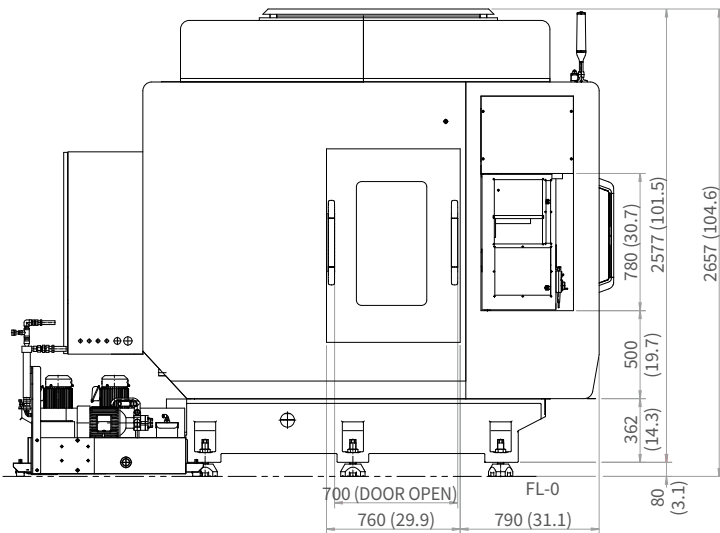
DIMENSIONS

Units : mm (inch)

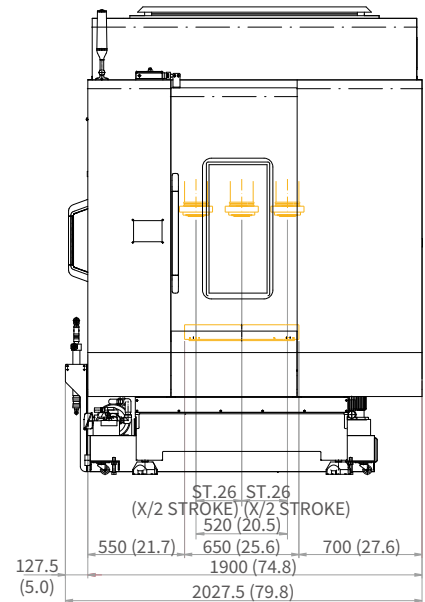
TOP



SIDE



FRONT



* Some peripheral equipment can be placed in other areas.

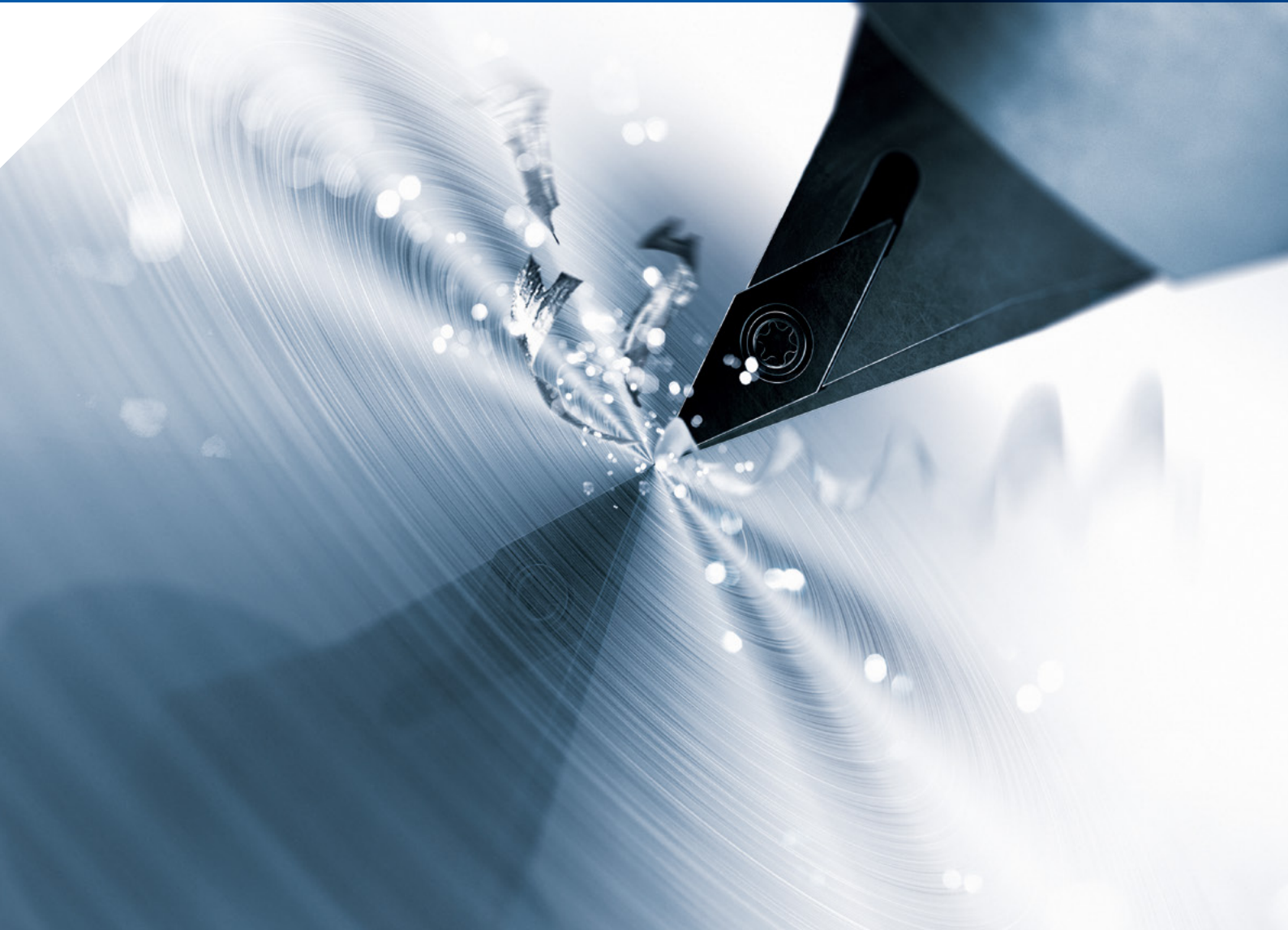
MACHINE SPECIFICATIONS

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}* MAS403 P40T-1(15°)
		Pull stud	-	
	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 selection		-	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.

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.

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.

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



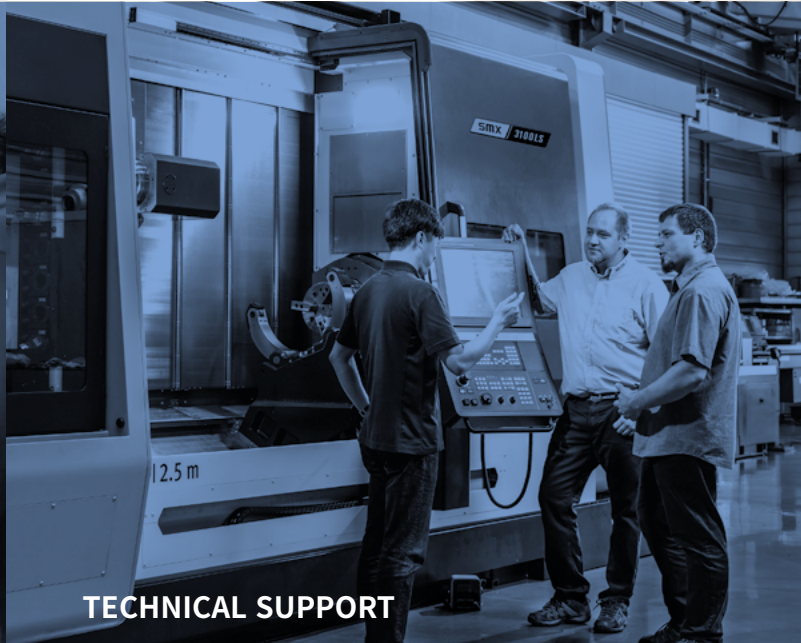
PARTS SUPPLY

- 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



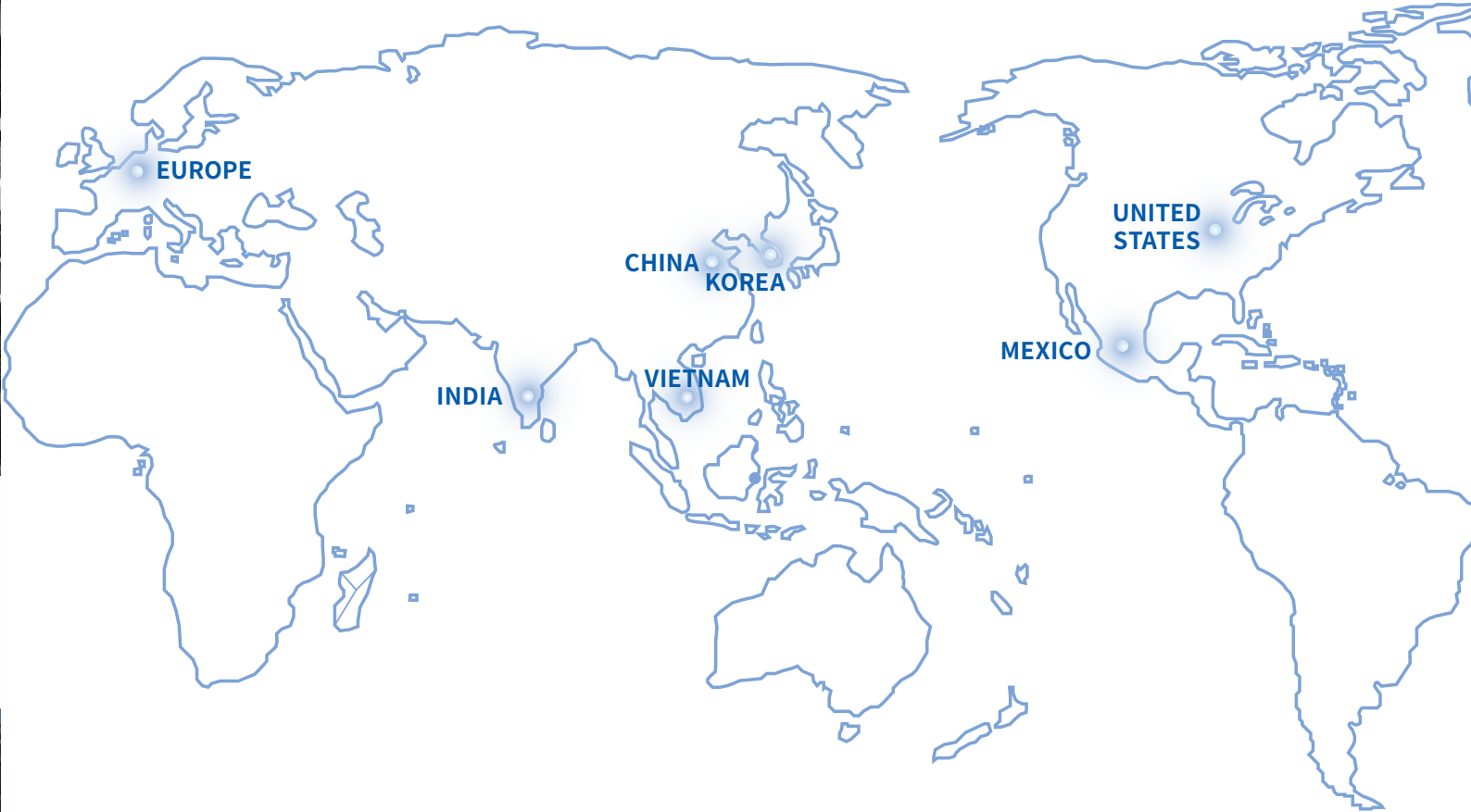
TECHNICAL SUPPORT

- 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



**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

No.82, Jakkur Village
Yelahanka Hobli,
Bangalore-560064

Tel: +91-80-2205-6900
E-mail: 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