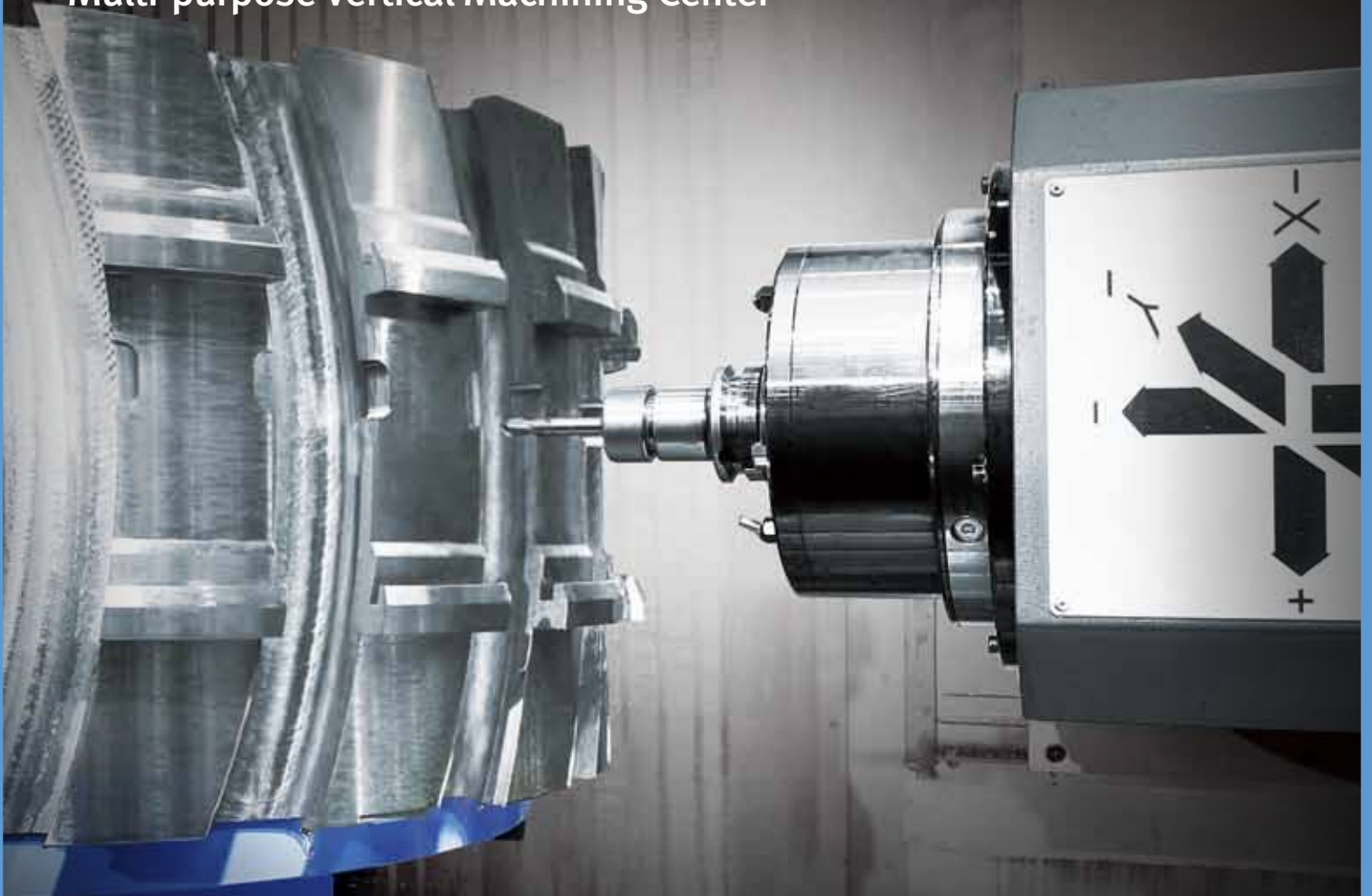


DOOSAN



VCF 850 II series

Multi-purpose Vertical Machining Center



VCF 850 II series

VCF 850 II
VCF 850L II
VCF 850SR II
VCF 850LSR II



**MACHINE
GREATNESS™**

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VCF 850 II series

The VCF850 II Series is a new product of multi-purpose, vertical machining centers suitable for a wide range of applications. In the upgraded VCF850 II series, high-rigidity B-axis has been applied to improve cutting performance and durability. As a moving-column type of machine, the VCF850 II Series offers an X-axis travel distance of 3 meters, and enhanced work convenience and efficiency with the inclusion of various optional devices including a rotary table and center partition, leading to enhanced productivity and added value.



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Sample work



High performance & High rigidity on B-Axis

The high-rigidity Roller Gear Cam structure with B-axis provides excellent cutting performance and durability.

Enhanced productivity with a wide range of applicability

Inclusion of rotary table, center partition, and pick-up magazine – features that will help the user to more than double machining efficiency.

Multi-purpose machine tool capable of simultaneous cutting with 3 to 5 axes

Simultaneous cutting operation from 3 to 5 axes (based on X-axis of 2 m and 3 m) – a real multi-purpose machine.

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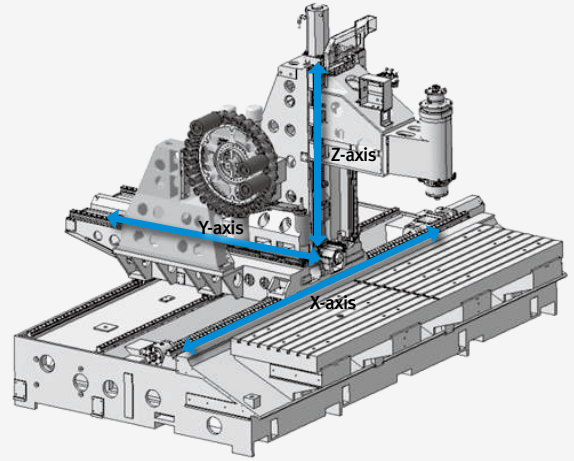
Basic Structure

Fixed table, column moving structure realizes compact machine size with a wide X axis, maximizing the users' satisfaction.

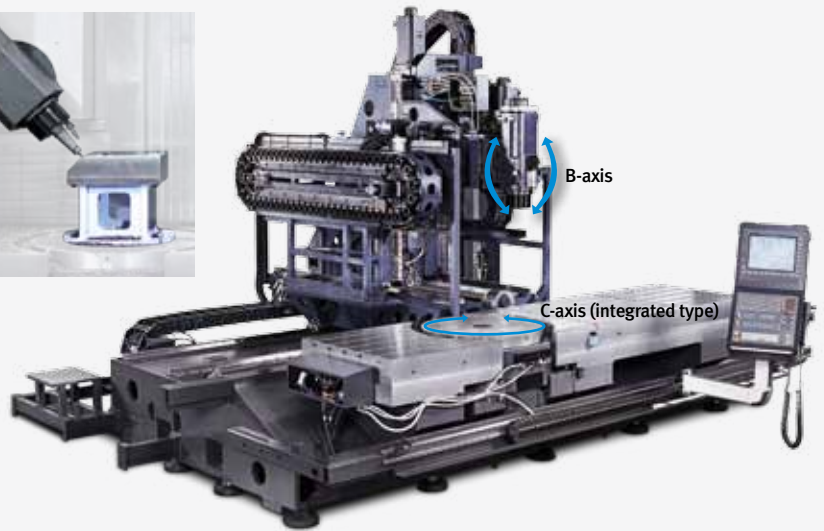
Multi-purpose Vertical Machining Center

VCF 850 II Series is a new line of multifunctional machine tools developed according to a new design concept. Everything from small parts to the largest work pieces with complicated shapes can be mass produced with 3 to 5 selectable axes.

VCF 850 / L II



VCF 850SR / LSR II



Swivel head



Horizontal or vertical type option

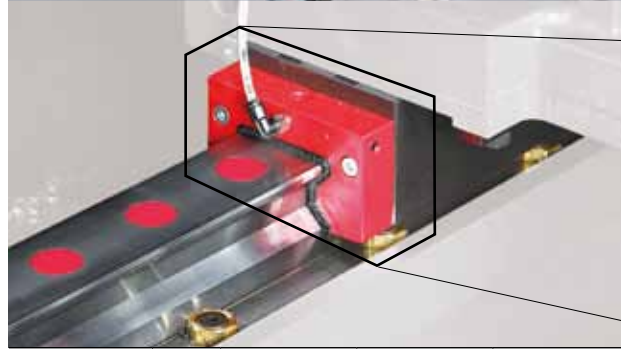
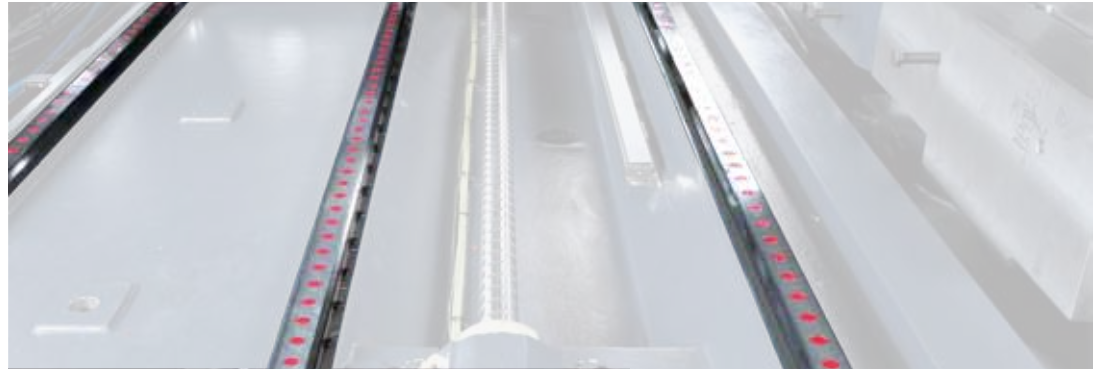


Axis system

The linear axes are equipped with roller LM Guideways for increased rigidity and a cooling system as standard features to minimize thermal error.

Stable and Fast axes Structure

Roller-type LM Guideways and high rigidity coupling realize high rigidity and outstanding accuracy of linear axes system.



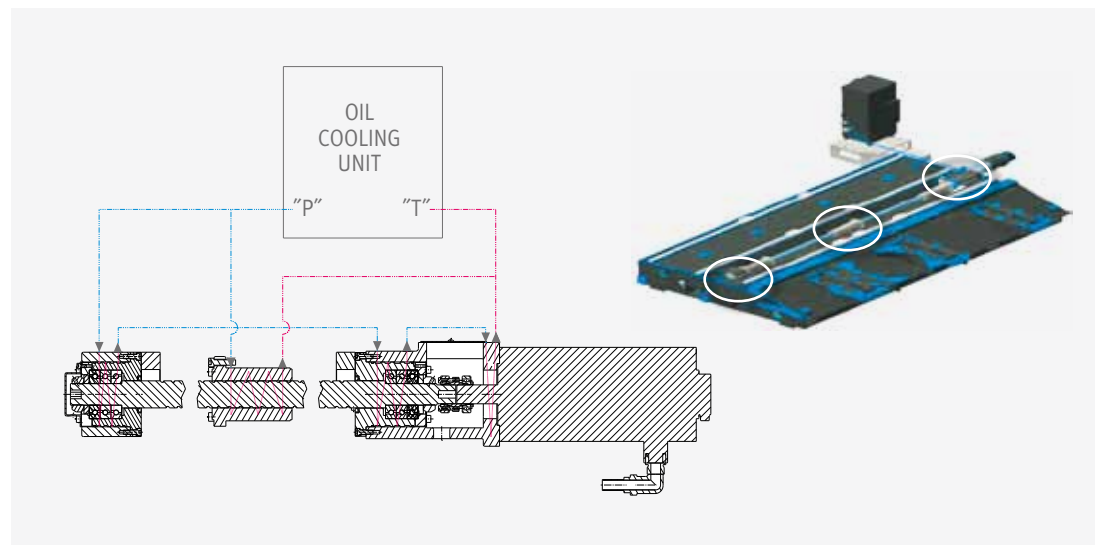
Description	Unit	X	Y	Z
Travel distance	mm (inch)	3000 {2000*} (118.1 {78.7}*)	850 (33.5)	800 (31.5)
Type		Roller type		
LMG structure	rows	3	2	2
Rapid traverse	m/min (ipm)	40 (1574.8)		

High rigidity, high accuracy
Roller type
LM Guideway

★VCF 850 II

Cooling System for High Accuracy*

The temperature of the ball screw nuts and bearing housings are maintained at optimal levels with a cooling system designed to minimize thermal error and maintain the rigidity of the feed system.



★ All machines and all axes

Spindles

Built-in spindles deliver outstanding reliability and are cooled down to minimize thermal error and guarantee excellent accuracy during long periods of operation.

Built-in Spindle

Delivers the highest productivity and reliability at the lowest noise and vibration levels.

System	Type	Speed r/min	Spindle	
			Power kW (Hp)	Torque N·m (ft·lb)
FANUC	ISO #40	12000	22/18.5 (29.5/24.8)	204 (150.6)
		18000	22/18.5 (29.5/24.8)	117.7 (86.9)
HEIDENHAIN		12000	32/24 (42.9/32.2)	126.3 (93.2)
		18000	30/24 (40.2/32.2)	155 (114.4)

Swivel head

Roller Gear Cam structure on B-axis offers excellent cutting performance and excellent durability.

220° Rotatable B Axis

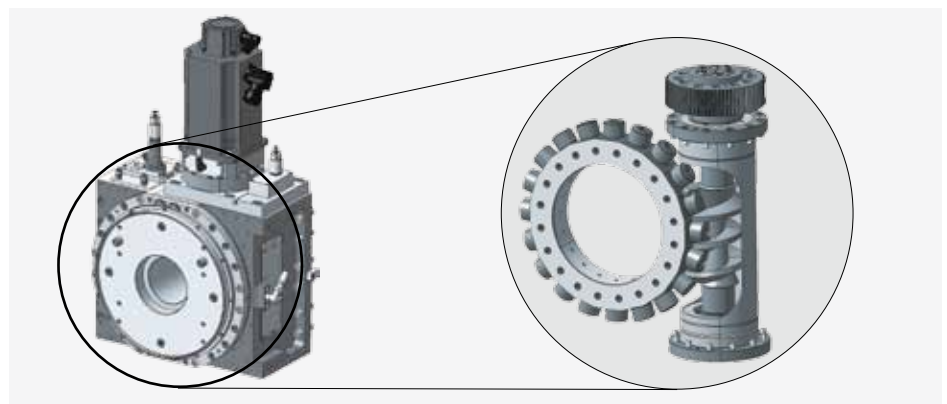
220° rotatable spindle suitable for milling taper surfaces.



Type	Axis	Speed r/min	Travel deg	Rotary encoder
Roller Gear Cam	B-axis	50	220 (+110, -110)	Standard

Roller Gear Cam structure as a standard

It is possible to precision machine for a long time that no backlash caused by abrasion.

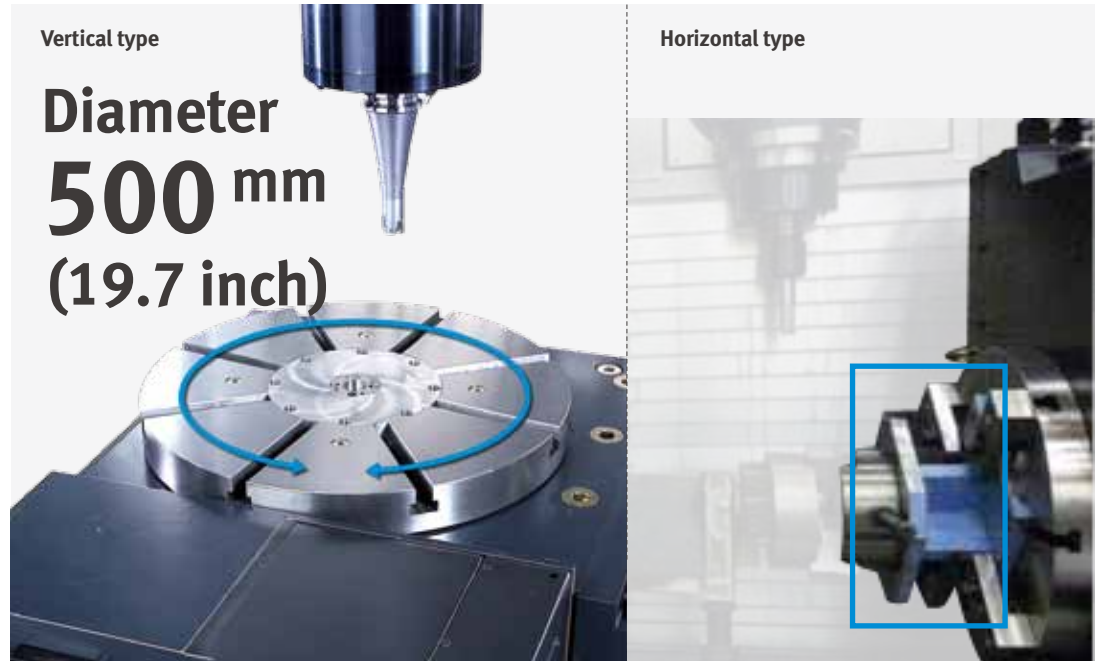


Rotary Table

Doosan's mounted or integrated rotary table is available according to the customer's requirements, e.g. shape cutting or side cutting to realize diverse solutions of excellent quality.

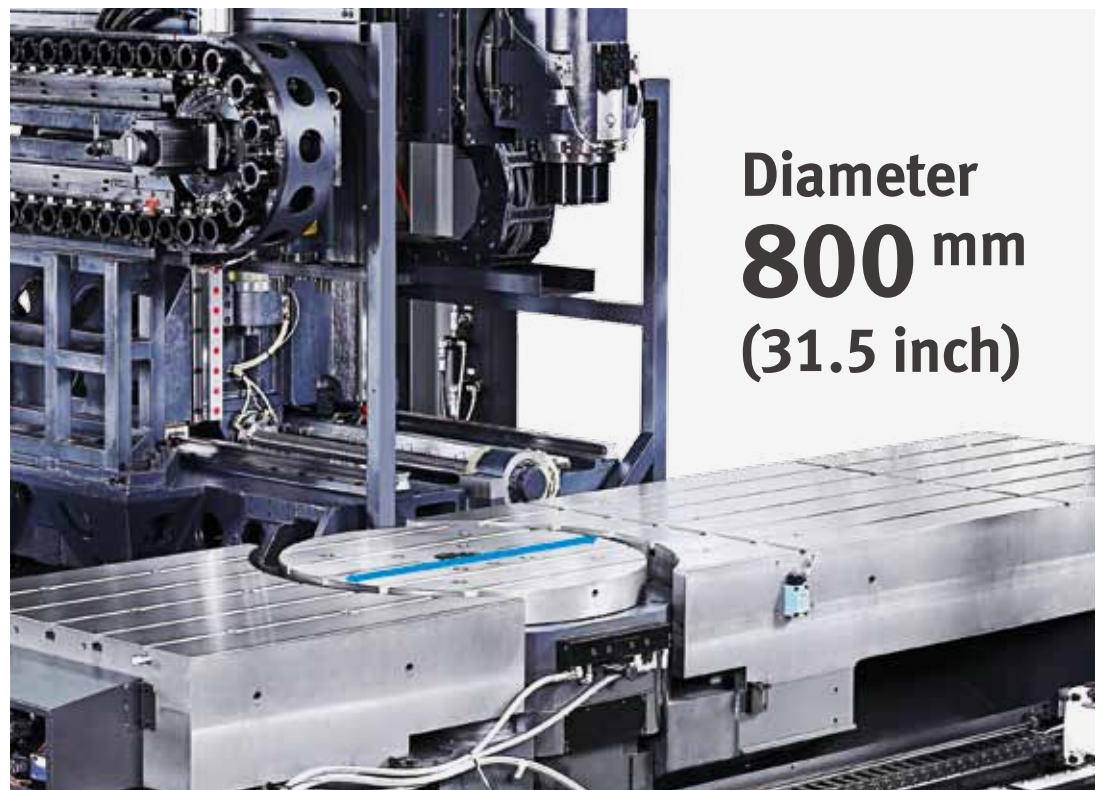
Two types of rotary tables offer the ultimate in customer satisfaction option

Top-mounted attachable / detachable* rotary tables are available in a horizontal or vertical configuration according to the customer's requirements for various types of machining work.



Type	Rotary table diameter mm (inch)	Max. work diameter mm (inch)	Rapid r/min	Load capacity kg (lb)	
				Vertical	Horizontal**
Mounted	ø500 (19.7)	ø730 (28.7)	30	600 (1322.8)	300 (661.4)
				1200 (2645.5)	
Integrated	ø800 (31.5)	ø1050 (41.3)	25		

Offers a competitive edge up to ø1050 of work size in an embedded structure.



* Please consult us about the attachable/detachable configuration.

** For the rotary table only (excluding support).

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Magazine

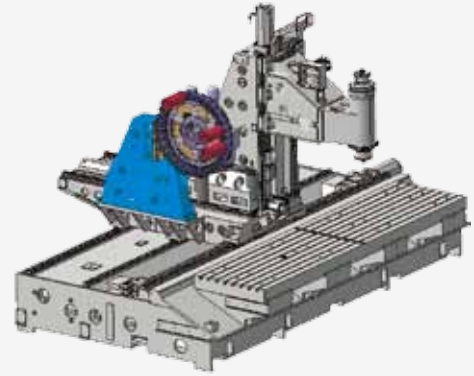
Reliability further improved with the adoption of servo motors. Tool storage capacity can be extended up to 60 tools.

Tool Magazine

High durability and reliability of ATC by adopting a servo motor.

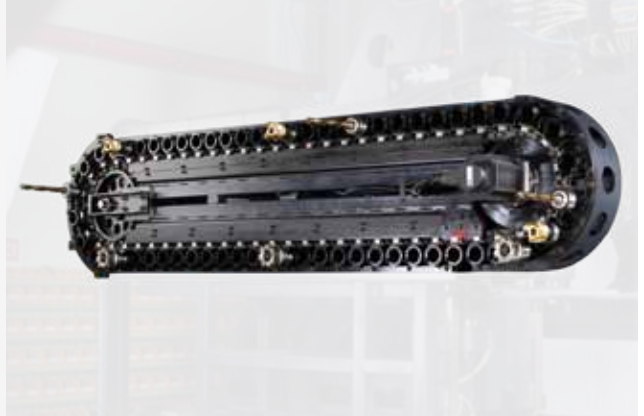
Drum type

30 tools



Chain type option

60 tools



Specifications		Max tool diameter mm (inch)		Max tool length mm (inch)	Max. tool weight kg (lb)
		Continuous	Adjacent pot empty		
Standard	30T	80	130	300 (11.8)	8 (17.6)
Optional	60T	76	130		

Pickup Magazine option

An optional feature for tools with large diameters or lengths.



No. of Tools (ea)	Max tool diameter mm (inch)		Max. tool length mm (inch)	Max. tool weight kg (lb)
	Continuous	Adjacent pot empty		
5	150 (5.9)	230 (9.1)	450 (17.7)	8 (17.6)



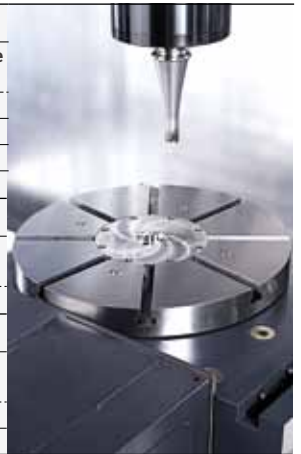
Machining Performance

Multiple-applicable functionality including end milling, face milling, drilling, tapping, etc. offers better machining performance while minimizing work setting.

Machining Performance

VCF 850 / L II

Face mill Carbon steel (SM45C)					
Tool mm (inch)	Spindle Speed r/min	Feed Rate mm/min (ipm)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Chip Removal Rate cm ³ /min (inch)
D80 (D3.1)	1200	3000 (118.1)	64 (2.5)	3.0 (0.1)	576 (35.1)
	1200	2400 (94.5)	64 (2.5)	4.0 (0.2)	614 (37.5)
	1200	1800 (70.9)	64 (2.5)	5.0 (0.2)	576 (35.1)
	1200	1400 (55.1)	64 (2.5)	6.0 (0.2)	538 (32.8)
U-Drill Carbon steel (SM45C)					
Tool mm (inch)	Spindle Speed r/min	Feed Rate mm/min (ipm)	Cutting Depth mm (inch)		
D50 (D2.0)	1080	240 (9.4)	50 (2.0)		
TAP Carbon steel (SM45C)					
Tool mm (inch)	Spindle Speed r/min	Feed Rate mm/min (ipm)	Cutting Depth mm (inch)		
M36 x P4.0 (M1.4 x P0.2)	133	532 (20.9)	45 (1.8)		
M42 x P4.5 (M1.7 x P0.2)	114	513 (20.2)	45 (1.8)		



VCF 850SR / LSR II

Face mill Carbon steel (SM45C)					
Tool mm (inch)	Spindle Speed r/min	Feed Rate mm/min (ipm)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Chip Removal Rate cm ³ /min (inch)
D80 (D3.1)	1500	1500 (59.1)	64 (2.5)	3.5 (0.1)	336 (20.5)
	1500	1500 (59.1)	64 (2.5)	4.0 (0.2)	384 (23.4)
	1500	1500 (59.1)	64 (2.5)	4.5 (0.2)	432 (26.4)
	1500	1500 (59.1)	64 (2.5)	5.0 (0.2)	480 (29.3)
U-Drill Carbon steel (SM45C)					
Tool mm (inch)	Spindle Speed r/min	Feed Rate mm/min (ipm)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Chip Removal Rate cm ³ /min (inch)
D40 (1.6)	2000	1000 (39.4)	40 (1.6)	3.0 (0.1)	120 (7.3)
	2000	1000 (39.4)	40 (1.6)	3.8 (0.1)	152 (9.3)
TAP Carbon steel (SM45C)					
Tool mm (inch)	Spindle Speed r/min	Feed Rate mm/min (ipm)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Chip Removal Rate cm ³ /min (inch)
D12 (0.5)	1600	475 (18.7)	5 (0.2)	10 (0.4)	24 (1.5)

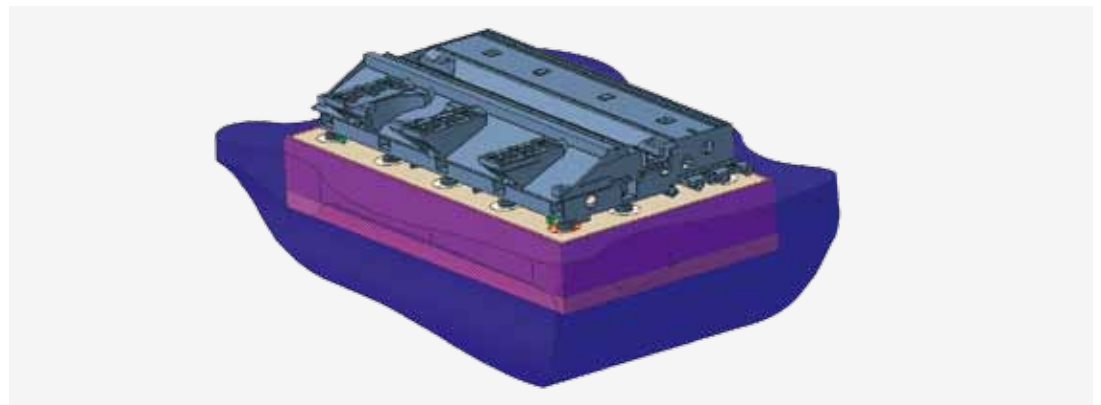


Foundation

Anchoring is recommended to ensure machining accuracy over a long time.

Machine Foundation*

Since machining accuracy is highly dependent on the machine's foundation, anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items.



* Please consult with Doosan sales technicians regarding ground and operating conditions.



Standard / Optional Specifications

Diverse optional features are available for customer-specific requirements.

● Standard ○ Optional X N/A

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NO.	Description	Features	VCF 850 [L] II	VCF 850 SR [LSR] II
1	Tool magazine	30 tools	●	●
2		60 tools	○	○
3	Tool shank type	BIG PLUS BT40	●	●
4		BIG PLUS CAT40	○	○
5		BIG PLUS DIN40	○	○
6		HSK 63A	○	○
7	Auto door lock		●	●
8	Rotary table	Ø500 (mounted)	X	○
9		Ø800 (integrated)	X	○
10	Linear scale	X-axis	○	○
11		Y-axis	○	○
12		Z-axis	○	○
13	Components for installation	Foundation bolt set	●	●
14	Center partition		○	○
15	Spindle	12000 r/min	22/18.5 kW (29.5/24.8 Hp) (FANUC)	●
16			32/24 kW (42.9/32.2 Hp) (HEIDENHAIN)	○
17		18000 r/min*	22/18.5 kW (29.5/24.8 Hp) (FANUC)	○
18			30/24 kW (40.2/32.2 Hp) (HEIDENHAIN)	○
19		Spindle head cooling system		●
20		Thermal error compensation system		●
21	Auto tool measuring device	Swivel head	X	●
22		TS27R_RENISHAW	○	○
23	Auto work measuring device	TT140_HEIDENHAIN	○	○
24		OMP60_RENISHAW	○	○
25		RMP60_RENISHAW	○	○
26	Master tool for auto tool measurement	CALIBRATION BLOCK	○	○
27	Auto power cut-off		○	●
28	Chip bucket		○	○
29	Chip conveyor	Chip pan	●	●
30		Hinged type	○	○
31		Scraper type	○	○
32		Drum type	○	○
33	Coolant	FLOOD (0.9 kW_0.44MPa)	●	●
34		FLUSHING	●	●
35		BED CHIP FLUSHING	●	●
36		Coolant gun	○	○
38	Test bar		○	○
39	Table size	2500 [3500] x 870mm (98.4 [137.8] x 34.3 inch)	●	●
40	Pickup Magazine		○	○
41	AIR	AIR BLOWER	○	○
42		AIR GUN	○	○
43	MPG	Portable MPG	●	●
44	NC Controller	DOOSAN-FANUC i	●	○
45		FANUC 31i-5	X	○
46		HEIDENHAIN TNC 640	○	●
47	OIL SKIMMER	BELT TYPE	○	○
48	RAISED COLUMN		X	X
49	TSC	NONE	●	●
50		1.5 kW_2.0 MPa	○	○
51		3.7 kW_2.0 MPa	○	○
52		5.5 kW_7.0 MPa	○	○
53	SMART THERMAL CONTROL	SENSOR TYPE (ONLY SPINDLE)	○	○
54	Customized Special Option	SERVO AUTO DOOR (w/ SAFETY EDGE)	○	○
55		Long part solution #1	○	○
56		Long part solution #2	○	○
57		Long part solution #3	○	○
58		Add axis preparation #P1	○	○
59		Add axis preparation #P2	○	○
60		Add axis preparation #P3	○	○
61		Air-Oil Lubrication for linear axis	○	○
62		Rotary joint for table	○	○
63		Rotary table with electric rotary joint for magnetic chuck (Dual intergrated type D800 rotary table)	○	○
64	100 tool Magazine		○	○

Peripheral Equipment

Center Partition option 14

Delivers machining efficiency equivalent to two tables, thereby maximizing productivity.

Productivity is maximized by partitioning the table into two working areas.

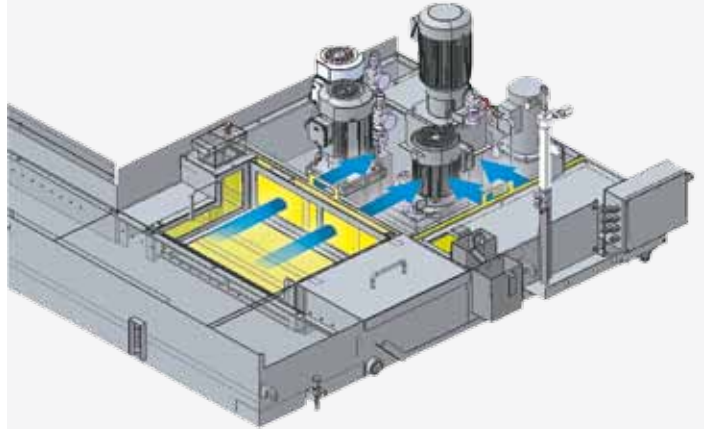


A area
- machining

B area
- loading / unloading work

Coolant tank option

New coolant tank is improved coolant recovery rate and longer filter cleaning cycle.



Intelligent Kinematic Compensation for 5-axis

For high accuracy 5-axis machining, Intelligent Kinematic Compensation function is recommended. This function minimizes error in complex 5-axis machining applications by maintaining tip of the tool in correct position in respect to the workpiece. In order to properly utilize this function, following four optional items are required.



Recommended optional items

1. Software



FANUC NC: DCP-i (Developed by DOOSAN)



Heidenhain NC: Kinematic opt

2. Receiver

Recommended Option



3. Touch Probe

Recommended Option



4. Datum ball

Recommended Option



5. Automatic Tool Measurement

Recommended Option



6. Master Tool

Recommended Option





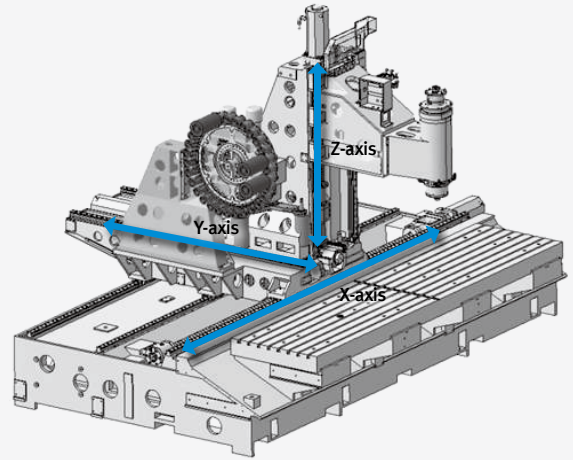
Applications

We offer a wide range of solutions suitable for diverse customer-specific needs.

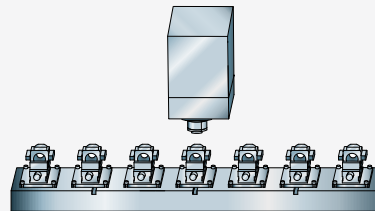
VCF 850 / L II

Various solutions suitable for customer-specific applications support multi-purpose machining to realize high productivity.

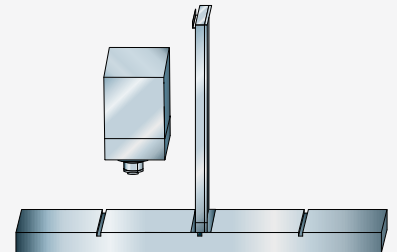
3-axes standard machine



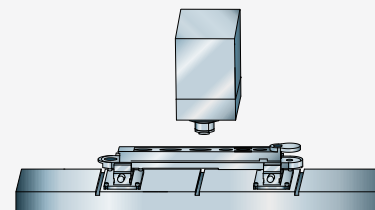
Small items, mass production



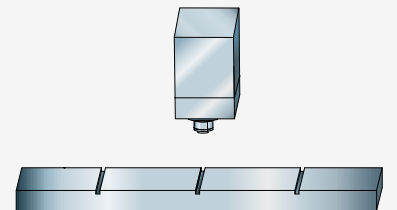
Multi-functional application of table by center partitioning



Long work piece machining as one piece



3-axes standard machining

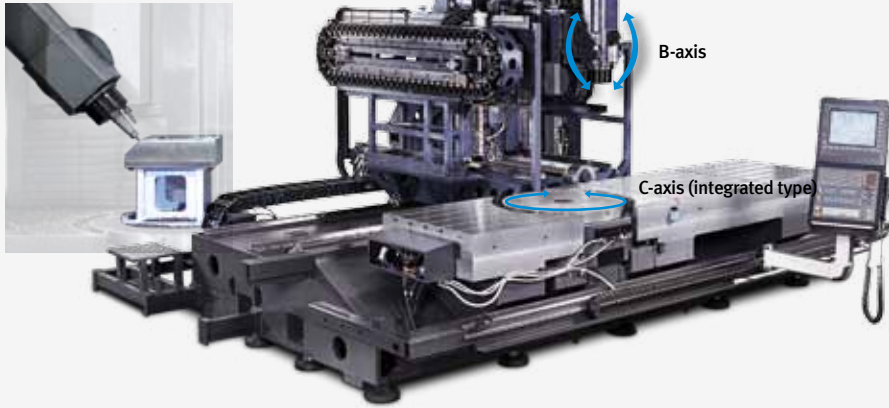


VCF850SR / LSR II

Various solutions suitable for customer-specific applications support multi-purpose machining to realize high productivity.

5 axes machine

- 4 + 1 axes
- 5 axes simultaneously
- X/Y/Z, B/C or X/Y/Z, B/A



Horizontal or vertical type independent

option

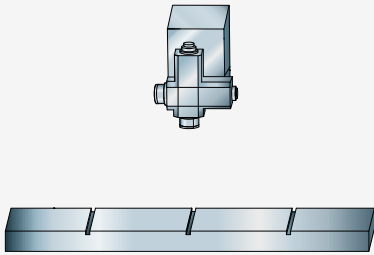


Swivel head

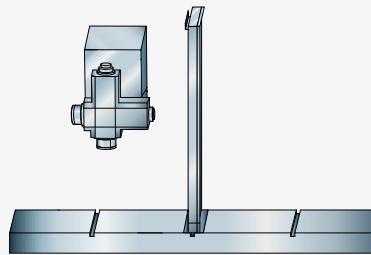
Roller Gear Cam as a standard



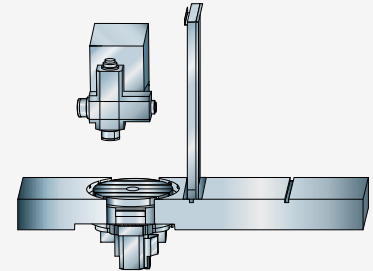
4 axis standard machining



4 axis rear-side divided standard machining

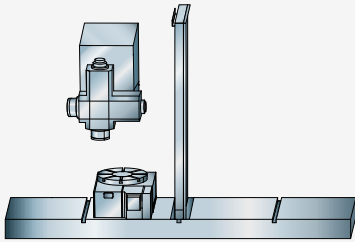


5 axis rear-side divided standard machining (Embedded rotary table)



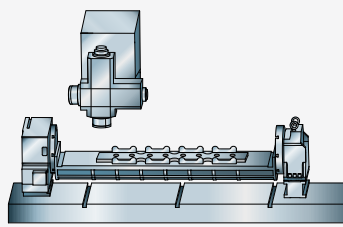
5 axis rear-side divided standard machining (Top-mounted rotary table)

(Top-mounted rotary table)



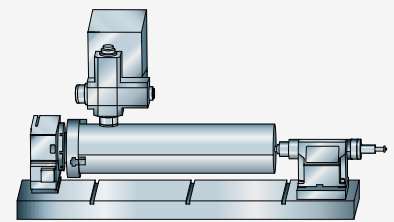
5 axes long workpiece machining (One-setting, continuous machining)

(One-setting, continuous machining)



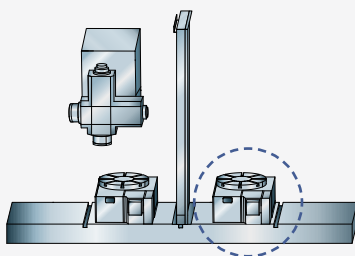
5 axes long workpiece machining (Tilting machining and end support)

(Tilting machining and end support)



5 axis rear-side divided standard machining (Top-mounted rotary table) + additional axis

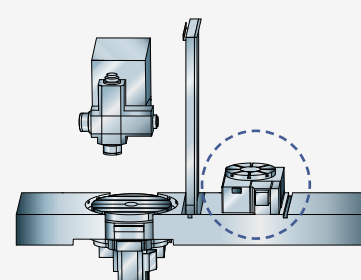
+ additional axis



VCF 850LSR II only

5 axis rear-side divided standard machining (Embedded rotary table) + additional axis

+ additional axis



VCF 850LSR II only

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DOOSAN Fanuc i Plus

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

15 inch screen + New OP

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.



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

iHMI Touch screen option

iHMI provides an intuitive interface that utilizes a touch screen for quick and easy operation and provides a variety of applications that can help machine operation.



• PLANNING

Tool information such as tool offset and tool life can be checked and set, and scheduler function is provided.

• MACHINING

MDI, EDIT, MEM, JOG screen can be changed by using touch function, and it is quick and easy to move to sub menu by using soft key.

• IMPROVEMENT

User can set up to record data for analysis and monitor the specific signals by setting up the maintenance and inspection function. Also user can add items.


• UTILITY

View and search PDF and TEXT files, create notes from text / images / drawings, and link to web pages. For users who are familiar with the DOOSAN Fanuc i Plus screen, the screen can be switched.




Superior Hardware Specifications

15" LCD and capacious 21GB memory



15" LCD



Description	HEIDENHAIN TNC 640	Remarks
Screen size	15" STD	-
Storage memory	21GB STD	-
Interference prevention system	Optional	-
Kinematic OPT.	Optional	Measuring device not included
Look-ahead block	5000 blocks	-
3D line graphics	Std.	-

Convenience

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



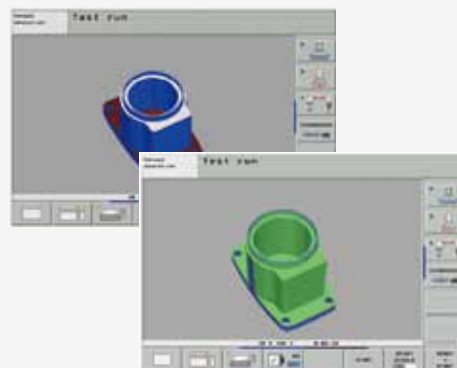
Various built-in pattern cycles for a wider scope of application

Tool length, diameter, and work piece are measured using stored tool measurement graphic cycles.



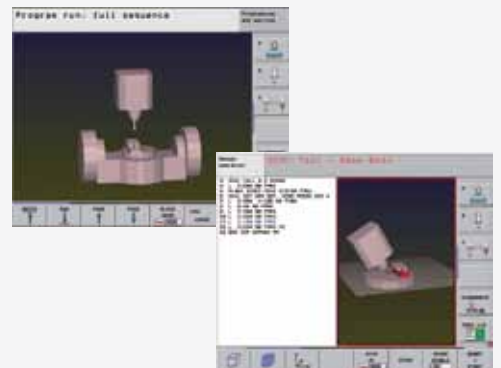
Graphic simulation

Before starting the actual cutting process, a graphic process simulation of the NC program can be carried out using TEST RUN. The cutting time can be estimated.



Collision Protection System option

The motion of the machine can be simulated on a 3D basis to substantially prevent mechanical interference. (Tool length is also recognized.)





SIEMENS 840D

SIEMENS CNC optimized for DOOSAN machine tools maximizes users' productivity.

15.6 inch screen + New OP

The newly-designed operation panel enhances operating convenience by incorporating common-design buttons and layout, and features the Qwerty keyboard for fast and easy operation.



15.6-inch display

- 10MB high capacity user memory
- USB & Ethernet (standard)
- QWERTY Keyboard (standard)
- High speed calculation and simulation can be fulfilled by improved processor skill

Conversational Convenient function

The machining monitoring function developed on the basis of the Shop Mill – an interactive machining support function of SIEMENS – provides users with cutting, servicing and maintenance screens for easy and convenient machine operation.



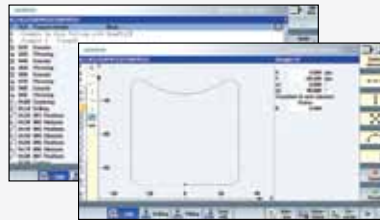
Simulation and machining contour monitoring

Simulation results with different views can be checked.



Smart function

Color highlighting is provided for each processing code function, and the calculator can be used easily by using the pocket calculator on display.



Shop Mill Part Programming

It helps to write the part program and shorten the writing time.



Side screen widget

Through the side widget, operator can easily monitor the current machining status.



5-axis kinematic measuring cycles

This function automatically measures and corrects the rotation axis center, increasing 5-axis machining accuracy.



3D Collision Avoidance_Collision Avoidance ECO

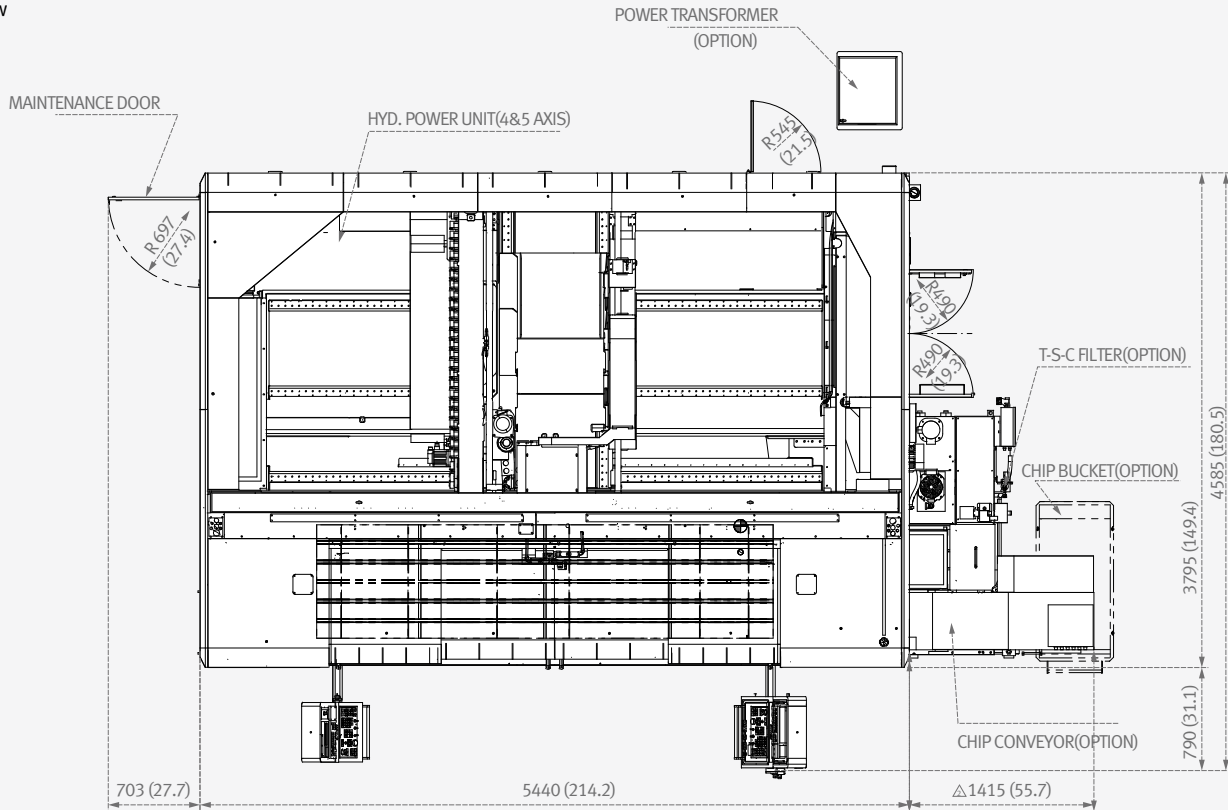
Detect collisions in real time. Detection is possible in all operation modes.

External Dimensions

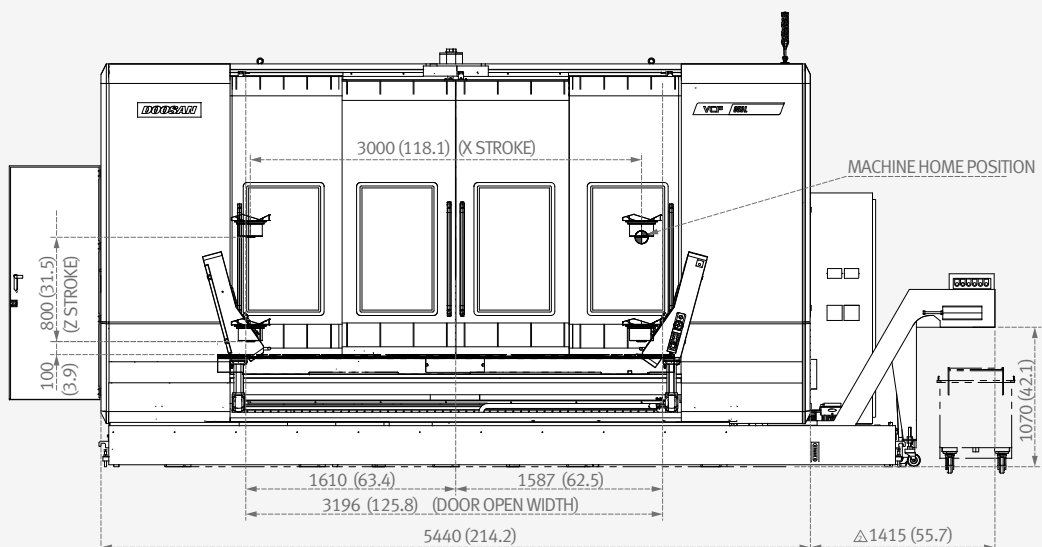
VCF 850LSR II (Right chip conveyor)

Unit: mm (inch)

Top View



Front View



* Some peripheral equipment can be placed in other places

External Dimensions

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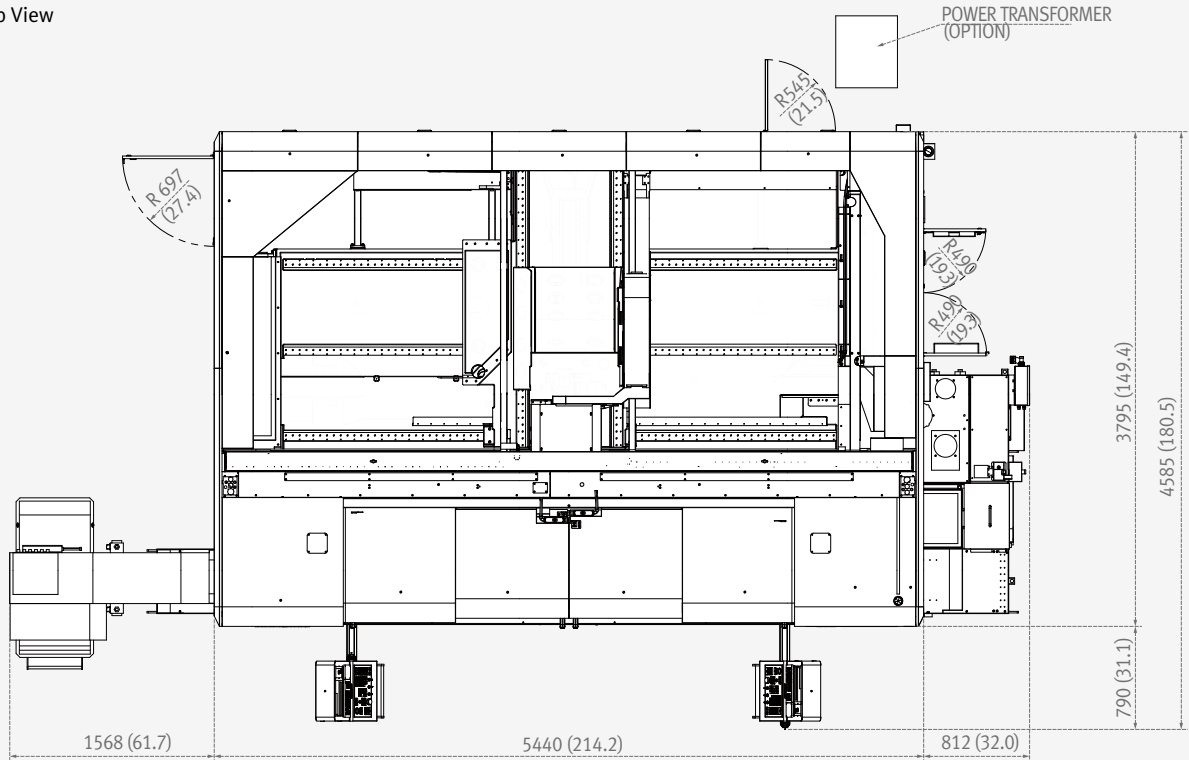
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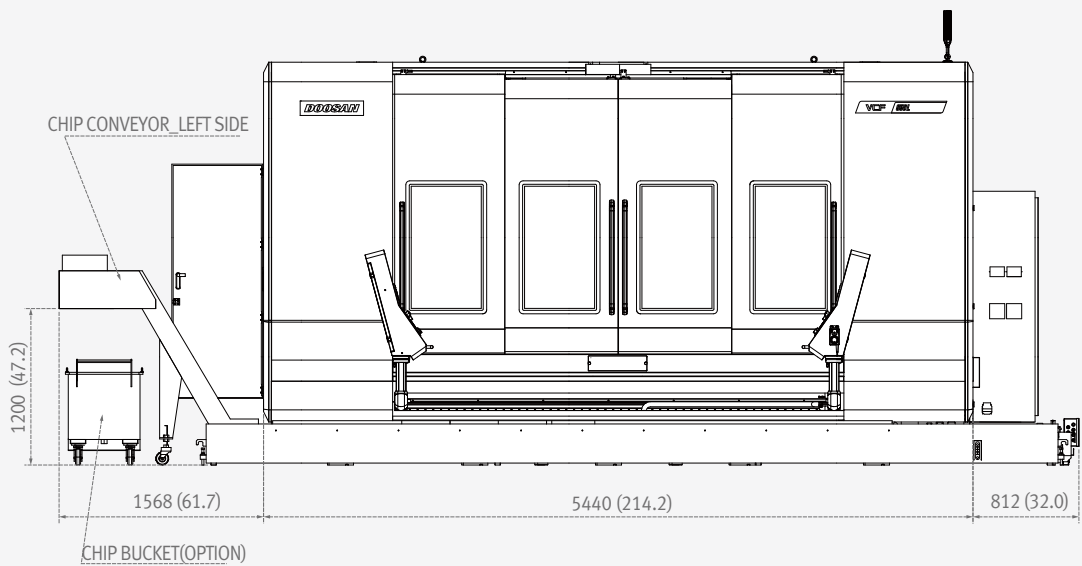
VCF 850LSR II (Left chip conveyor)

Unit: mm (inch)

Top View



Front View

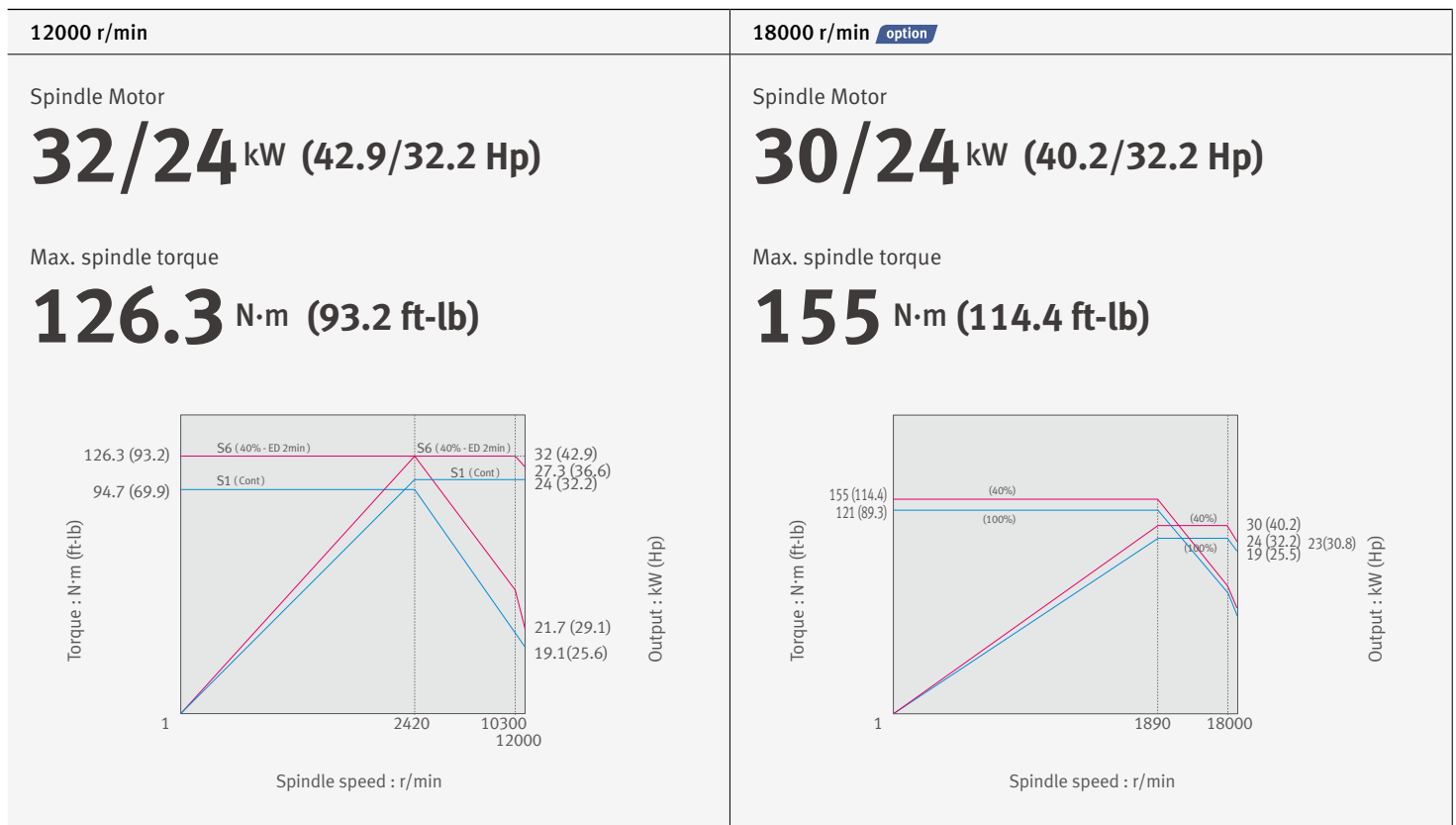


Spindle Power – Torque Curve / Tool Shank

FANUC



HEIDENHAIN



Spindle Power – Torque Curve / Tool Shank

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SIMENS

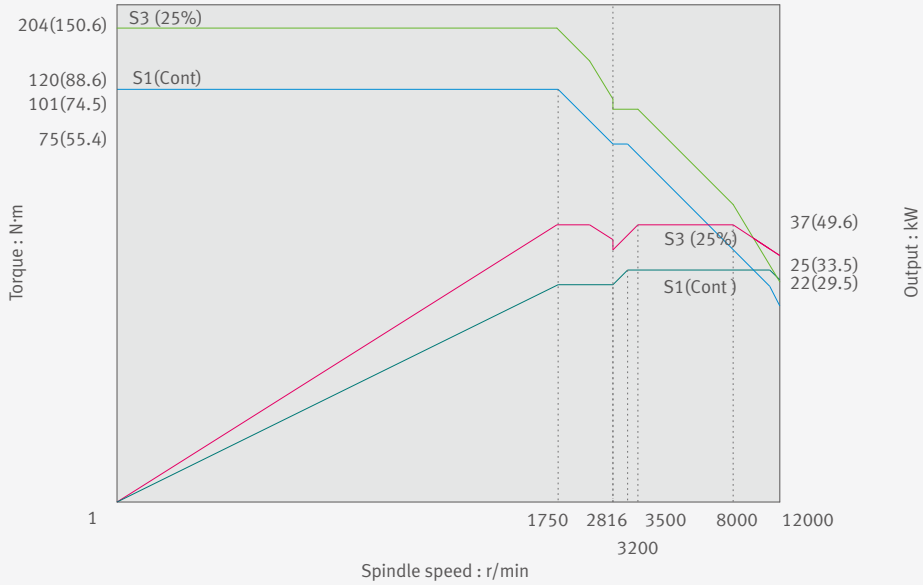
12000 r/min

Spindle Motor

Max. spindle torque

37/22 kW (49.6/29.5 Hp)

204 N·m (150.6 ft-lb)



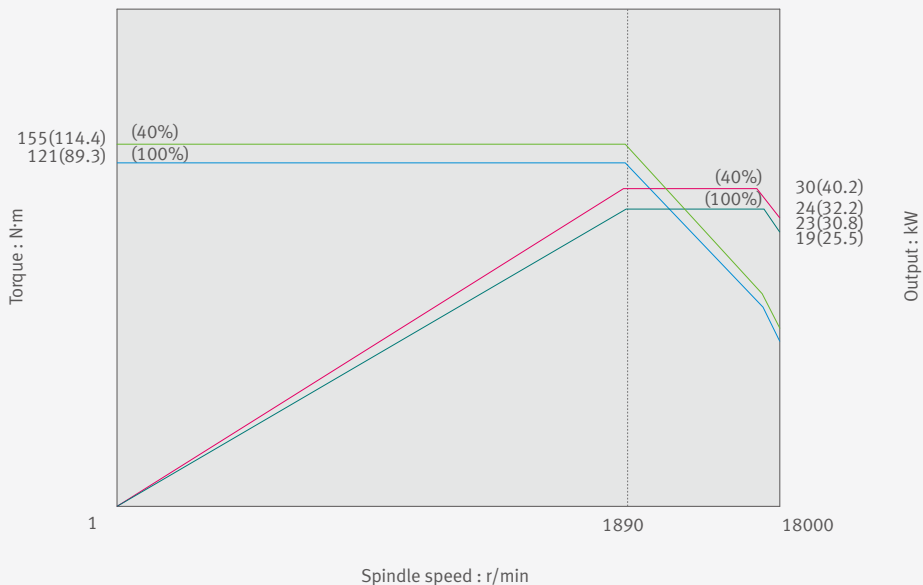
18000 r/min option

Spindle Motor

Max. spindle torque

30/19 kW (40.2/25.5 Hp)

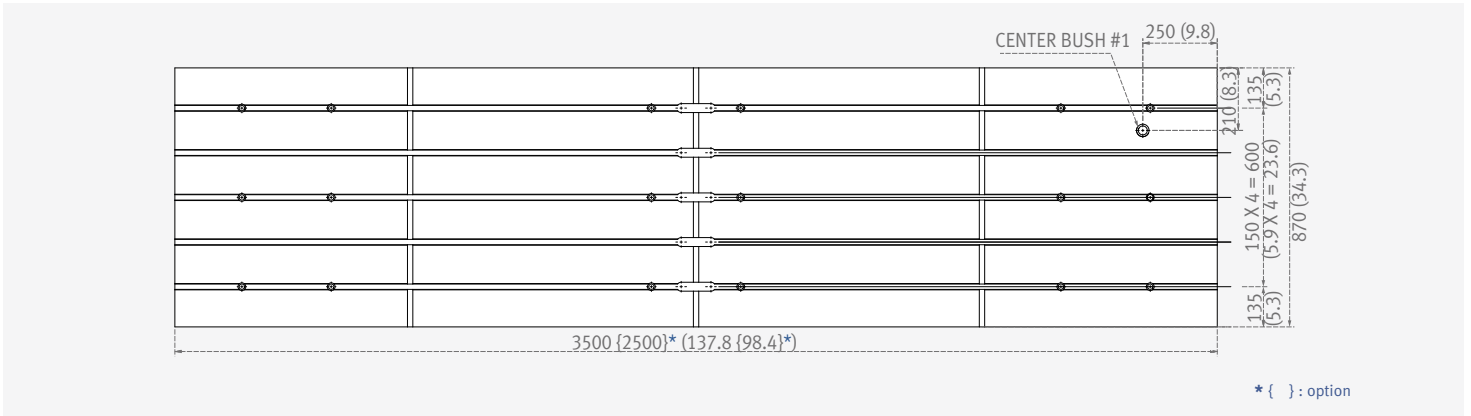
155 N·m (114.4 ft-lb)



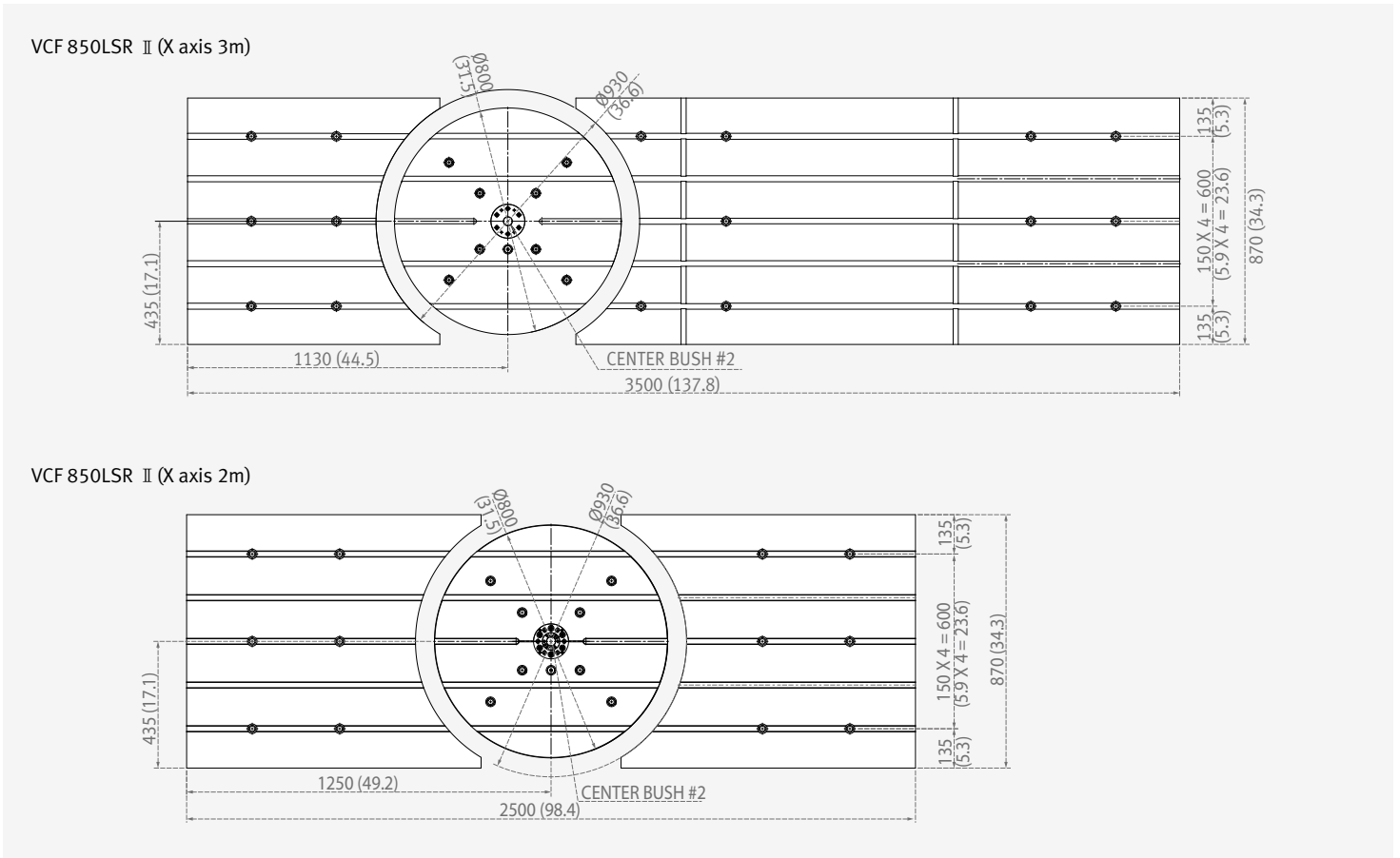
Table

Rigid Table

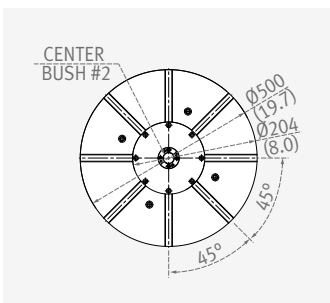
Unit : mm (inch)



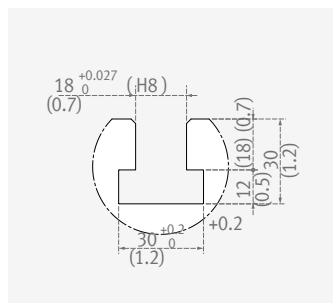
Rigid Table W/D800 Built_in Rotary Table



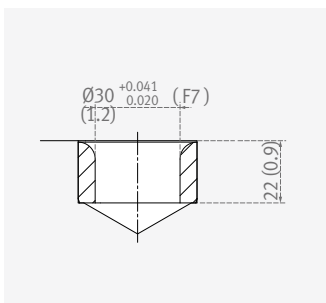
D500 Rotary Table



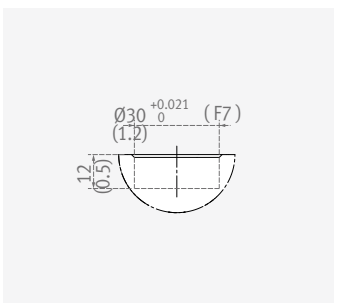
T-slot Detail



Center Bush #1 Detail



Center Bush #2 Detail



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Item		Unit	VCF 850 [L] II	VCF 850SR [LSR] II	
Travels	Travel distance	X-axis	mm (inch)	2000 [3000] (78.7 [118.1])	
		Y-axis	mm (inch)	850 (33.5)	
		Z-axis	mm (inch)	800 (31.5)	
		B-axis	deg	-	220 (+110, -110)
	Distance from spindle center to table top	mm (inch)	100 ~ 900 (3.9 ~ 35.4)	Mounted Rotary Table	Distance between Spindle nose & Table top
			Integrated Rotary Table	Distance between B axis center & Table top	435 ~ 1235 (17.1 ~ 48.6)
				Distance between Spindle nose & Table top	-40 ~ 760 (-1.6 ~ 29.9)
				Distance between B axis center & Table top	295 ~ 1095 (11.6 ~ 43.1)
Feed rate	Rapid traverse rate	X, Y, Z axes	m/min (ipm)	40 (1574.8)	
	Rapid rotating speed	B-axis	r/min	-	50
	Cutting feedrate	X, Y, Z axes	mm/min (ipm)	20000 (787.4)	
		B, C-axis	deg/min	7200	
Table	Table size	mm (inch)	2500 x 870 [3500 x 870] (98.4 x 34.3 [137.8 x 34.3])		
	Loading capacity	kg (lb)	3500 (7716.1)		
	Table type		T-SLOT (5-150 x 18H8)		
Rotary Table			D500	D800	
	Table type		T-SLOT (5-150 x 18H8)		
	Table size	mm (inch)	Ø 500 (Ø 19.7)	Ø 800 (Ø 31.5)	
	Travel distance	deg	-	360	
	Rapid rotating speed	r/min	-	30	25
	Max. work diameter	mm (inch)	-	Ø 730 (Ø 28.7)	Ø 1050 (Ø 41.3)
	Max. work height	mm (inch)	-	490 (19.3) (V), 905 (35.6) (H)	680 (2.9) (V), 1095 (43.1) (H)
	Max. work weight	kg (lb)	-	600 (1322.8) (V), 300 (661.4) (H)	1200 (2645.5)
Spindle	Max. spindle speed	r/min	12000 {18000}*		
	Spindle taper		ISO #40, 7/24 TAPER		
	Max. spindle torque (HEIDENHAIN)	N-m (ft-lb)	126.3 {155}* (93.2 {114.4})		
	Max. spindle torque (FAUNC)	N-m (ft-lb)	204 (150.6) (25 % ED)		
	Max. spindle torque (SIEMENS)	N-m (ft-lb)	126.27 {155}* (93.2 {114.4})		
Automatic Tool Changer	Tool shank type		BT 40 {CAT 40 / DIN / HSK-A63}*		
	Tool storage capacity	ea	30 {60}*		
	Max. tool diameter	Continuous	mm (inch)	80 {76}* (3.1 {3.0})	
		Near port empty	mm (inch)	130 (5.1)	
	Max. tool length	mm (inch)	300 (11.8)		
	Max. tool weight	kg (lb)	8 (17.6)		
	Max. tool moment	N-m (ft-lbs)	5.88 (4.3)		
	Tool selection		RANDOM ADDRESS		
	Tool change time (tool to tool)	s	5.5		
	Tool change time (chip to chip)	s	13		
Motor	Spindle motor power (HEIDENHAIN)	kW (Hp)	32/24 {30/24}* (42.9/32.2 {40.2/32.2})		
	Spindle motor power (FAUNC)	kW (Hp)	22/18.5 {22/18.5}* (29.5/24.8 {29.5/24.8})		
	Spindle motor power (SIEMENS)	kW (Hp)	32/24 (42.9/32.2)		
	Coolant pump motor power	kW (Hp)	0.9 (1.2)		
Power Source	Power consumption (HEIDENHAIN)	kVA	60		
	Power consumption (FANUC)	kVA	54		
	Power consumption (SIEMENS)	kVA	54		
	Compressed air pressure	MPa	0.54		
Tank Capacity	Coolant tank capacity	L (galon)	VCF 850 [SR] II : 520 (137.4)	VCF 850L [LSR] II : 560 (148.0)	
	Lubricant tank capacity	L (galon)	4.3 (1.1)		
Machine Dimensions	Height	mm (inch)	3205 (126.2)		
	Length	mm (inch)	3795 (149.4)		
	Width	mm (inch)	4440 [5440] (174.8 [214.2])		
	Weight		kg (lb)	VCF 850 [SR] II : 22000 (48501.0)	
				VCF 850L [LSR] II : 24000 (52910.2)	
Control	Standard		DOOSAN Fanuc i Plus	HEIDENHAIN TNC 640	
	Option		HEIDENHAIN TNC 640 / SIEMENS S840D	FANUC 31iB5 DOOSAN Fanuc i Plus SIEMENS S840D	

NC Unit Specifications

● Standard ○ Optional X N/A

HEIDENHAIN TNC 640

No.	Division	Item	Spec.	TNC 640
1	Axes	Controlled axes	3 axes	X
2			4 axes	X
3			5 axes	X, Y, Z, B, (5)
4		Additional controlled axes	6 axes	○
5		Simultaneously controlled axes	Controlled axes	●
6		Controlled axes	Max. 18 axes in total	○ (Max. 18 axes)
7		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	●
8		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	●
9		Maximum commandable value	+99999.999mm (±3937 inch)	●
10		Axis feedback control	Double-speed control loops for high-frequency spindles and torque/linear motors	○
11		MDI / DISPLAY unit	15.1 inch TFT color flat panel	●
12			19 inch TFT color flat panel	○
13		Program memory for NC programs	SSDR	21GB
14		Block processing time		0.5 ms
15		Cycle time for path interpolation	CC 61xx	3 ms
16		Encoders	Absolute encoders	EnDat 2.2
17	Interpolation	Straight line		5 AXES
18		Circle		3 axes
19		Helix, Combination of circular and linear motion		●
20		Spline interpolation		●
21	Configuration	Machine parameters	Numerical structure	X
22			Tree structure with symbolic names of the parameters	●
23			Tabular representation	X
24	Commissioning and diagnostics	Integrated oscilloscope		●
25		OnLine monitor (OLM)		●
26		BUS diagnostics		●
27		DriveDiag		●
28		ApiData function		●
29		Trace function		●
30		Table function		●
31		Logic diagram		●
32		I/O-Force List		●
33		Log		●
34		Machine operating panel	TE 735	●
35			TE 745	○
36		Electronic handwheels	HR 410	●
37		Data interfaces	Ethernet interface	●
38	USB interface (USB 2.0)		●	
39	Feedrate override	0 - 150 % (10% unit)	●	
40	Spindle orientation		●	
41	Spindle speed command	S5 digits	●	
42	Spindle speed override	0 - 150 %	●	
43	Monitoring functions	Position monitoring	●	
44		Movement monitoring	●	
45		Standstill monitoring	●	
46		Positioning window	●	
47		Temperature monitoring	●	
48		Amplitude of encoder signals	●	
49		Edge separation of encoder signals	●	
50		Nominal speed value	●	
51		Buffer battery	●	
52		Machine functions	Monitoring functions	●
53	Run-time of PLC program		●	
54	Emergency-stop monitoring		●	
55	Internal power supply and housing fan		●	
56	Gantry axes and master-slave torque control		●	
57	Look-ahead(Intelligent path control by calculating the path speed ahead of time)		Max. 1024 blocks. Max. 5000 blocks.	X
58	ADP (Advanced Dynamic Prediction)			●
59	HSC filters			●
60	Switching the traverse ranges			●
61	C-axis operation	Spindle motor drives the rotary axis	●	
62	User functions	Program input	According to ISO	●
63			With smarT.NC	X
64			With smartSelect	●
65		Position entry	Nominal positions for lines and arcs in Cartesian coordinates	●
66			Incremental or absolute dimensions	●
67			Display and entry in mm or inches	●
68			Display of the handwheel path during machining with handwheel superimpositioning	●
69		Paraxial positioning blocks		●
70		Tool compensation	In the working plane and tool length	●
71			Radius-compensated contour look-ahead for up to 99 blocks (M120)	●
72			Three-dimensional tool radius compensation	●
73		Tool table	Central storage of tool data	●
74			Multiple tool tables with any number of tools	●
75		Cutting-data table	Calculation of spindle speed and feed rate based on stored tables	X

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HEIDENHAIN TNC 640

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No.	Division	Item	Spec.	TNC 640	
76	User functions	Cutting data calculator	Calculation of spindle speed and relative to the path of the tool center or to the tool's cutting edge	●	
77		Constant contouring speed	Creation of a program while another program is being run	●	
78		Parallel operation		●	
79		MDI mode		●	
80		Tilting the working plane with Cycle 19		●	
81		Tilting the working plane with the PLANE function		●	
82		Manual traverse in tool-axis direction	after interruption of program run	●	
83		Function TCPM	Retaining the position of tool tip when positioning tilting axes	●	
84		Rotary table machining	Programming of cylindrical contours as if in two axes	●	
85			Feed rate in distance per minute	●	
86		FK free contour programming	for workpieces not dimensioned for NC programming	●	
87		Program jumps	Subprograms and program section repeats	●	
88			Calling any program as a subprogram	●	
89		New 3-D simulation graphics in full detail		●	
90		Program verification graphics	Plan view, view in three planes, 3-D view	●	
91			3-D line graphics	●	
92		Programming graphics	2-D line graphics	●	
93			3-D line graphics	X	
94		Program-run graphics	(plan view, view in three planes, 3-D view)	●	
95		Datum tables	Saving of workpiece-specific datums	●	
96		Preset table	Saving of reference points	●	
97		Freely definable table	after interruption of program run	●	
98			With mid-program startup	●	
99		Returning to the contour	After program interruption (with the GOTO key)	●	
100		Autostart		●	
101		Actual position capture		●	
102		Enhanced file management		●	
103		Context-sensitive help for error messages		●	
104		TNCguide	Browser-based, context-sensitive helpsystem	●	
105		Calculator		●	
106		Entry of text and special characters		●	
107		Comment blocks in NC program		●	
108		"Save As" function		●	
109		Structure blocks in NC program		●	
110		Entry of feed rates	FU (feed per revolution)	●	
111			FZ (tooth feed per revolution)	●	
112			FT (time in seconds for path)	X	
113			FMAXT (only for rapid traverse pot: time in seconds for path)	X	
114		Dynamic collision monitoring (DCM)		○ (850 II / 850L II) ● (850SR II / 850LSR II)	
115		Fixture monitoring		X	
116		Processing DXF data		○	
117		Global program settings (GS)		X	
118		Adaptive feed control (AFC)		○	
119		KinematicsOpt	Automatic measurement and optimization of machine kinematics	○ (850 II / 850L II) ● (850SR II / 850LSR II)	
120		KinematicsComp	Three-dimensional compensation	○	
121		3D-ToolComp	Dynamic 3-D tool radius compensation	○	
122		FUNCTION MODE TURN	Switchover to turning mode	○	
123		FUNCTION MODE MILL	Switchover to milling mode	○	
124		TOOLTURNTURN	Tool table for turning tools	○	
125		Tool compensation for turning		○	
126		FUNCTION TURNDATA SPIN VCONST ON VC:253	Constant surface speed with optional spindle speed limiting	○	
127		FUNCTION TURNDATA BLANK	Blank-form update during turning	○	
128		GRV AXIAL, GRV RADIAL	Undercut as contour element	○	
129		UDC TYPE	Recess as contour element, types E, F, H, K, U, threads	○	
130		Imbalance monitoring	Cycles for determining and monitoring imbalance	○	
131		Fixed cycles	Pecking	Cycle 1	●
132			Tapping	Cycle 2	●
133			Slot milling	Cycle 3	●
134			Pocket milling	Cycle 4	●
135			Circular pocket	Cycle 5	●
136			Rough-out (old SL I cycles)	Cycle 6	X
137			Datum shift	Cycle 7	●
138			Mirror imaging	Cycle 8	●
139			Dwell time	Cycle 9	●
140			Rotation	Cycle 10	●
141			Scaling factor	Cycle 11	●
142			Program call	Cycle 12	●
143			Oriented spindle stop	Cycle 13	●
144			Contour definition	Cycle 14	●
145			Pilot drilling (old SL I cycles)	Cycle 15	X
146			Contour milling (old SL I cycles)	Cycle 16	X
147			Rigid tapping (controlled spindle)	Cycle 17	●
148			Thread cutting	Cycle 18	●
149			Working plane	Cycle 19	●
150			Contour data	Cycle 20	●

No.	Division	Item	Spec.	TNC 640		
151	Fixed cycles	Pilot drilling	Cycle 21	●		
152		Rough-out	Cycle 22	●		
153		Floor finishing	Cycle 23	●		
154		Side finishing	Cycle 24	●		
155		Contour train	Cycle 25	●		
156		Axis-specific scaling	Cycle 26	●		
157		Cylinder surface	Cycle 27	●		
158		Cylinder surface slot milling	Cycle 28	●		
159		Cylinder surface ridge milling	Cycle 29	●		
160		Cylinder surface outside contour milling	Cycle 39	●		
161		Run 3-D data	Cycle 30	X		
162		Tolerance (HSC mode, TA)	Cycle 32	●		
163		Drilling	Cycle 200	●		
164		Reaming	Cycle 201	●		
165		Boring	Cycle 202	●		
166		Universal drilling	Cycle 203	●		
167		Back boring	Cycle 204	●		
168		Universal pecking	Cycle 205	●		
169		Tapping with floating tap holder	Cycle 206	●		
170		Rigid tapping, new	Cycle 207	●		
171		Bore milling	Cycle 208	●		
172		Tapping with chip breaking	Cycle 209	●		
173		Slot with reciprocating plunge	Cycle 210	●		
174		Circular slot	Cycle 211	●		
175		Rectangular pocket finishing	Cycle 212	●		
176		Rectangular stud finishing	Cycle 213	●		
177		Circular pocket finishing	Cycle 214	●		
178		Circular stud finishing	Cycle 215	●		
179		Polar pattern	Cycle 220	●		
180		Cartesian pattern	Cycle 221	●		
181		Engraving	Cycle 225	●		
182		Multipass milling	Cycle 230	●		
183		Ruled surface	Cycle 231	●		
184		Face milling	Cycle 232	●		
185		Face milling	Cycle 233 Enhanced with side walls, milling direction and strategy	●		
186		Centering	Cycle 240	●		
187		Single-lip deep-hole drilling	Cycle 241	●		
188		Datum setting	Cycle 247	●		
189		Rectangular pocket, complete	Cycle 251	●		
190		Circular pocket, complete	Cycle 252	●		
191		Slot, complete	Cycle 253	●		
192		Circular slot, complete	Cycle 254	●		
193		Rectangular stud, complete	Cycle 256	●		
194		Circular stud, complete	Cycle 257	●		
195		Thread milling	Cycle 262	●		
196		Thread milling/countersinking	Cycle 263	●		
197		Thread drilling/milling	Cycle 264	●		
198		Helical thread drilling/milling	Cycle 265	●		
199		Outside thread milling	Cycle 267	●		
200		Contour train data	Cycle 270	●		
201		Trochoidal milling	Cycle 275	●		
202		Three-D contour train	Cycle 276	X		
203		Interpolation turning (option 96)	Cycle 290 (TNC640, cycle 291/292, Option 96)	●		
204		Touch probe cycles	Calibrating the effective radius on a circular stud	●		
205			Calibrating the effective radius on a sphere	●		
206			Calibrate TS	X		
207		Cycles for automatic workpiece inspection	Calibrate TS length	X		
208			Measure axis shift	X		
209			Save kinematics	●		
210			Measure kinematics	●		
211			Preset compensation	●		
212			TS calibration of length	●		
213			TS calibration in a ring	●		
214			TS calibration on stud	●		
215		Options	Software option 1	Rotary table machining	●	
216				Feed rate in mm/min		
217				Coordinate transformation		
218			Interpolation	Circular in 3 axes with tilted working plane		
219			Software option 2	3-D machining	3-D tool compensation through surface normal vectors	●
220					Tool center point management (TCPM)	
221					Keeping the tool normal to the contour	
222					Tool radius compensation normal to the tool direction	
223			Interpolation	Line in 5 axes (subject to export permit)		
224				Spline: execution of splines (3rd degree polynomial)		
225		Python OEM Process	Execute Python applications	○		

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● Standard ○ Optional X N/A

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No.	Division	Item	Spec.	DOOSAN Fanuc i Plus	FANUC 31iB5	
1	CONTROLLED AXIS	Controlled axes	3 (X, Y, Z)	X, Y, Z, B, (5)	X, Y, Z, B, (5)	
2		Additional controlled axes	5 axes in total	STD.	STD.	
3		Least command increment	0.001 mm / 0.0001"	●	●	
4		Least input increment	0.001 mm / 0.0001"	●	●	
5		Interpolation type pitch error compensation		●	○	
6	INTERPOLATION & FEED FUNCTION	2nd reference point return	G30	●	●	
7		3rd / 4th reference return		●	●	
8		Inverse time feed		●	○	
9		Cylindrical interpolation	G07.1	●	○	
10		Helical interpolation B	Only Fanuc 30i	●	●	
11		Smooth interpolation		X	○	
12		NURBS interpolation		X	○	
13		Involute interpolation		X	○	
14		Helical involute interpolation		X	○	
15		Bell-type acceleration/deceleration before look ahead interpolation		●	●	
16		Smooth backlash compensation		●	●	
17		Automatic corner override	G62	●	○	
18		Manual handle feed	Max. 3unit	1 unit	1 unit	
19		Manual handle feed rate	x1, x10, x100 (per pulse)	●	●	
20		Handle interruption		●	○	
21		Manual handle retrace		○	○	
22		Manual handle feed 2/3 unit		X	○	
23		Nano smoothing	AI contour control II is required.	X	●	
24		AI APC	20 BLOCK	X	X	
25		AICC I	30 BLOCK	X	X	
26		AICC I	40 BLOCK	X	X	
27		AICC II	200 BLOCK	●	●	
28		AICC II	400 BLOCK	○*1)	○	
29		High-speed processing	600 BLOCK	X	○	
30		Look-ahead blocks expansion	1000 BLOCK	X	○	
31		DSQ I	AICC II (200block) + Machining condition selection function	X	●	
32		DSQ II	AICC II (200block) + Machining condition selection function + Data server(1GB)	X	○	
33		DSQ III	AICC II with high speed processing (600block) + Machining condition selection function + Data server(1GB)	X	○	
34		SPINDLE & M-CODE FUNCTION	M- code function		●	●
35			Retraction for rigid tapping		●	●
36			Rigid tapping	G84, G74	●	●
37		TOOL FUNCTION	Number of tool offsets	64 ea	X	64 ea
38			Number of tool offsets	99 ea	X	○
31	Number of tool offsets		200 ea	X	○	
32	Number of tool offsets		400 ea	400 ea	○	
33	Number of tool offsets		499 / 999 / 2000 ea	X	○	
34	Tool nose radius compensation		G40, G41, G42	●	●	
35	Tool length compensation		G43, G44, G49	●	●	
36	Tool life management			●	●	
37	Addition of tool pairs for tool life management			●	○	
38	Tool offset		G45 - G48	●	●	

● Standard ○ Optional X N/A

No.	Division	Item	Spec.	DOOSAN Fanuc iPlus	FANUC 31iB5
39	PROGRAMMING & EDITING FUNCTION	Custom macro		○	●
40		Macro executor		●	●
41		Extended part program editing		●	●
42		Part program storage	256KB(640m)	X	640m
43		Part program storage	512KB(1,280m)	X	○
44		Part program storage	1MB(2,560m)	X	○
45		Part program storage	2MB(5,120m)	5120 m	○
46		Part program storage	4MB(1,0240m)	X	○
47		Part program storage	8MB(2,0480m)	X	○
48		Inch/metric conversion	G20 / G21	●	●
49		Number of Registered programs	400 ea	X	X
50		Number of Registered programs	500 ea	X	500 ea
51		Number of Registered programs	1000 ea	1000 ea	○
52		Number of Registered programs	4000 ea	X	○
53		Optional block skip	9 BLOCK	●	○
54		Optional stop	M01	●	●
55		Program file name	32 characters	●	●
56		Program number	04-digits	X	X
57		Playback function		●	○
58		Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs	48 pairs
59	Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	○	○	
60	OTHERS FUNCTIONS (Operation, setting & Display, etc)	Embedded Ethernet		●	●
61		Graphic display	Tool path drawing	●	●
62		Loadmeter display		●	●
63		Memory card interface		●	●
64		USB memory interface	Only Data Read & Write	●	●
65		Operation history display		●	●
66		DNC operation with memory card		●	●
67		Optional angle chamfering / corner R		●	●
68		Run hour and part number display		●	●
69		High speed skip function		●	○
70		Polar coordinate command	G15 / G16	●	○
71		Polar coordinate interpolation	G12.1 / G13.1	X	○
72		Programmable mirror image	G50.1 / G51.1	●	○
73		Scaling	G50, G51	●	○
74		Single direction positioning	G60	●	○
75		Pattern data input		●	○
76		Jerk control	AI contour control II is required.	●	○
77		Fast Data server with 1GB PCMCIA card		○	○
78		Fast Ethernet		○	○
79		3-dimensional coordinate conversion		●	●
80	3-dimensional tool compensation		X	○	
81	Figure copying	G72.1, G72.2	○	○	
82	Machining time stamp function		○	○	
83	Machine alarm diagnosis		●	X	
84	CNC screen display		●	●	
85	CNC screen dual display function		●	●	
86	One touch macro call		●	○	
87	Machining quality level adjustment		●	○	
88	EZ Guide i (Conversational Programming Solution)		● *2)	○	
89	iHMI with Machining Cycle		○ *3)	X	
90	MANUAL GUIDE i		X	○	

*1) AI CC2 (400block) of OiMF must be changed to High Speed Main board. Ask R&D center for information

*2) Only with 15" LCD standard *3) Only with 15" Touch LCD standard



Basic Information

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Customer Support Service

No.	ITEM	Spec.	S840D		
			VCF850 /L II	VCF850SR/ LSR II	
1	Controlled axes	3 axes			
2		4 axes	X	X	
3		5 axes	X, Y, Z	X, Y, Z	
4	Additional controlled axes	Max. 31 axes in total(S840Ds) /Max. 5 axes in total(S828D)	○	○	
8	Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) :5 axes Circular interpolation(G02, G03) : 2 axes	●	●	
9	Axes control	Backlash compensation	●	●	
10		Leadscrew error compensation	●	●	
11		Measuring system error compensation	●	●	
12		Feedforward control	velocity-dependent	●	●
13		Follow up mode		●	●
14		Programmable acceleration		●	●
15		Emergency stop / overtravel		●	●
17		Least input increment	0.001mm (0.0001 inch)	●	●
18			0.0001mm (0.0001 inch)	●	●
19		Maximum commandable value	±99999.999mm (±3937 inch)	●	●
20	Machine lock (PRT)	All axes	●	●	
21	Position switching signals/cam controller		●	●	
22	Absolute encoder		○	○	
23	Travel to fixed stop with Force Control		●	●	
24	Dry run		●	●	
25	Feedrate/Rapid override	0 - 120 %	●	●	
26	Reference point return	G75 FP=1	●	●	
27	2nd reference point return	G75 FP=2	●	●	
28	3rd / 4th reference return	G75 FP=3, 4	●	●	
29	Advanced surface		●	●	
30	Top surface		○	○	
31	Linear interpolation	Max. 4	●	●	
32	Circular interpolation	G02, G03	●	●	
33	Inverse time feedrate	G93	●	●	
34	Helical interpolation		●	●	
35	Universal interpolator NURBS		●	●	
36	Polynomial interpolation		○	○	
37	Spline interpolation (A, B and C splines)		●	●	
38	Involute interpolation		○	○	
39	Dwell	G04	●	●	
40	Separate path feed for corners and chamfers		●	●	
41	Reposition		●	●	
42	Acceleration with Jerk limitation		●	●	
43	Compressor for 3-axis machining		●	●	
44	Compressor for 5-axis machining		●	●	
45	Temperature compensation		●	●	
46	Positioning	G00	●	●	
47		S/W version 4.5	150	150	
48	Look ahead number of block	S/W version 4.7	1000	1000	
49		S/W version 4.8	1000	1000	
50	Cartesian point-to-point (PTP) travel		●	●	
51	TRANSMIT/cylinder surface transformation		●	●	
53	Inclined axis TRAANG after TRANSMIT/TRACYL		●	●	
54	Spindle speed, digital setpoint		●	●	
55	Spindle speed, max. programmable value range	106 ... 0.0001 (display: ± 999999999.9999)	●	●	
56	Spindle override	50 - 120 %	●	●	
57	Spindle & M code function	Automatic gear state selection	●	●	
58		Oriented spindle stop	●	●	
59		Spindle speed limitation min./max.	●	●	
60		Constant cutting rate	●	●	
61		Spindle control via PLC (Positioning, oscillation)	●	●	
62		Changeover to axis mode	●	●	
63		Tapping with compensating chuck/rigid tapping	●	●	
64		Tool radius compensations in plane		●	●
65		• With approach and retract strategies		●	●
66		• With transition circle/ellipse on outer edges		●	●
67	3D Tool radius compensation		○	○	
69	Number of tools/cutting edges in tool list	600/1500	●	●	
70	Tool length compensation		●	●	
71	Tool function	Operation with tool management	●	●	
72		Tool list	●	●	
73		Tool offset selection via T and D numbers	●	●	
74		Replacement tools for tool management	●	●	
75		Monitoring of tool life and workpiece count	●	●	
76		Manual measurement of tool offset	●	●	
77		Magazine list	●	●	
78		Loading and unloading of tools	●	●	
79		Programming language (DIN 66025 and high-level language expansion)	●	●	
80		Main program call from main program and subprogram	●	●	
81	Subprogram levels and interrupt routines, max.		16/2	16/2	
82	Number of subprogram passes (≤ 9999)		8	8	
83	Number of levels for skip blocks		8	8	
84	Polar coordinates		●	●	
85	1 / 2 / 3-point contours		●	●	
86	Dimensions metric /inch, changeover manually or via program		●	●	
87	Auxiliary function output		●	●	
88	• Via M word, max. programmable value range: INT 2 ³¹ -1		●	●	
89	• Via H word, max. range: REAL ± 3.4028 ex 38, INT -2 ³¹ ... 2 ³¹ -1		●	●	
90	CNC High-level language with		●	●	
91	• User variables, configurable		●	●	
92	• Read/write system variables		●	●	
93	• Indirect programming		●	●	
94	• Program jumps and branches		●	●	
95	• Program coordination with WAIT, START, INIT		●	●	
96	• Arithmetic and trigonometric functions		●	●	
97	• Compare operations and logic combinations		●	●	
98	• Macro techniques		●	●	
99	• Control structures IF-ELSE-ENDIF		●	●	
100	• Control structures WHILE, FOR, REPEAT, LOOP		●	●	
101	• STRING functions		●	●	
102	Program functions		●	●	
103	• Dynamic preprocessing memory FIFO		●	●	
104	• Frame concept		●	●	
105	• Inclined-surface machining with swivel cycle		●	●	
106	• Axis/spindle replacement		●	●	
107	• Geometry axes, switchable online in the CNC program		●	●	
108	• Program preprocessing		●	●	
109	Online ISO dialect interpreter		●	●	

● Standard ○ Optional X Not applicable

No.	ITEM	Spec.	S840D	
			VCF850 /L II	VCF850SR /LSR II
110	Program/workpiece management			
111	• Parts programs on (PPU or NCU), max. number		1000	1000
112	• Workpieces on (PPU or NCU), max. number		250	250
113	• Workpieces on Hard disk, max. number		○	○
114	• In additional HMI user memory on CF card		●	●
115	• On integral Hard disk PCU50.5		○	○
116	• On USB storage medium (e.g. disk drive, USB stick)		●	●
117	• On network drive		●	●
118	• Templates for workpieces, programs and INI files		●	●
119	• Job lists		●	●
120	Basic frames, max. number		16	16
121	Settable offsets, max. number	G54, G55, G56 ...	100	100
122	Zero/work offsets, programmable (frames)		●	●
123	Scratching, determining zero/work offset		●	●
124	Work offsets, external via PLC		●	●
125	Global and local user data		●	●
126	Global program user data		●	●
127	Display system variables		○	○
137	Program editor			
138	• Programming support for cycles program(Program Guide)		●	●
139	• Dual editor		●	●
140	• CNC editor with editing functions: Marking, copying, deleting		●	●
141	• Programming graphics/free contour input (contour calculator)		●	●
142	• Screens for 1/2/3-point contours (contour definition programming)		●	●
143	• Support for parameter input Animated Elements		●	●
144	• Shopturn/ShopMill Machining step programming		●	●
145	Technology cycles for drilling/milling		●	●
146	Pocket milling free contour and islands stock removal cycle		●	●
148	Residual material detection		●	●
149	Access protection for cycles		○	○
150	Programming support can be extended, e.g. customer cycles		●	●
151	Quick view for mold making program		●	●
152	2D simulation		●	●
153	3D simulation, finished part		●	●
154	Simultaneous recording		●	●
155	Measure kinematics		●	●
156	DXF Reader for PC integrated in SINUMERIK Operate		○	○
157	JOG			
158	• Handwheel selection		●	●
159	• Switchover: inch/metric		●	●
160	• Manual measurement of zero/work offset		●	●
161	• Manual measurement of tool offset		●	●
163	• Automatic tool/workpiece measurement		●	●
164	• Reference point approach, automatic/via CNC program		●	●
165	MDA			
166	• Input in text editor		●	●
167	• Save MDA program		●	●
168	• Input screen forms for technology and positioning, cycle support		●	●
169	Teach-in		●	●
170	Automatic			
171	• Execution from USB interface on operator panel front		●	●
172	• Execution from HMI memory on NCU CF card		●	●
173	• Execution from network drive		●	●
174	• Execution from Hard disk (PCU50.5)		○	○
175	• Program control		●	●
176	• Program editing		●	●
177	• DRF offset		●	●
178	• Block search with/without calculation		●	●
179	CNC user memory expanded for programs	< 100MB	○	○
180	Execution from external storage EES		○	○
181	Repos (repositioning on the contour)			
183	• With operator command/semi-automatically		●	●
184	• Program-controlled		●	●
185	Preset			
186	• Set actual value		●	●
187	15,6" color display with touch screen		●	●
188	18,5" color display with touch screen		○	○
189	Plain text display of user variables		●	●
190	Multi-channel display		○	○
191	2D representation of 3D protection areas/work areas		●	●
192	Actual-value system for workpiece		●	●
193	CNC program messages		●	●
194	Screen blanking		●	●
195	Access protection, 7 levels		●	●
196	Operating software languages			
197	• Ch. S, En, Fr, Gr, It, Sp		○	●
198	• Ch. T, Kr, Pt		○	○
199	• Additional languages, use of language extensions		●	○
200	Working area limitation		●	●
201	Limit switch monitoring (Software and hardware limit switches)		●	●
202	Position monitoring		●	●
203	Standstill (zero-speed) monitoring		●	●
204	Clamping monitoring		●	●
205	2D/3D protection areas		●	●
206	Contour monitoring		●	●
207	Axis limitation from the PLC		●	●
208	Alarms and messages		●	●
209	Action log can be activated for diagnostic purposes		●	●
210	PLC status		●	●
211	Remote Control System (RCS) remote diagnostics			
212	• RCS Host remote diagnostics function		○	○
213	• RCS Commander (viewer function)		●	●
214	Integrated service planner for the monitoring of service intervals		●	●
215	Automatic measuring cycles		●	●
216	Contour handwheel		○	○
217	Integrate screens in SINUMERIK Operate with SINUMERIK Integrate Run MyScreens		●	●
218	Cross-mode actions (ASUPs and synchronized actions in all operating modes)		●	●
219	Axis collision protection PROT		○	●
220	Collision avoidance ECO (machine, working area)		○	○
221	Collision avoidance (machine, working area)		X	●
222	MDynamics 3-axis		●	X
223	MDynamics 5-axis		X	●

Programming & Editing function

Others functions (Operation, setting & Display, etc)

Responding to Customers Anytime, Anywhere

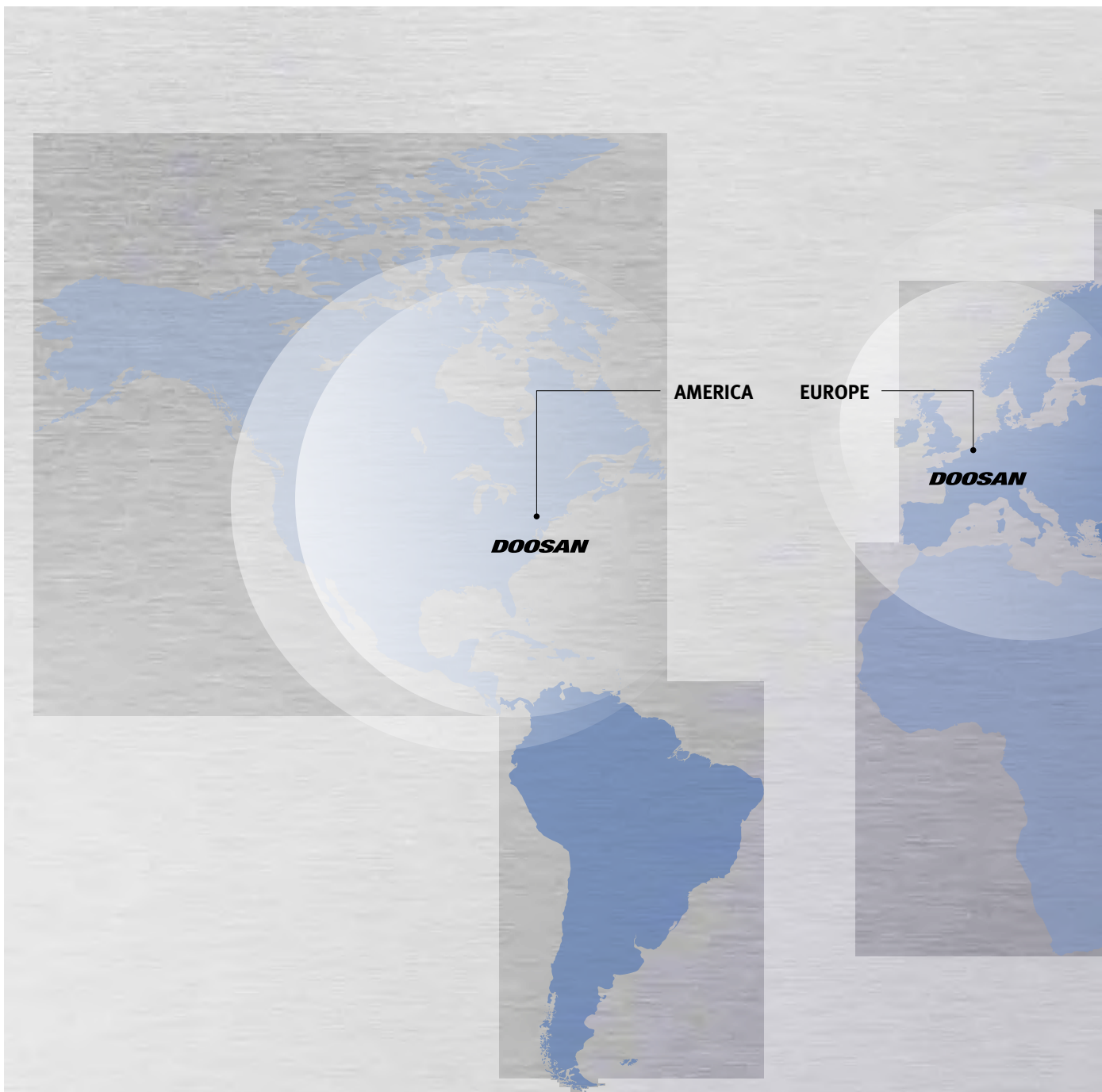
Basic Information

- Basic Structure
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Customer Support Service



Global Sales and Service Support Network

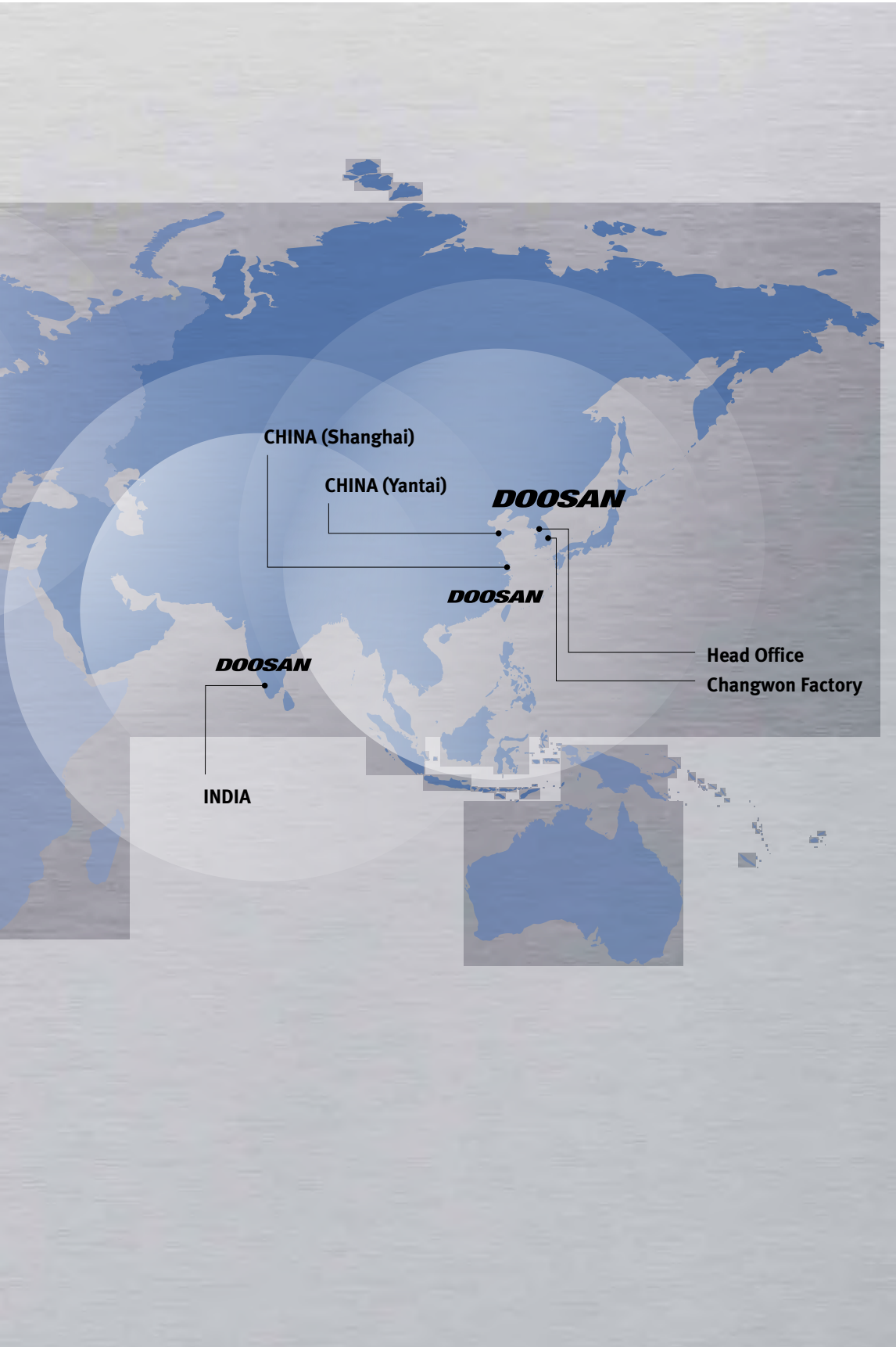
Corporations	Dealer Networks	Technical Centers	Service Post	Factories
4	164	51	198	3

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands.

By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts



- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services



- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support



- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training



- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

VCF 850 II series



Description	Unit	VCF850 [L] II / VCF850SR [LSR] II
Max. spindle speed	r/min	12000 {18000}*
Max. spindle torque (HEIDENHAIN)	N·m (ft·lbs)	126.3 {155}* (93.2 {114.4})
Max. spindle torque (FAUNC)	N·m (ft·lbs)	204 {117.7}* (150.6 {86.9})
Spindle motor power (HEIDENHAIN)	kW (Hp)	32/24 {30/24}* (42.9/32.2 {40.2/32.2})
Spindle motor power (FAUNC)	kW (Hp)	22/18.5 {22/18.5}* (29.5/24.8 {29.5/24.8})
Tool storage capacity	ea	30 {60}*
Dimensions (H x L x W)	mm (inch)	3205 x 3795 x 4440 [5440] (126.1 x 149.4 x 178.8 [214.2])

*{} : Option

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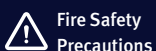
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* For more details, please contact Doosan Machine Tools.

* The specifications and information above-mentioned may be changed without prior notice.

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**Fire Safety
Precautions**

There is a high risk of fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting use coolants and modifying the machine without the consent of the manufacturer. Please check the SAFETY GUIDANCE carefully before using the machine.

ver. EN 200427 SU