HIGH PRODUCTIVITY SWIFT
VERTICAL MACHINING CENTER

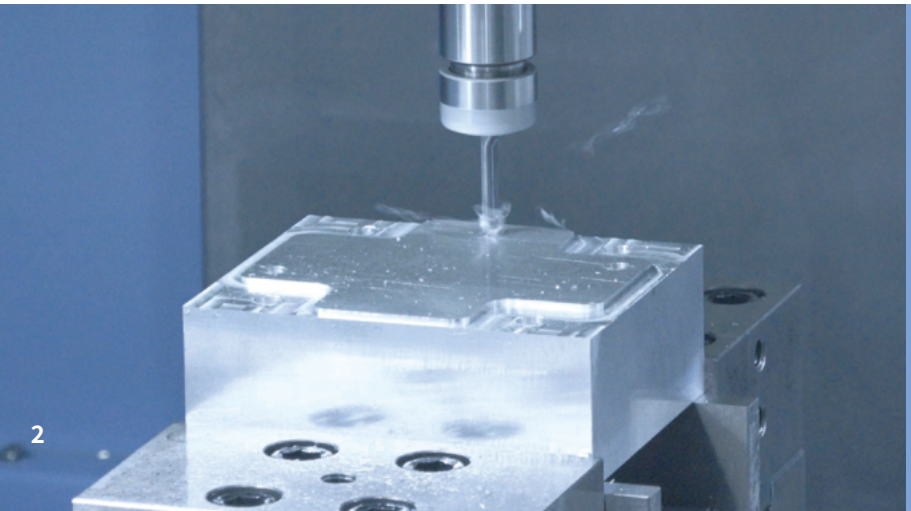
SVM

4100

DN SOLUTIONS

SVM 4100

The SVM4100 vertical machining center has been developed to meet the increased demand for the machining of aluminum die castings in the Automotive and IT industries. In addition, it can be used for general-purpose light-duty machining of steel parts. The machine's performance has been optimized to provide shorter cycle times by improving the acceleration/deceleration times of the XYZ axes and spindle, thereby reducing the non-cutting times. In order to design a machine that can handle a wide range of parts, DN Solutions has created a machine with the largest machining envelope in its class, together with many other important features such as thermal displacement correction for the direct-drive spindle and the EZ work.



Svm 4100 is a lightweight cutting optimization product that boasts excellent production performance and provides final production efficiency to customers who process lightweight materials such as aluminum.

NON-CUTTING TIMES HAVE BEEN DRASTICALLY REDUCED TO REALIZE THE HIGHEST PRODUCTIVITY IN ITS CLASS.

- Acceleration/Deceleration rates for the spindle and axis drives have been optimized to ensure high productivity.
- Tool change times (T-T-T and C-T-C) have been improved to reduce the non-cutting time between machining operations.

OPTIMIZED MACHINE DESIGN FOR FAST MACHINING OF LIGHTWEIGHT MATERIALS.

- A range of features are available to meet the customers' machining requirements, such as the automatic ATC shutter and programmable coolant nozzles.

SPINDLE RELIABILITY AND THERMAL DISPLACEMENT OPTIMIZATION

- The thermal displacement correction function is applied as standard to optimize machining accuracy and to compensate for temperature variations in the surrounding environment.
- DN Solutions's direct connection spindle motor technology is applied to minimize noise and vibration and ensure a high level of reliability over long periods of operation.
- Grease lubrication is used as standard to reduce running costs and provide an eco-friendly operation.

BASIC STRUCTURE

The SVM machine incorporates DN Solutions's traditional C-frame design structure,
but has been optimized for higher productivity when undertaking fast and light duty machining operations.

Travel distance (X x Y x Z axis)

X-axis
770 mm
30.3 inch

Y-axis
410 mm
16.1 inch

Z-axis
510 mm
20.1 inch

AXIS SYSTEM

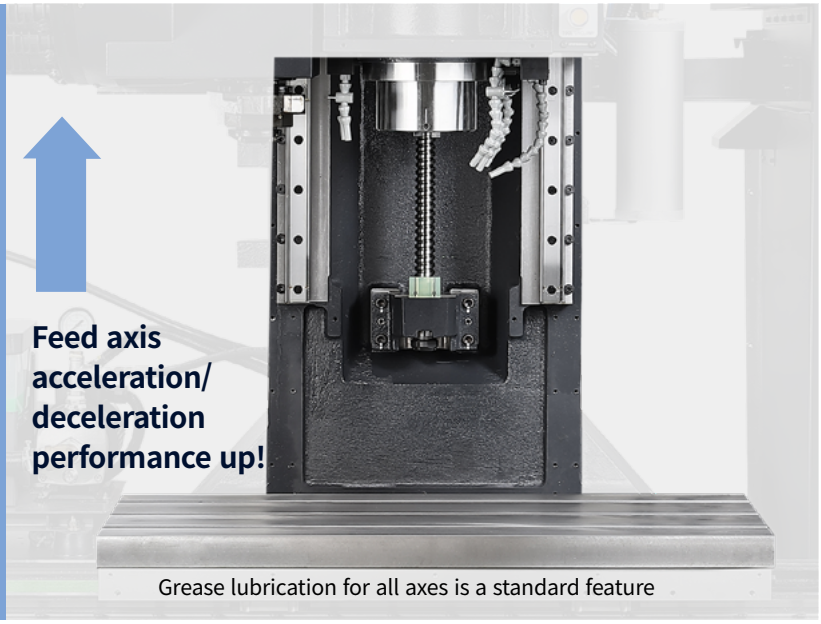
Non-cutting times have been drastically reduced by optimizing the acceleration/deceleration rates for the axis feed systems.

Rapid traverse rate (X / Y / Z axis)

36 / 36 / 36 m/min
1417.3 / 1417.3 / 1417.3 ipm

Acceleration/deceleration time (G)

0.72 / 0.6 / 0.6



Grease lubrication for all axes is a standard feature

SPINDLE

Optimized machine table size and maximum allowable load capacity provide the largest machining area in its class.

Max. spindle speed

12000 r/min

Max. spindle motor power

18.5 kW
24.8 Hp

Max. spindle motor torque

95.5 N·m
70.5 ft-lbs

TABLE

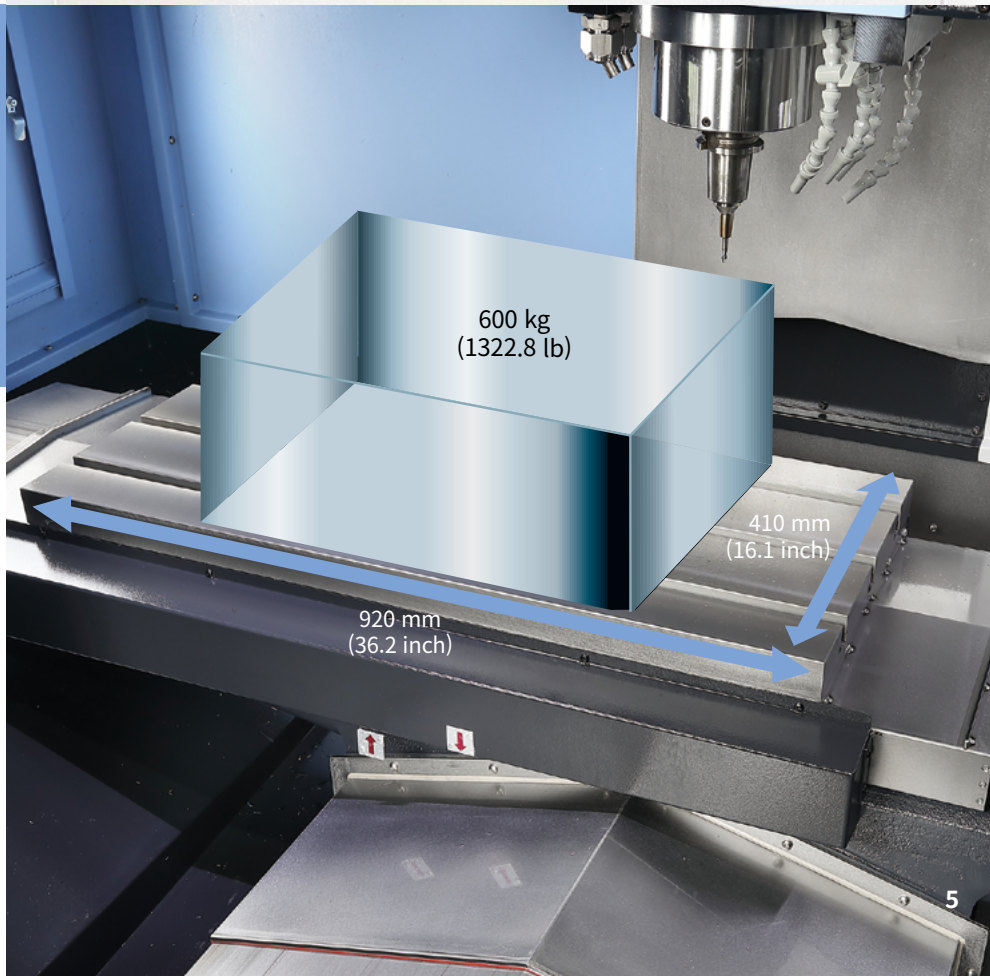
The direct connection type spindle is supplied as standard. The noise and vibration levels are reduced to improve operator comfort.

Table size

920 x 410 mm
36.2 x 16.1 inch

Max weight on table

600 kg
1322.8 lb



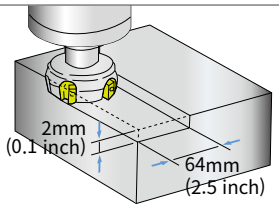
MACHINING PERFORMANCE

The SVM machines have excellent machining capabilities and can handle a full range of operations such as face milling, end milling, U-drilling, and tap machining. Productivity is improved productivity by optimizing non-cutting time.

Cutting performance

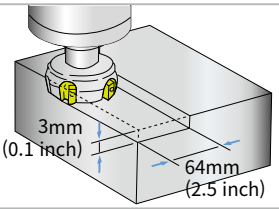
Face mill (ø80mm (3.15 inch)), z(*) : 6 Carbon steel (SM45C)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
460.8 (28.1)	1500	3600 (141.7)



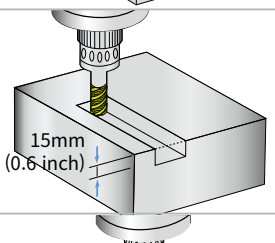
Face mill (ø80mm (3.15 inch)), z(*) : 6 Aluminium(AL6061)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
1728 (105.4)	1500	9000 (354.3)



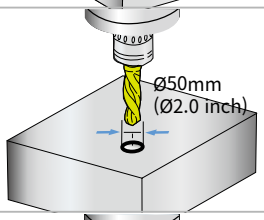
End mill (ø30mm (i.2 inch)) Carbon steel (SM45C)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
48 (2.9)	222	107 (4.2)



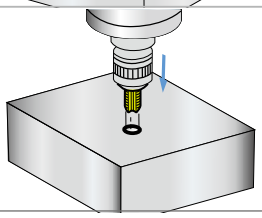
U-Drill (ø50mm (2.0 inch)) Carbon steel (SM45C)

Chip removal rate cm³/min (inch³/min)	Spindle speed r/min	Feedrate mm/min (ipm)
501 (30.6)	1500	255 (10.0)



Tap Carbon steel (SM45C)

Tap size mm	Spindle speed r/min	Feedrate mm/min (ipm)
M 36 x P 4.0	221	884 (34.8)



** The results, indicated in this catalogue are provided as an example only. They may not always be obtained due to differences in cutting environmental conditions.*
** number of teeth*

High productivity

** The results, indicated in this catalogue are provided as an example only. They may not always be obtained due to differences in cutting environmental conditions.*

A total of 117 M3 tap processing and POCKET internal end mill finishing: Tool change 8 times during processing

Cutting time

A company model 8min. 43sec.

SVM 4100 5min. 54sec. (D300 CNC)

Reduced by **32 %**

Mobile phone bracket (Company K)_7 tool changes during processing

Cutting time

A company model 1min. 45sec.

SVM 4100 1min. 25sec. (D300 CNC)

Reduced by **19 %**

TOOL CHANGE SYSTEM

In order to reduce the non-cutting time between machining operations, the tool change time has been optimized compared to similar models.

Tool to tool time

1.3 s

Chip to chip* time

3.3 s

* *The Chip-to-Chip time has been tested in accordance with DN Solutions's strict testing procedures, but may vary depending on different operating conditions.*

MAGAZINE

Tool storage capacity

30 ea

Brush (std.)

A barrier brush is used to prevent chip ingress into ATC area during machining.

ATC shutter option

An ATC shutter door can be specified instead of the brush to provide a higher level of protection from chip ingression.

STANDARD | OPTIONAL SPECIFICATIONS

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

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

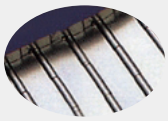
Description	Features		SVM 4100
Spindle	12000 r/min (Unit: kW(Hp), N·m(ft-lbs))	18.5/5.5 kW (24.8/7.4 Hp), 95.9 N.m (70.5 ft-lbs)	●
Magazine	Tool storage capacity	30 ea	●
Tool shank type	BIG PLUS BT40		●
	BIG PLUS CAT40		○
	BIG PLUS DIN40		○
Coolant	Flood + Base	200 L/min (1.1kW)	●
	TSC	None	●
		20 bar (1.5kW)	○
		70 bar (5.5 kW)	○
	PFC (Programmable Flood Coolant)		○
	SHOWER (200 L/min)		○
	Coolant chiller		○
Chip disposal	Chip conveyor	Chip pan	●
		Hinged type (Left/Right)	○
		Magnetic scraper type (Left/Right)	○
	Chip bucket		○
	Air blower		○
	AIR GUN		○
	Coolant gun		○
	Mist collector		○
Precision machining option	ATC	Auto shutter	○
	Linear scale	X / Y / Z axis	○
	HSCC (700 block)		●
	Spindle thermal compensation function	SENSORLESS TYPE	●
Measurement & Automation	Automatic tool measurement	TS27R_Renishaw	○
		ZX Speed_Blum	○
		OTS_Renishaw	○
		NC4_Renishaw	○
	Automatic tool breackage detection		○
	Automatic workpiece measurement	OMP60_Renishaw	○
		TC50_Blum	○
	Automatic front door with safty edge		○
4 axis Rotary table	S-200F4-DS		○
	4 axis ready	CABLING FOR SERVO/1-PNEUMATIC PIPING	○
Accessories	LED LAMP		●
	3-COLOR SIGNAL TOWER(LED)		●
	Tool load monitoring system		●
	EZ Guide i		●
	Auto power off		○
Customized Special Option	ANCHORING	SLIDE CLAMP & CHEMINCAL ANCHOR BOLT	○
	Automatic tool measurement	LTS_Renishaw	○
	Automatic tool breackage detection	MSC/BK9(NEEDLE TYPE ON MAGAZINE)	○

※*Please contact DN Solutions to select detail specifications*

⚠ 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

Chip conveyor option



Hinged belt

Magnetic scraper

Chip conveyor type	Material	Description
Hinged belt	Steel	Hinged belt chip conveyor, which is most commonly used for steel work [for cleaning chips longer than 30mm(1.2inch)], is available as an option.
Magnetic scraper	Cast Iron	Magnetic scraper type chip conveyor, which is ideal for die-casting work [for cleaning small chips], is available as an option.

Hydraulic / Pneumatic fixture line option

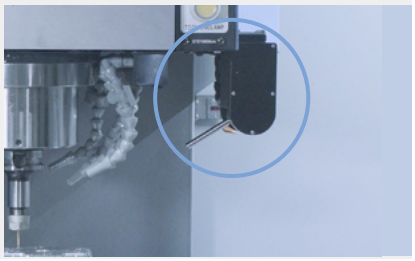
The user should prepare pipelines for hydraulic/pneumatic fixtures whose detailed specifications should be determined through discussions with DN Solutions.

4 axis rotary table option

High speed. The high-precision split system enables vertical and horizontal use, and provides a strong clamping force with its compact and high rigidity body design, and the double piston application.

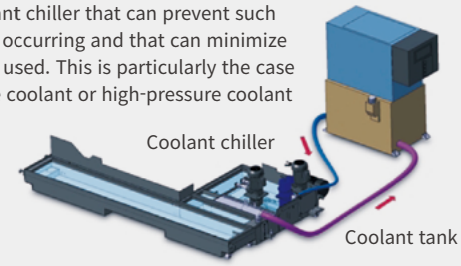
PFC(Programmable flood coolant)

The coolant nozzle direction is controlled by a program.
It is adjusted according to the required angle (steps 1 to 15), and it can be used for various tool lengths, thereby improving tool life.



Coolant chiller option

The heat generated by machining operations is circulated by the cutting oil. This heat is therefore transferred to the machine body, workpiece and fixtures, causing thermal deformation, which adversely affects precision. We recommend a coolant chiller that can prevent such temperature rises from occurring and that can minimize thermal deformation is used. This is particularly the case when a water-insoluble coolant or high-pressure coolant system is being used.



Chip bucket option

Capacity

300 L (79.3 gal)

Grease lubrication system

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

Yearly maintenance cost

Reduced by

Max. 60%

DN SOLUTIONS 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.

DN Solutions 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

iHMI touchscreen option

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	DN Solutions Fanuc i (0i PLUS) SVM 4100
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 MT Connect and FANUC OPC UA available.

EZ WORK

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

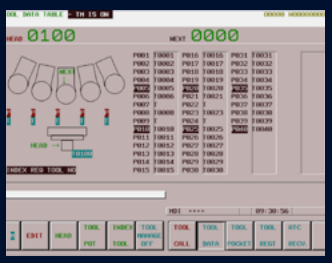
EZ work

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.

Conversational convenient function

EZ work Main screen

On the operation panel, press the CUSTOM1 button to display the initial EZ work screen.



Tool management

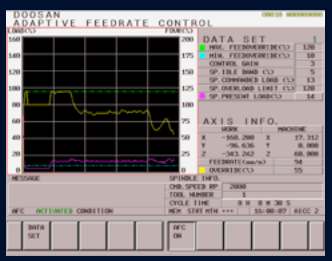
This function controls information on the tools in the tool magazine pots.

ATC recovery

In the event of an error during ATC (automatic tool changer) operations, follow the on-screen instructions for an easy and prompt solution.

Tool load monitoring

During cutting operations, abnormal loads caused by wear and tear of the tool are detected and an alarm is triggered to prevent further damage.



Adaptive Feed Control(AFC)

If tool overload is detected during operation, the feed rate is controlled to prevent the tool from being damaged.

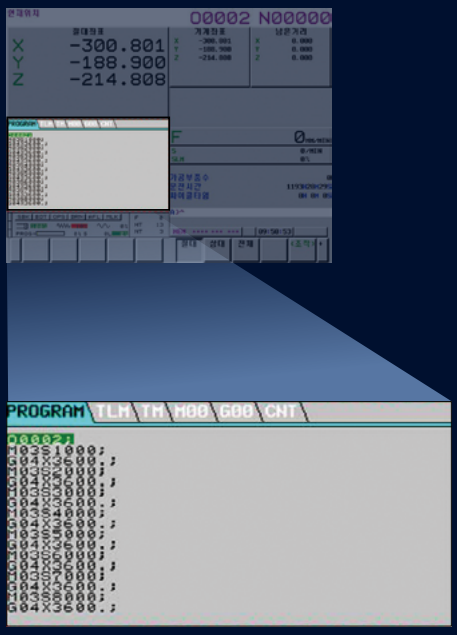
Thermal compensation function

A thermal error compensation function is provided as a standard feature to ensure stable cutting operations safe from potentially harmful environmental factors.

Pop-up function

Various EZ work functions can be monitored through the pop-up window on the NC main screen. (Press the CUSTOM2 button)

1. Display machining program
2. Tool Load Monitoring
3. Tool management data
4. M code list
5. G code list
6. Tool & Workpiece count



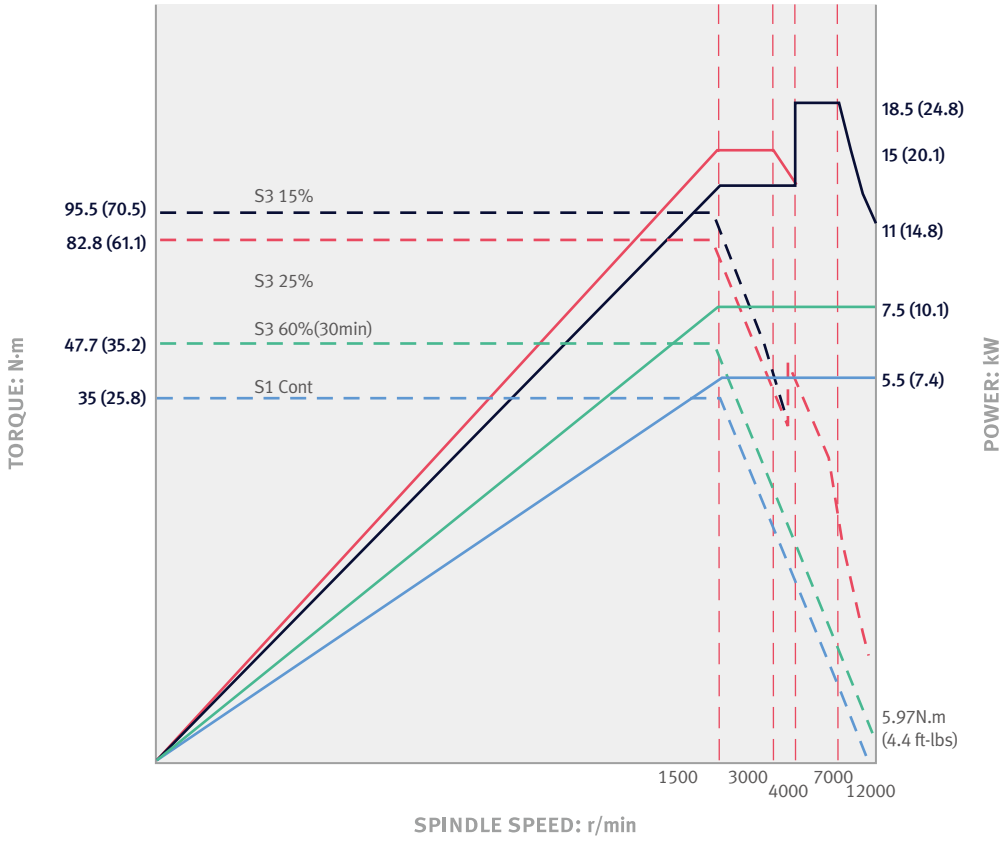
POWER | TORQUE

Torque

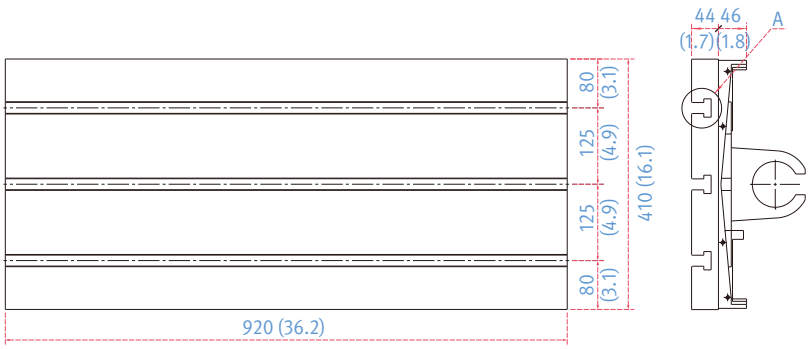
SPEED: **12000** r/min

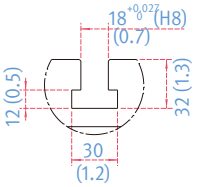
POWER: **18.5** kW
24.8 hp

TORQUE: **95.5** N · m
70.5 ft-lbs



Table

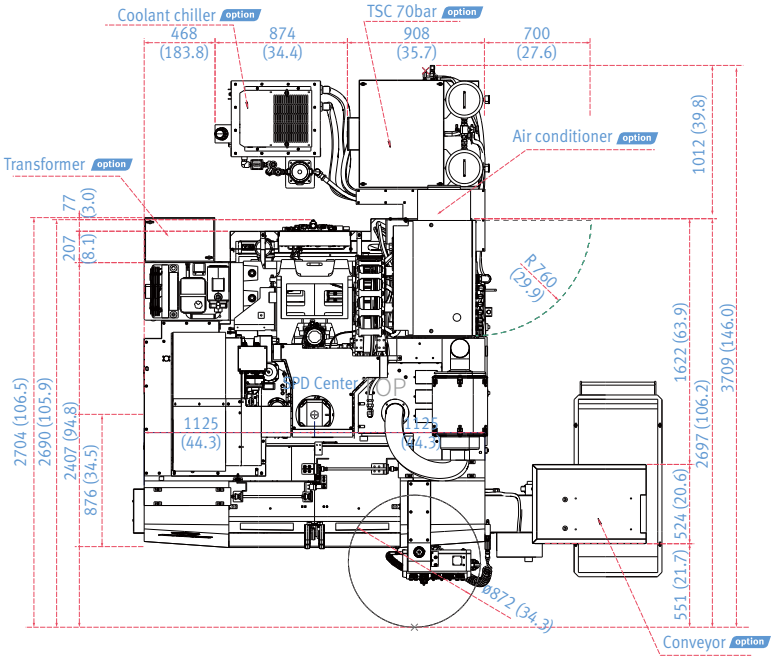




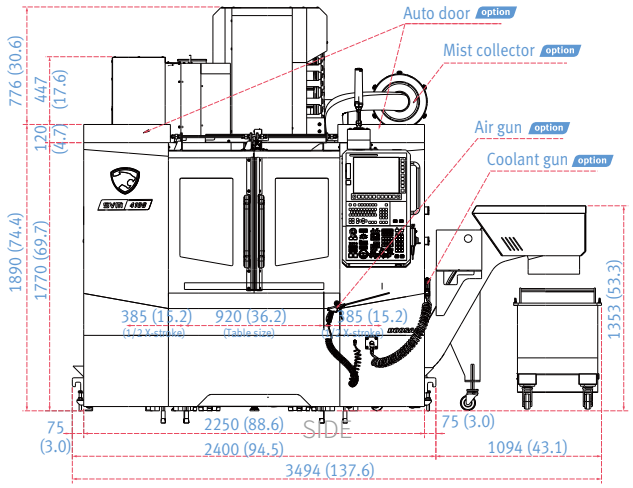
DIMENSIONS

Units : mm (inch)

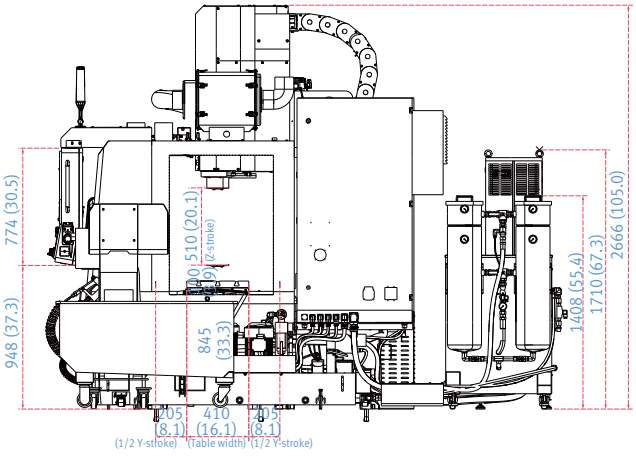
TOP



FRONT



SIDE



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

MACHINE SPECIFICATIONS

Description			Unit	SVM 4100
Travels	Travel distance	X axis	mm (inch)	770 (30.3)
		Y axis	mm (inch)	410 (16.1)
		Z axis	mm (inch)	510 (20.1)
	Distance from spindle nose to table top		mm (inch)	100~610 (3.9~24.0)
Table	Table size		mm (inch)	920 x 410 (36.2 x 16.1)
	Table loading capacity		kg (lb)	600 (1322.8)
	Table surface type		mm	T-SLOT (3-125 x 18H8)
Spindle	Max. spindle speed		r/min	12000
	Taper		-	ISO #40
	Max. spindle torque		N·m (ft-lbs)	95.5 (70.5)
	Max. spindle power (S3/continuous)		kW (Hp)	18.5/5.5 (24.8/7.4)
Feedrates	Rapid traverse rate	X axis	m/min (ipm)	36 (1417.3)
		Y axis	m/min (ipm)	36 (1417.3)
		Z axis	m/min (ipm)	36 (1417.3)
Automatic tool changer	Type of tool shank		-	BT 40 {CAT/ DIN}
	Tool storage capa.		m/min (ipm)	30
	Max. tool diameter	Continous	mm (inch)	80 (3.1)
		Without adjacent tools	mm (inch)	125 (4.9)
	Max. tool length		mm (inch)	300 (11.8)
	Max. tool weight		kg (lb)	6 (13.2)
	Tool selection			MEMORY RANDOM
	Tool change time (Tool-to-tool)		sec	1.3
	Tool change time (Chip-to-chip)		sec	3.3
Motor	Coolant pump motor power		kW (Hp)	1.1 (1.5)
Power source	Electric power supply (rated capacity)		kVA	24.8
	Compressed air supply		MPa (psi)	0.54
Tank capacity	Coolant tank capacity		L (gal)	240 (63.4)
Machine dimensions	Height		mm (inch)	2661 (104.8)
	Length		mm (inch)	2171 (85.5)
	Width		mm (inch)	2250 (88.6)
	Weight		kg (lb)	3850 (8487.7)
Contrel	NC system		-	DN Solutions Fanuc i Plus

{ } : option

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.

Global sales and service support network		51	**Technical centers** Technical center, Sales support, Service support, Parts support
4	Corporations	200	Service posts
156	Dealer networks	3	Factories

CUSTOMER SUPPORT AND SERVICES

We're there for you whenever you need us.

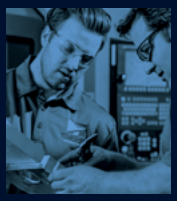
We help our customers operate at maximum efficiency by providing them with a range of tried, tested and trusted services - from pre-sales consultancy to post-sales support.

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

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