



Doosan Machine Tools

HIGH PRODUCTIVITY SWIFT VERTICAL MACHINING CENTER

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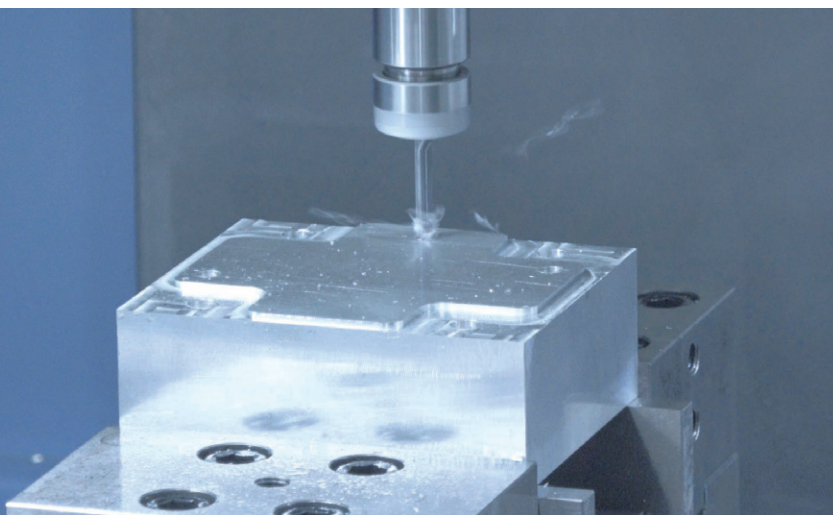
# SVM

4100



# SVM 4100

The SVM4100 vertical machining center has been developed to meet the increased demand for machining of Aluminum die castings in both 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 reducing the acceleration/ deceleration times of the XYZ axes and spindle, thereby minimizing the non-cutting time. In order to handle the demands of a wide variety of parts, Doosan have provided a machine with the largest machining area in its class, together with many important features such as thermal displacement correction for the direct drive spindle and Easy Operation Package (EOP).



SVM 4100은 뛰어난 생산 성능을 자랑하는 경량절삭 최적화 제품으로 알루미늄과 같은 경량 소재를 가공하는 고객분들께 최고의 생산 효율성을 제공하여 드립니다.



### 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 (TtoT and CtoC) have been shortened to reduce the non-cutting time between machining operations.

### OPTIMIZED MACHINE DESIGN FOR FAST MACHINING OF LIGHTWEIGHT MATERIALS.

- Various machine features are available to meet the customers' machining requirements, such as 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 even during temperature variations in the surrounding environment.
- Doosan's direct connection spindle motor technology is applied to minimize noise and vibration and ensure a high level of reliability over long periods.
- Grease lubrication is used as standard to reduce running cost and provide eco-friendly operation.

# BASIC STRUCTURE

The SVM machine incorporates Doosan's traditional C-frame design structure, but is optimized to provide high productivity for fast, light duty machining operations.

## Travel distance (X x Y x Z axis)

X-axis

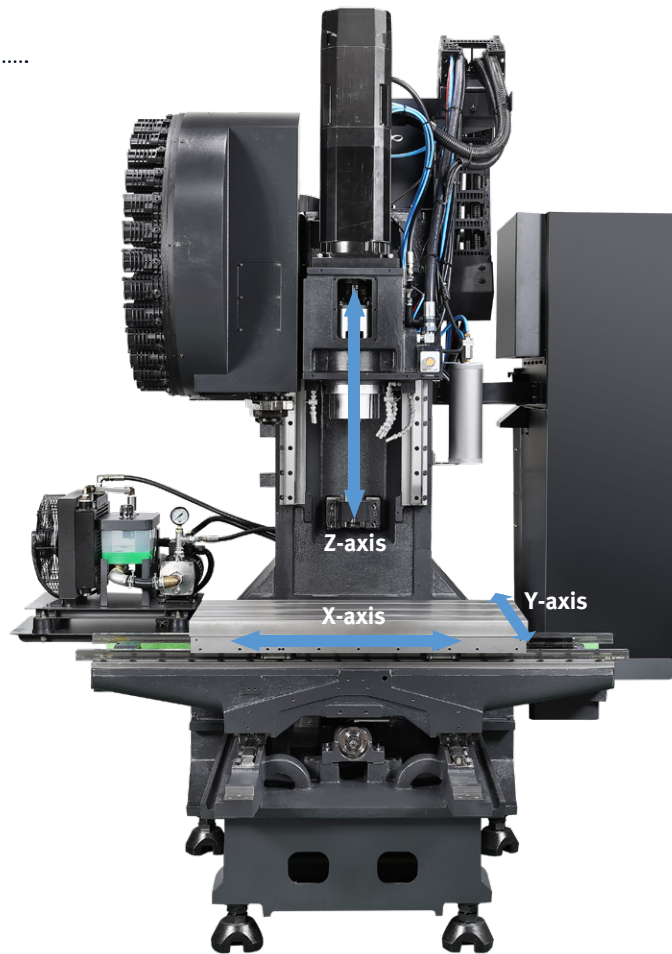
**770** mm  
30.3 inch

Y-axis

**410** mm  
16.1 inch

Z-axis

**510** mm  
20.1 inch



## AXIS SYSTEM

The non-cutting time has been drastically reduced by optimizing the acceleration/deceleration rates for the axis feed systems.

### Rapid traverse rate (X / Y / Z axis)

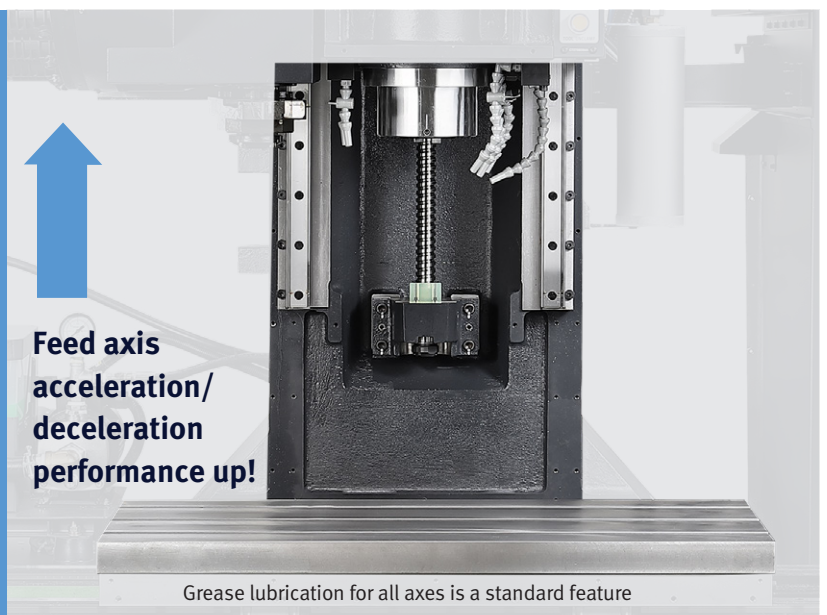
**36 / 36 / 36** m/min  
1417.3 / 1417.3 / 1417.3 ipm

### Acceleration/deceleration time (G)

**0.72 / 0.6 / 0.6**



**Feed axis  
acceleration/  
deceleration  
performance up!**



# TABLE

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



# SPINDLE

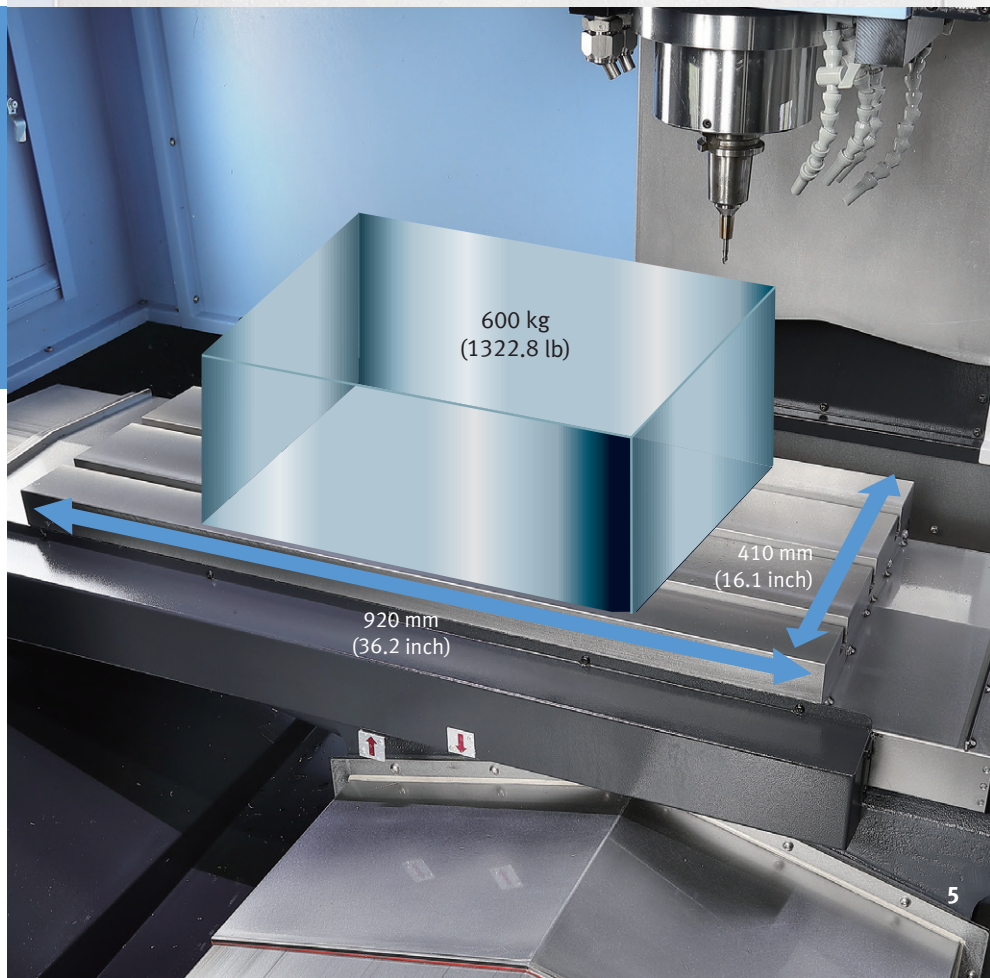
The direct connection type spindle is applied as standard. The noise and vibration levels were minimized to improve environmental conditions for the operator.

## 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 series provides excellent machining capabilities such as face mill, end mill, U-drill, and tap machining, and improved productivity by optimizing non-cutting time.

## Cutting performance

|   |                        |                          |  |
|---|------------------------|--------------------------|--|
| <b>Face mill (ø80mm (3.15 inch)), z(*) : 6 Carbon steel (SM45C)</b> |                        |                          |  |
| Chip removal rate<br>cm <sup>3</sup> /min (inch <sup>3</sup> /min)  | Spindle speed<br>r/min | Feedrate<br>mm/min (ipm) |  |
| 460.8 (28.1)  | 1500                   | 3600 (141.7)             |  |
| <b>Face mill (ø80mm (3.15 inch)), z(*) : 6 Aluminium(AL6061)</b>    |                        |                          |  |
| Chip removal rate<br>cm <sup>3</sup> /min (inch <sup>3</sup> /min)  | Spindle speed<br>r/min | Feedrate<br>mm/min (ipm) |  |
| 1728 (105.4)  | 1500                   | 9000 (354.3)             |  |
| <b>End mill (ø30mm (1.2 inch)) Carbon steel (SM45C)</b>             |                        |                          |  |
| Chip removal rate<br>cm <sup>3</sup> /min (inch <sup>3</sup> /min)  | Spindle speed<br>r/min | Feedrate<br>mm/min (ipm) |  |
| 48 (2.9)  | 222                    | 107 (4.2)                |  |
| <b>U-Drill (ø50mm (2.0 inch)) Carbon steel (SM45C)</b>              |                        |                          |  |
| Chip removal rate<br>cm <sup>3</sup> /min (inch <sup>3</sup> /min)  | Spindle speed<br>r/min | Feedrate<br>mm/min (ipm) |  |
| 501 (30.6)  | 1500                   | 255 (10.0)               |  |
| <b>Tap Carbon steel (SM45C)</b>                                     |                        |                          |  |
| Tap size<br>mm  | Spindle speed<br>r/min | Feedrate<br>mm/min (ipm) |  |
| M 36 x P 4.0  | 221                    | 884 (34.8)               |  |

\* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

\* number of teeth

## High productivity

\* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

A total of 117 M3 or less tap processing and POCKET internal end mill finishing \_ Tool change 8 times during processing



### Cutting time

|   |                         |
|---|-------------------------|
| A company model                         | 8분 43초                  |
| <b>SVM 4100 5min. 54sec. (D300 CNC)</b> | ← Reduced by <b>32%</b> |

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



### Cutting time

|   |                         |
|---|-------------------------|
| A company model                         | 1min. 45sec.            |
| <b>SVM 4100 1min. 25sec. (D300 CNC)</b> | ← Reduced by <b>19%</b> |

# TOOL CHANGE SYSTEM

In order to reduce the non-cutting time between machining operations, the tool change time has been optimized compared to previous similar models. The tool magazine offers a high level of reliability and can store 30 tools as standard.

## Tool to tool time

**1.3 s**

## Chip to chip\* time

**3.3 s**

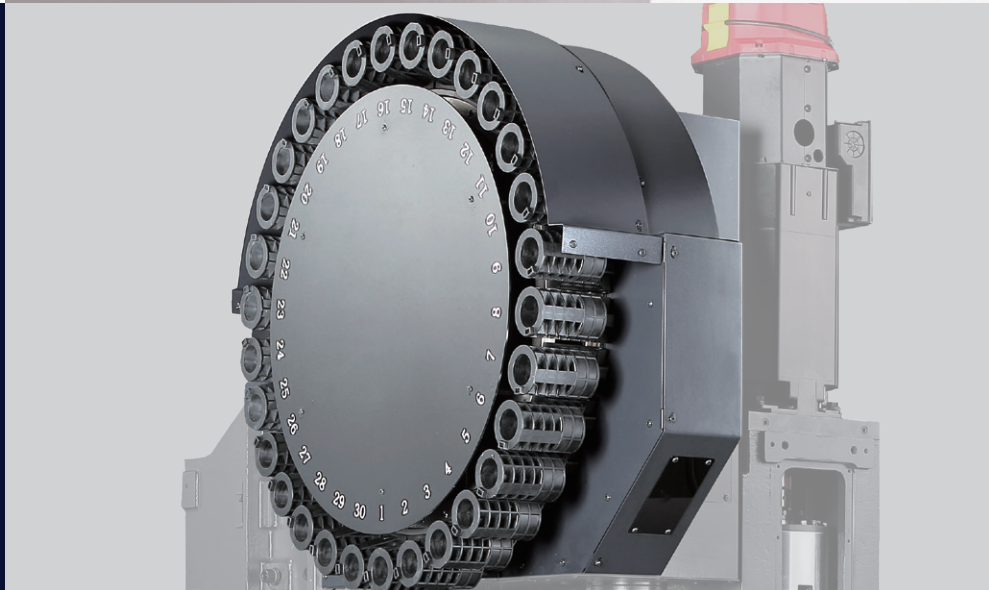
*\* The Chip-to-Chip time has been tested in accordance with Doosan's strict testing conditions, but may vary depending on the user's operating conditions.*



# MAGAZINE

## Tool storage capacity

**30 ea**



## Brush (std.)

A barrier brush is used to prevent the ingress of chips into ATC area during metal cutting.

## ATC shutter option

An ATC Shutter door can be applied instead of the brush to provide a higher level of protection in the event of some machining operations producing high volumes of chips or in close proximity to the ATC



# STANDARD & OPTIONAL SPECIFICATIONS

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

● Standard ○ Optional X Not applicable

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

\* Please contact Doosan to select detail specifications



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.



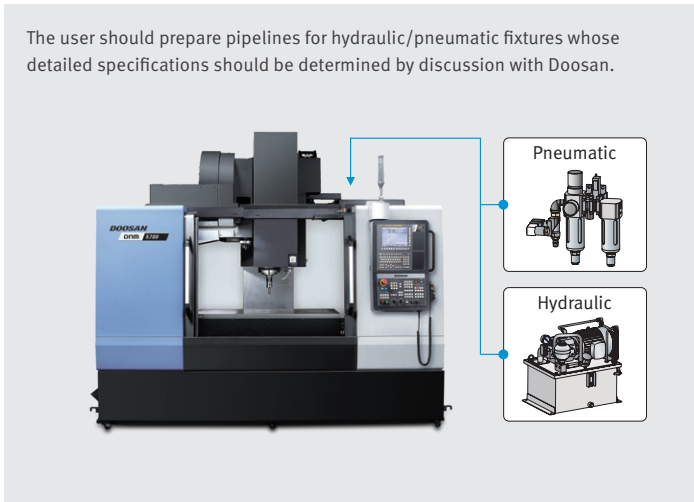
# PERIPHERAL EQUIPMENT

## Chip conveyor option



| 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.                  |

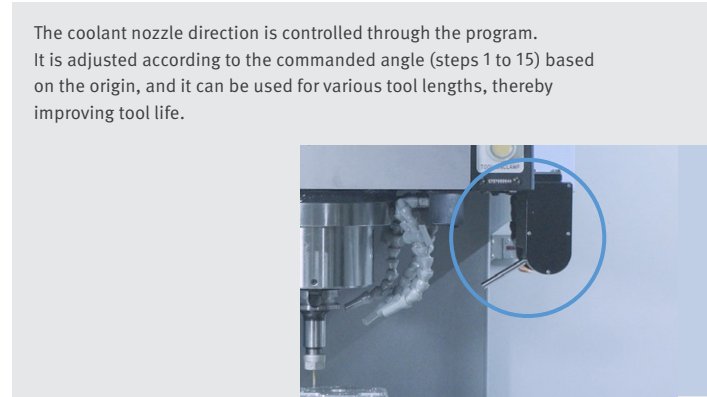
## Hydraulic / Pneumatic fixture line option



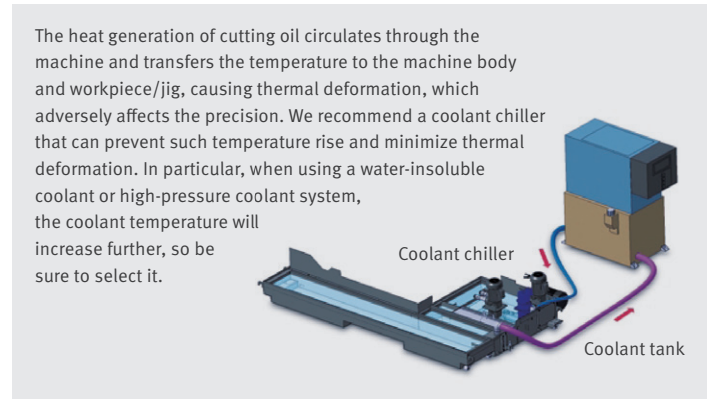
## 4 axis rotary table option



## PFC(Programmable flood coolant)



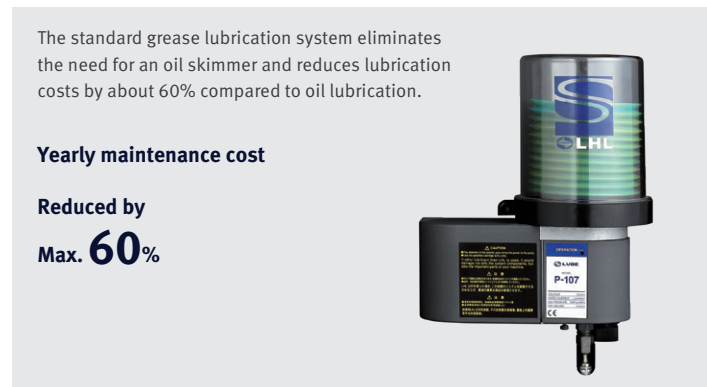
## Coolant chiller option



## Chip bucket option



## Grease lubrication system



# DOOSAN FANUC i PLUS

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

## 15 inch screen + new operation panel

DOOSAN 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.



## 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.

## Doosan 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



# NUMERIC CONTROL SPECIFICATIONS

# FANUC

| Item                        | Specifications                                  | Doosan Fanuc i (F0i-F 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                    | Note *2) Available Option only with 15" Touch LCD (iHMI Only) |
| 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  |
|                             | AI contour control II                           | G5.1 Q , 200 Blocks   |
|                             | AI contour control II                           | G5.1 Q , 600 Blocks   |
|                             | AI contour control II                           | G5.1 Q , 1000 Blocks  |
|                             | High smooth TCP                                 | X   |
| Operation guidance function | EZ Guidei (Conversational Programming Solution) | ○   |
|                             | iHMI with Machining Cycle                       | Note *1) Only with 15" Touch LCD standard                     |
|                             | EZ Operation package                            | ●   |
| Setting and display         | CNC screen dual display function                | ●   |
| Network                     | FANUC MTConnect                                 | ⊕   |
|                             | FANUC OPC UA                                    | ⊕   |
|                             | Display unit                                    | 10.4" color LCD   |
| Others                      | 15" color LCD                                   | ●   |
|                             | 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   |

\*2Fanuc i plus iHMI 적용시 선택 가능  
Network: FANUC MTConnect and FANUC OPC UA available.

● Standard ○ Optional X Not Available ⊕ Available

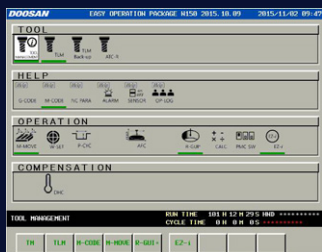
# EASY OPERATION PACKAGE

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

## Easy operation package (EOP)

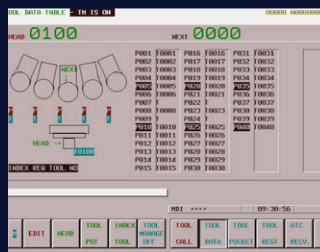
The EOP package delivers speed and efficiency. This menu-driven innovation not only helps customers reduce setup times, but also simplifies common tasks and procedures, reducing the potential for errors. EOP reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.

## Conversational convenient function



### EOP Main screen

On the operation panel, press the CUSTOM1 button to make the initial EOP screen show up.



### Tool management

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

## Pop-up function

Various EOP 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



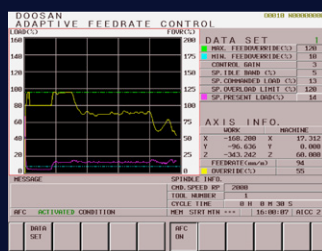
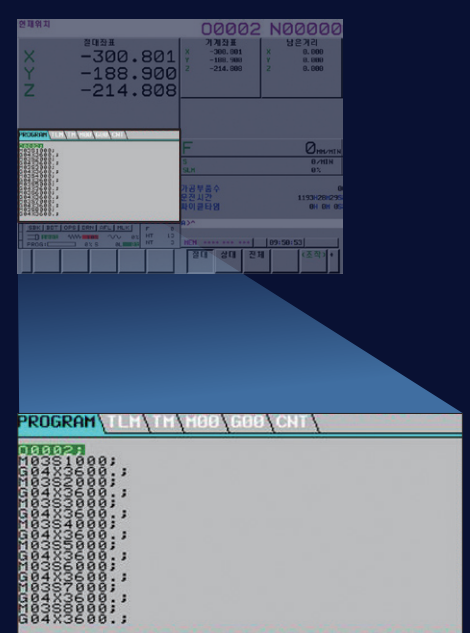
### ATC recovery

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



### Tool load monitoring

During cutting operation, abnormal load caused by wear and tear of the tool is 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 secure stable cutting safe from potentially harmful environmental factors.

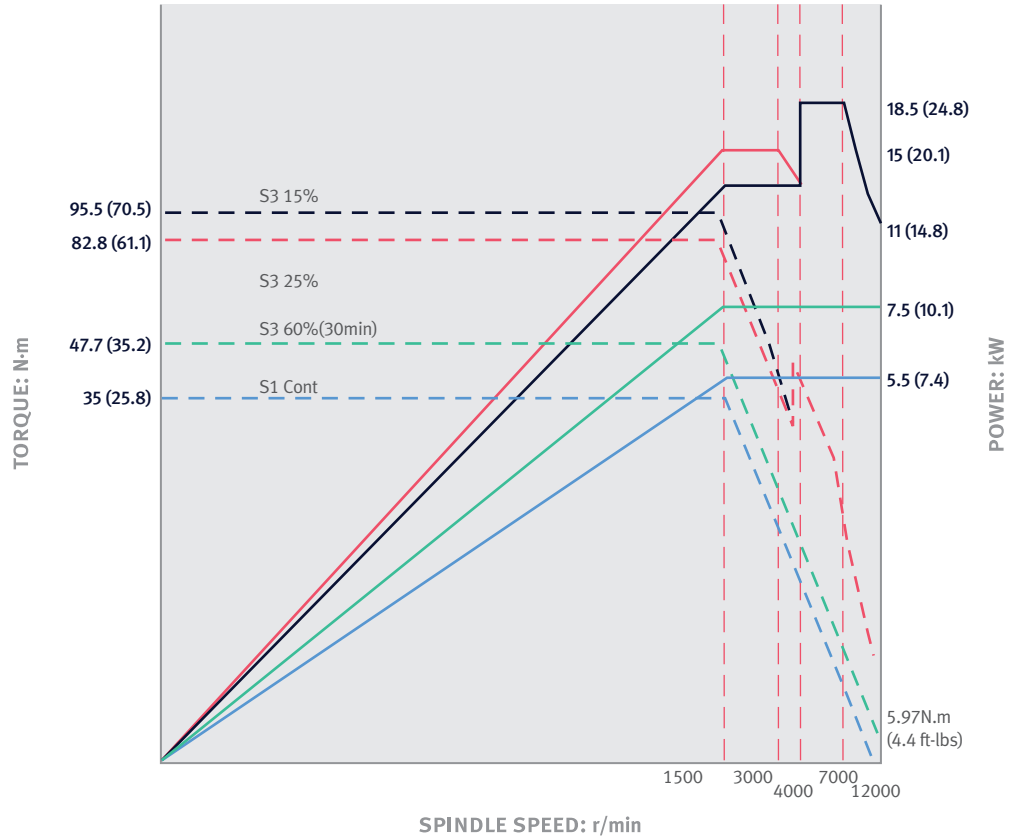
# POWER & TORQUE

## Torque

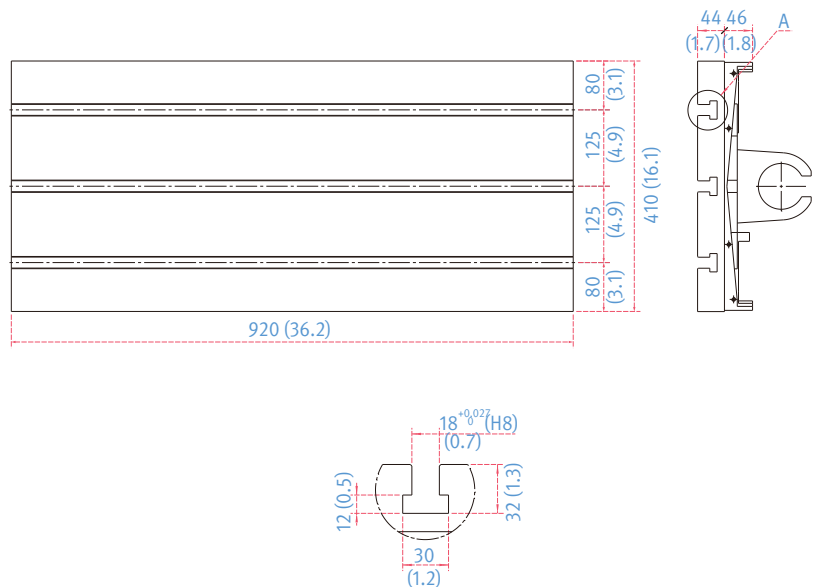
SPEED: **12000** r/min

POWER: **18.5** kW  
24.8 hp

TORQUE: **95.5** N·m  
70.5 ft-lbs



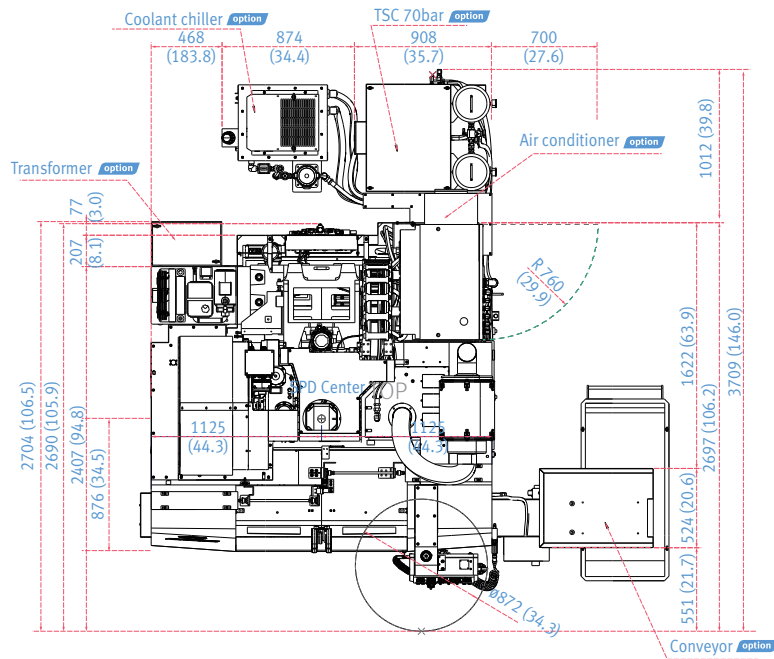
## Table



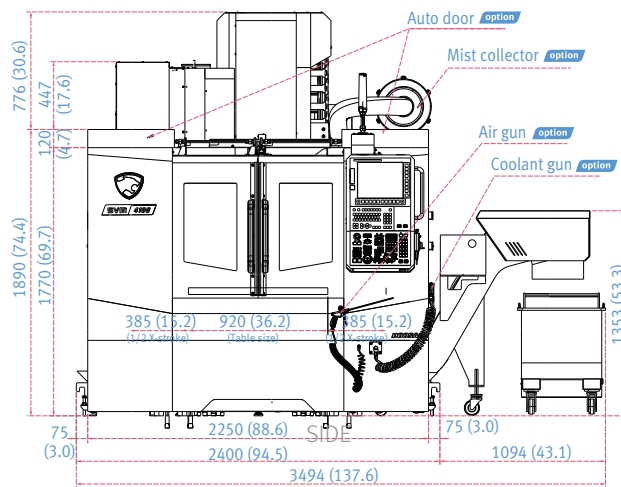
# DIMENSIONS

Units : mm (inch)

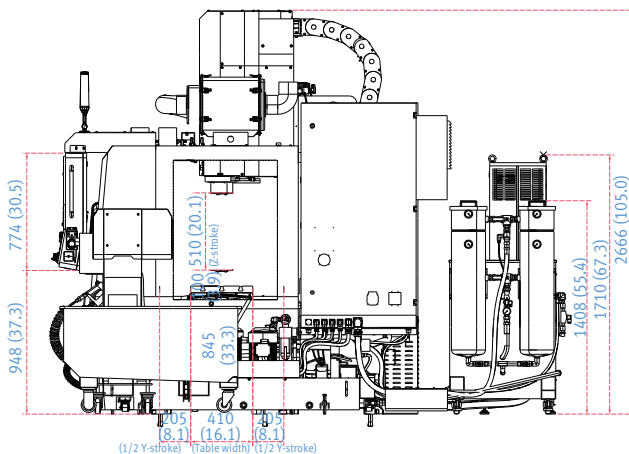
TOP



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                      | Continuous             | 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)           |
| Control                         | NC system                               |                        | -            | DOOSAN Fanuc i Plus     |

# 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 |                 | <b>51</b>  | <b>Technical centers</b><br>Technical center, Sales support, Service support, Parts support |
| <b>4</b>                                 | Corporations    | <b>200</b> | <b>Service posts</b>  |
| <b>167</b>                               | Dealer networks | <b>3</b>   | <b>Factories</b>  |



## 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



#### **Head Office**

22FT Tower, 30, Sowol-ro 2-gil  
Jung-gu, Seoul, Korea, 04637  
Tel: +82-2-6972-0370/0350  
Fax: +82-2-6972-0400

#### **Doosan Machine Tools America**

19A Chapin Road, Pine Brook  
New Jersey 07058, United States  
Tel: +1-973-618-2500  
Fax: +1-973-618-2501

#### **Doosan Machine Tools Europe**

Emdener Strasse 24, D-41540  
Dormagen, Germany  
Tel: +49-2133-5067-100  
Fax: +49-2133-5067-111

#### **Doosan Machine Tools India**

No.82, Jakkuar Village  
Yelahanka Hobli, Bangalore-560064  
Tel: + 91-80-2205-6900  
E-mail: [india@doosanmt.com](mailto:india@doosanmt.com)

#### **Doosan Machine Tools 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

#### **Sales inquiry**

[sales@doosanmt.com](mailto:sales@doosanmt.com)

\*For more details, please contact Doosan Machine Tools.

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