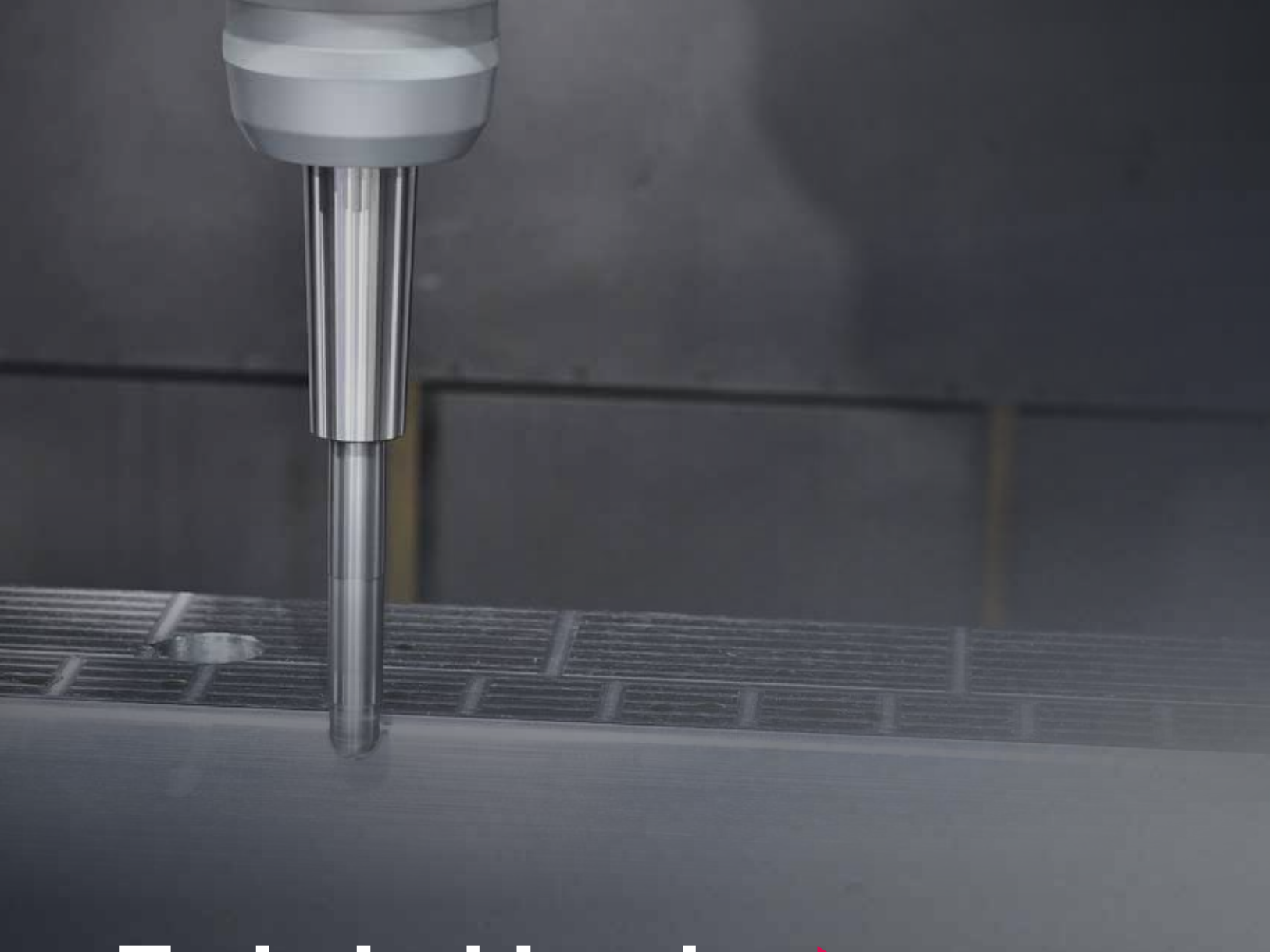
KF 7600L

High Speed, Wide Range Vertical Machining Center

WIA Machine Tools Vertical Machining Center

WIA MACHINE TOOLS



Technical Leader

KF7600L, developed by applying the accumulated know-how and the latest technology of WIA machine tools's a next-generation machine tool optimized for processing products with long material lengths through the application of a large and wide table.

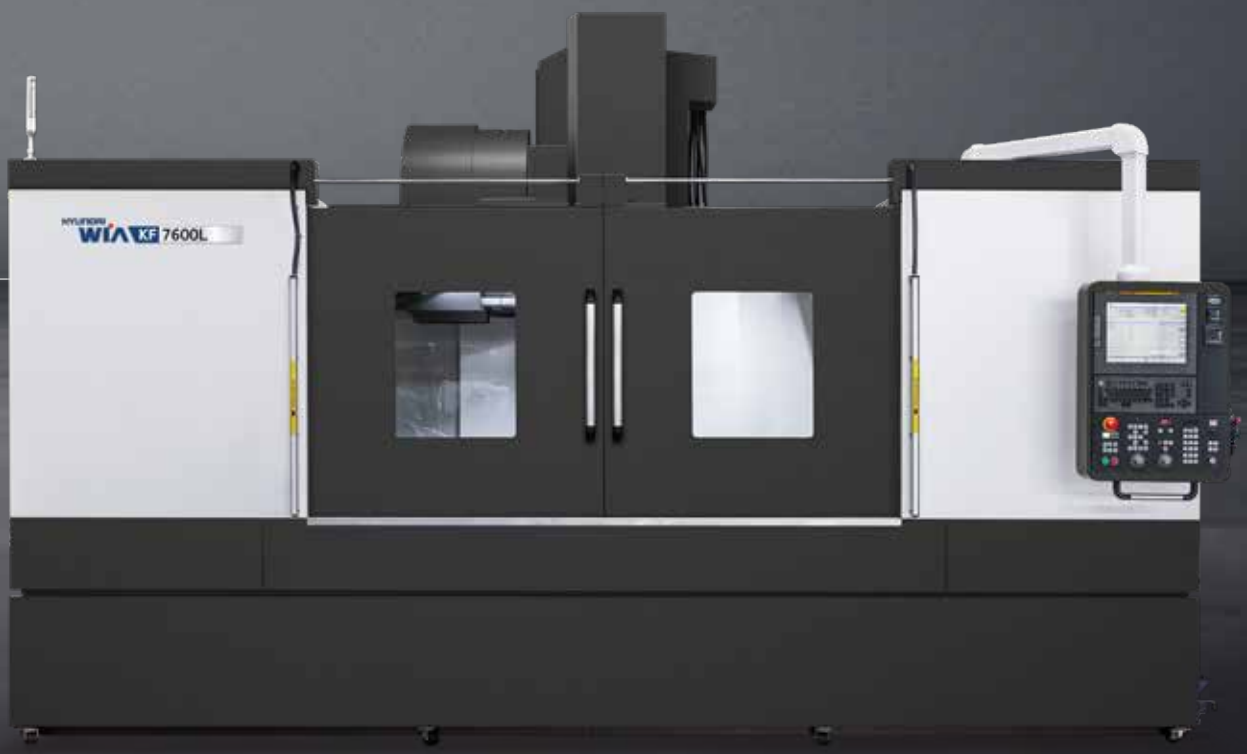
KF7600L		
Table Size (L×W)	mm(in)	2,250×760 (88.6″×29.9″)
Max. Load Capacity	kg(lb)	1,800 (3,968)
Spindle Taper	-	BBT 40
Spindle Speed	r/min	8,000 [12,000]
Sp. Power (Max./Cont.)	kW(HP)	18.5/15 (25/20) [18.5/11 (25/20)]
No. of Tools	EA	30 [40]
Travel (X/Y/Z)	mm(in)	2,100/760/635 (82.7″/29.9″/25″)
Rapid Traverse Rate	m/min(ipm)	30/30/24 (1,181/1,181/945)

[ ] : Option

KF 7600L

High Speed, Wide Range Vertical Machining Center

- Wide structure of 2,100mm (82.7″) X-axis
- Large table application for machining long parts
- 4 guideways for Y-axis to enhance feed
- High speed/High rigidity roller guide in all axes
- Securing rigidity by applying 3-row ball screw support bearings
- 2 way interior screw chip conveyor (Std.)



01 BASIC **STRUCTURE**

High Speed & Productivity Vertical Machining Center

ATC & Magazine

- No. of Tools : 30 [40] EA
- Max. Tool Length : 300 mm (11.8″)
- Max. Tool Dia. (W.T / W.O)

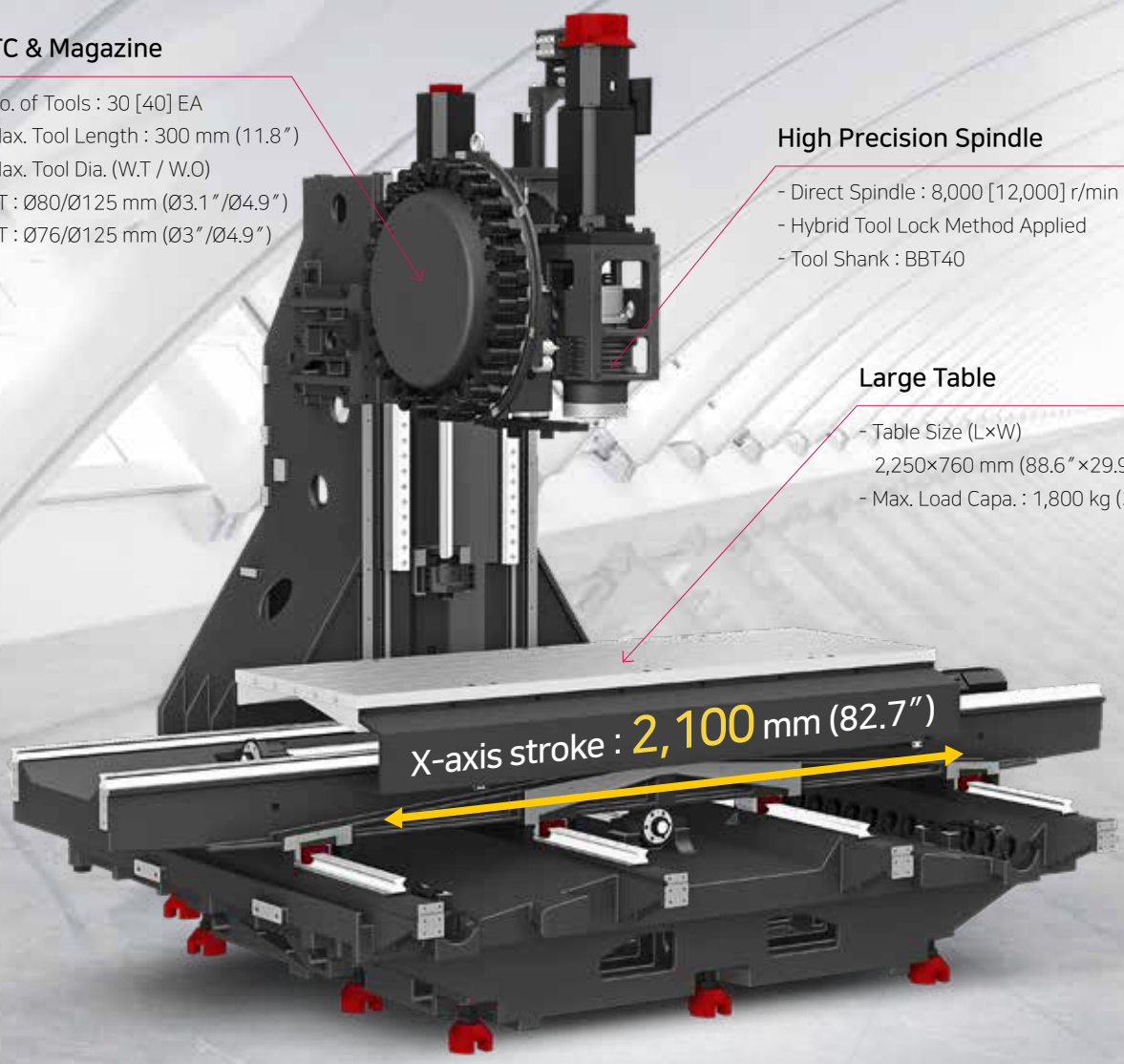
30T : Ø80/Ø125 mm (Ø3.1″/Ø4.9″)
40T : Ø76/Ø125 mm (Ø3″/Ø4.9″)

High Precision Spindle

- Direct Spindle : 8,000 [12,000] r/min
- Hybrid Tool Lock Method Applied
- Tool Shank : BBT40

Large Table

- Table Size (L×W)
  2,250×760 mm (88.6″×29.9″)
- Max. Load Capa. : 1,800 kg (3,968 lb)



HIGH-PRECISION, SPEED & LARGE WORKING AREA

HIGH-PRECISION STRUCTURE

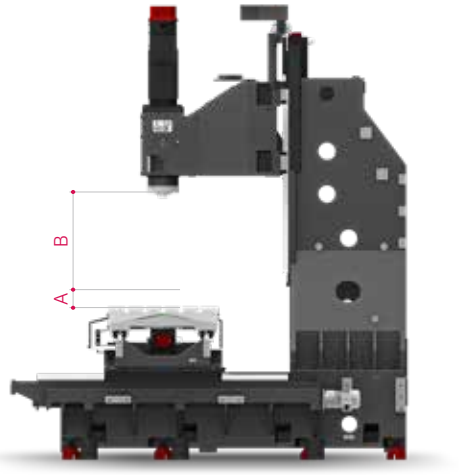
Optimal Structural Analysis

KF7600L is designed to have optimal structure through WIA machine tools's unique structural analysis.

In particular, enhancement of bed and column's rigidity makes excellent performance even in heavy duty cutting.

Distance from Table Top to SP. Nose

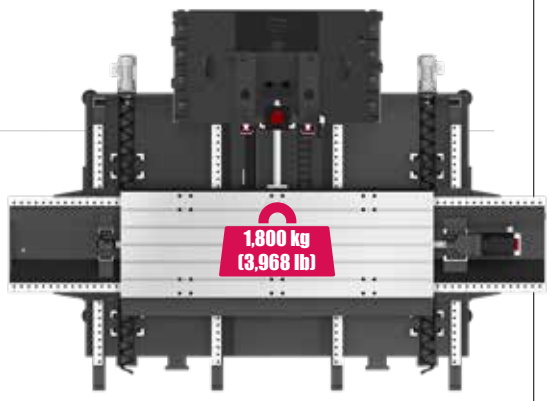
A~B : **150~785** mm (5.9″~30.9″)



WIDE MACHINING AREA

Expanded X-axis Structure

The X-axis feed length is designed to be **2,100mm** (82.7″), ensuring sufficient machining area for long-axis product machining. In particular, by extending the X-axis by more than 600mm compared to the existing equipment of the same class, even products that could not be processed with existing equipment can now be processed.



2,100 mm (82.7″)

⦿ Comparison of X-axis feed lengths of our Y-axis 700mm (27.6″) class equipment

Similar Model A	1,550 mm (61″)
Similar Model B	1,500 mm (59″)
KF7600L	**2,100** mm (82.7″)

Large Working Area Table

A large, 2,250×760mm (88.6″×29.9″) table is suitable for large product machining. The table has a maximum load capacity of up to 1,800kg (3,968 lb), which demonstrates its ability to handle heavy-duty tasks.

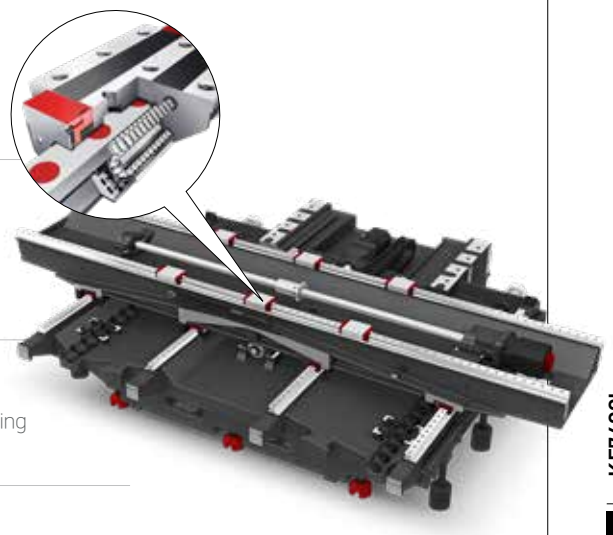
02 HIGH-SPEED FEED

Highest Quality, High-speed Vertical Machining Center

Travel (X/Y/Z)	**Rapid Traverse Rate** (X/Y/Z)
2,100/760/635 mm (82.7″/29.9″/25″)	30/30/24 m/min (1181/1181/945 ipm)

REDUCED NON-CUTTING TIME & IMPROVED FEED PRECISION

GUIDE WAY



High-Speed Roller LM Guideway

≒By applying an roller LM guide structure with high speed and rigidity, a rapid traverse rate of **30m/min** is achieved based on the X/Y axis.

Y-axis 4 Slideways

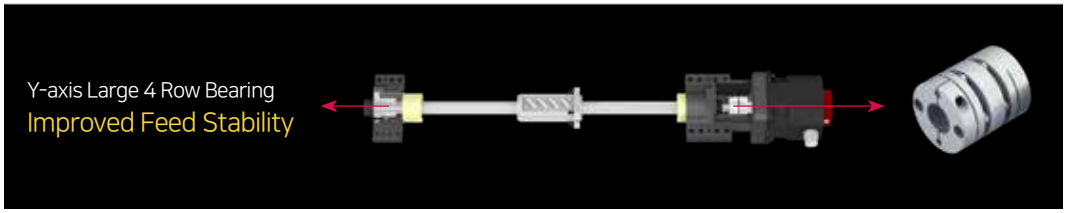
4 Slideways on the Y-axis to minimize sagging of X-axis, enabling manufacture of high precision products.

⦿ Comparison of X-axis rapid traverse rates of our X-axis 2,000~2,500mm class equipment

Similar Model A	X-axis : 2,450mm (96.5″)	16 m/min
Similar Model B	X-axis : 2,160mm (85″)	24 m/min
KF7600L	**X-axis : 2,100mm (82.7″)**	**30** m/min

Double Anchored Ball Screw

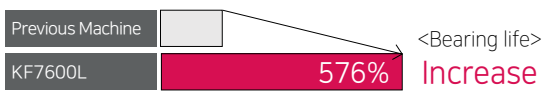
The pretensioned ball screw minimizes the expansion and contraction according to the heat and further reinforces the rigidity by the double anchor support method.
In addition, the coupling of the ballscrews and the highly reliable digital servo motors are connected by **metal plate couplings**, to reduce coupling breakage and backlash..



Increase in Durability of Z-axis ball screw

Lifetime of the bearing has been greatly increased by optimizing the spindle structure and lubrication method.

※ Customer Actual Data



03 HIGH PRECISION **SPINDLE**

Excellent machining performance with high-precision spindle₩

HIGH-PERFORMANCE, HIGH-PRECISION SPINDLE

SPINDLE

Direct Driven Spindle

The directly coupled spindle at a maximum revolution of 12,000rpm, allows high-speed processing. Additionally, the large diameter and the thickness of the spindle add to the stability of the machine.

Spindle Cooling (12,000 rpm Std.)

The spindle cooling system minimizes thermal displacement which can happen during lengthy machining operations, and offers continued accuracy based on the thermal stability.

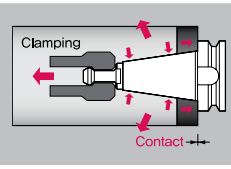
※ **Improved cooling capability with chilling through head frame**

Through Spindle Coolant (20/30/70 bar) OPTION

Through Spindle Coolant is exceedingly useful when drilling deep holes. It helps increase the lifetime of the tool, while decreasing cycle time.
The improved quality of rotary joint prevents oil leakage.

Dual Contact Spindle

The Big Plus spindle system (BBT40) provides dual contact between the spindle face and the flange face of the tool holder.



※ **Direct Spindle - Hybrid Tool Lock :** Reducing heat and noise by removing the hydraulic motor

Spindle Specifications

[ ] : Option

Speed r/min	Motor (Max./Cont.)	Torque (Max./Cont.)	Driving Method
8,000 rpm	**18.5/11** kW (25/20HP)	**118/71.6** N.m (87/528 lbf.ft)	DIRECT
[**12,000** rpm]	[**18.5/11** kW (25/20HP)]	[**118/52.5** N.m (87/38.7 lbf.ft)]	

04 ATC & MAGAZINE

High Productivity Achieved with High Rigidity, Accuracy Machining

No. of Tools

30 [40] EA

Tool Selection Method

Random

Max. Tool Length

300 mm (11.8″)

Max. Tool Weight

8 kg (17.6 lb)

Tool Shank

BBT40

Max. Tool Dia. (W.T/W.O)

30T : **Ø80/125** mm (Ø3.1″/Ø4.9″) [40T : **Ø76/125** mm (Ø3″/Ø4.9″)]

[ ] : Option

HIGH RIGIDITY, TOOL CHANGE SYSTEM

ATC & MAGAZINE

High Speed ATC

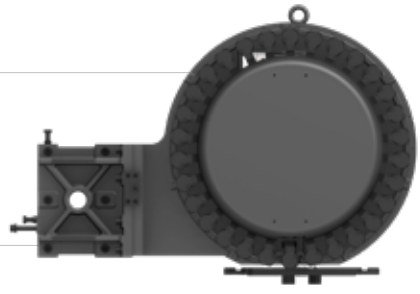
Position control through twin arm ATC on servo motors has been improved drastically. In addition, tool exchanging has become easier, reducing specific cutting time tremendously.

Position control on the Twin Arm ATC has improved drastically. The twin arm ATC enables faster tool change and increased productivity.

Tool Change Time (C-C)	3.7 sec

Magazine

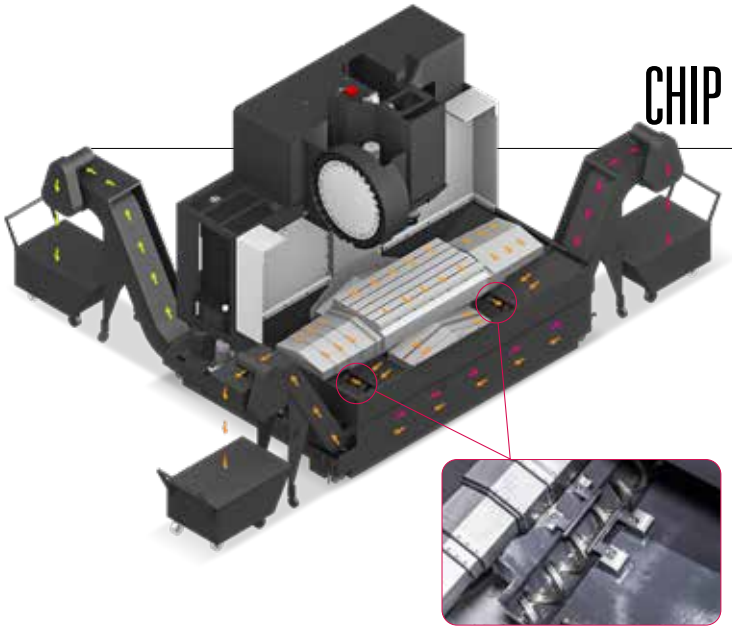
The tool magazine holds **30 tools** as standard and **40 tools** as an option. Due to the wider selection of tools and the random tool selection method, tool change time has improved.



Max. Tool Dia. / Length

05 USER CONVENIENCE

Various Devices for User Friendly



CHIP DISPOSAL SOLUTION & COOLANT UNIT

Cutting Air Blow (Opt.)

Bed Flushing Coolant (Opt.)

Gun Coolant (Opt.)

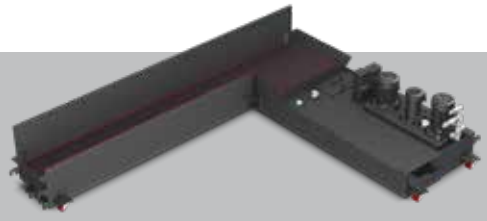
Air Gun (Opt.)

Interior Screw Chip Conveyor (Forward / Backward Rotation Function)

Dual screw type chip conveyors are located at each side of the bed which makes it convenient to remove chips. The interior screw and the chip conveyor operate at the same time and can be controlled separately at the time of prior consultation.

Upper-type Conveyor (Std.)

The upper type chip conveyor is applied as a standard to efficiently remove chips generated during machining. In addition, the 525 liter of large coolant tank provides a seamless machining environment even with large amounts of coolant.



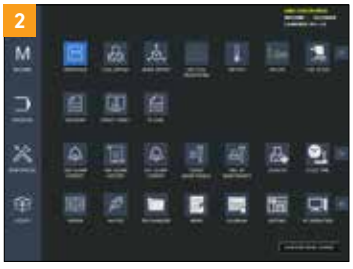
Hinge	Chip Type : Roughing Chip, Long Chip, Chip complex	Material : SS41, 45C, Cast Steel	Side/Rear Direction
	Highly efficient when disposing a lot of chips. Capable of handling stringy chips..		
Scraper	Chip Type : Finely broken chip blown out	Material : cast Iron, Nonferrous	
	Convenient for shortly cut chips.		
※ Screw	Chip Type : The lower portion of micro-chips	Material : Steel, Casting	
	Compresses and ejects chips to reduce chip Trouble.		
※ Drum Filter	Chip Type : Powder, Micro Chip	Material : AL	
	Advantageous in precision, as the chips do not flow in to the coolant nozzle.		

※ When ordering a screw or drum filter chip conveyor, prior consult with hyudai wia's sales person.

FANUC - Smart Plus

15″ Touch-type Monitor as a standard	
Smart Machine Control	Fast Cycle Time Technology
	Fine Surface Technology
Conversational Program	Smart Guide-i
i-HMI	Machining-aid Function
AI Contour Control	AICC-2 (200 blocks)
Smooth Tolerance Control	0.1μm command and specify tolerance
JERK Control	Diminished vibration by controlling acceleration speed
Machining Condition Selection	Designated machining level based on speed & quality
Machining Quality Control Function	Smooth Tolerance+ integrated support
Part Program Storage	5120M (2MB)
No. of Registerable Programs	1000 EA

SMART CNC (FANUC Smart Plus)



1. Dialogue Program (Smart Guide-i)
This software offers the maximum user convenience through dialogue manipulation from setup to processing. This includes writing processing programs and simulation checks.

2. LAUNCHER
This software offers shortcuts for quick access to specialized features and frequently used features.

SPECIFICATIONS

Standard & Optional

● : Standard ○ : Option ☆ : Prior Consultation - : Non Applicable

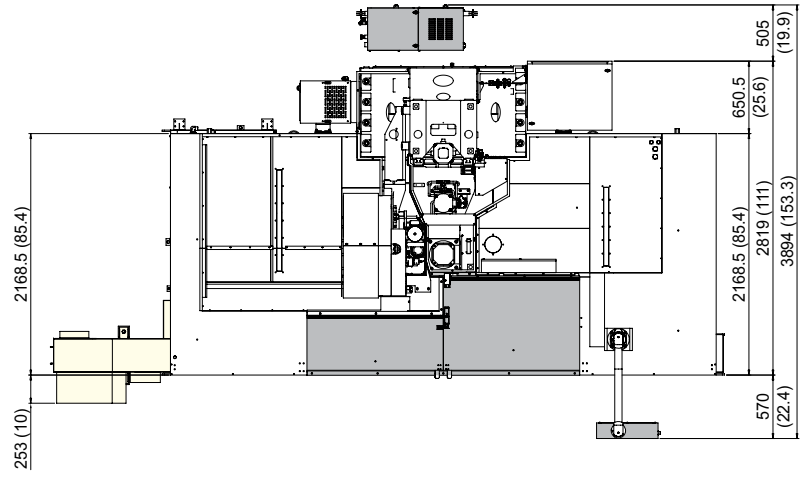
Spindle		KF7600L
8,000rpm (15kW)	Direct	●
12,000rpm (18.5kW)	Direct	○
Spindle Cooling System	8,000rpm	○
	12,000rpm	●
ATC		
ATC Extension	30	●
	40	○
Tool Shank Type	BBT40	●
	BCV40	○
U-Center	D'andrea	○
Pull Stud	45°	●
Table & Column		
T-Slot Table		●
NC Rotary Table		☆
High Column	300mm (11.8")	☆
Coolant System		
Std. Coolant (Main Spindle Nozzle)		●
Through Spindle Coolant	20bar	○
	30bar, 20 ℓ (5.3 gal)	○
	70bar, 15 ℓ (4 gal)	○
	70bar, 30 ℓ (7.9 gal)	○
Top Cover		●
Shower Coolant		○
Gun Coolant		○
Bed Flushing Coolant		●
Air Gun		○
Cutting Air Blow		○
Tool Measuring Air Blow (Only for TLM)		●
Air Blow for Automation		☆
Thru MQL Device (Without MQL)		☆
Coolant Chiller (Sub Tank)		☆
Power Coolant System (For Automation)		☆
Chip Disposal		
Coolant Tank	525 ℓ (138.7 gal)	●
Interior Screw Chip Conveyor		●
Upper Chip Conveyor (Hinge)	Left	○
	right	○
Screw Type Chip Conveyor	Left	☆
	right	☆
Drum Filter Type Chip Conveyor	Left	☆
	right	☆
	rear	☆
Chip Wagon	Standard (180 ℓ [47.5 gal])	○
	Swing (200 ℓ [52.8 gal])	○
	Large Swing (290 ℓ [76.6 gal])	○
	Large Size (330 ℓ [87.2 gal])	○
	Customized	☆
S/W		
Dialogue Program (HW-DPRO)		○
DNC software (HW-eDNC)		○
Smart Guide-i : FANUC		●
Smart S/W		☆

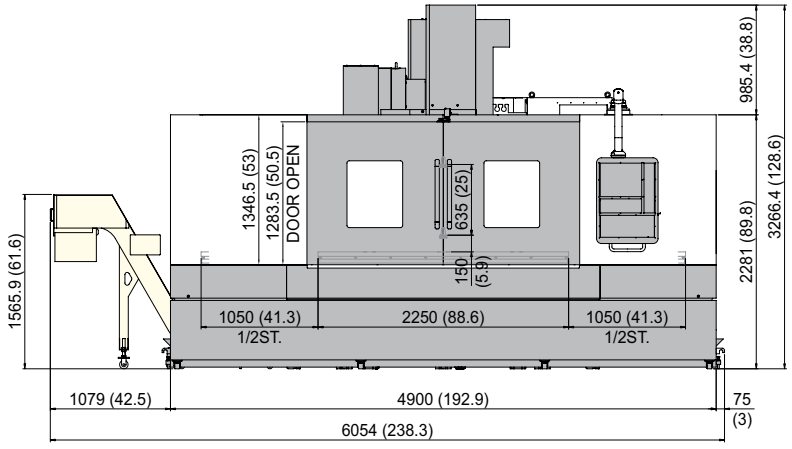
Electric Device		KF7600L
Call Light	1 Color : 🟨	●
Call Light & Buzzer	3 Color : 🟩🟨🟥B	○
Electric Cabinet Light		○
Remote MPG		●
3 Axis MPG		○
Work Counter	Digital	○
Total Counter	Digital	○
Tool Counter	Digital	○
Multi Tool Counter	Digital	○
Electric Circuit Breaker		○
Transformer	30kVA	○
Auto Power Off		○
Back up Module for Black out		○
Measuring Device		
Air Zero	TACO	○
	SMC	○
Work Measuring Device		○
TLM	TLM	○
	Laser	○
Tool Broken Detective Device		☆
Linear Scale	X/Y/Z Axis	○
Coolant Level Sensor (Bladder Type)		☆
Environment		
Air Conditioner		○
Oil Mist Collector		☆
Oil Skimmer (Only for Chip Conveyor)		○
MQL (Minimal Quantity Lubrication)		☆
Fixture & Automation		
Auto Door		○
Auto Shutter (Only for Automatic System)		○
Sub O/P		☆
NC rotary Table I/F	Single	○
	Channel	☆
Control of Additional Axis	1 Axis	○
	2 Axis	☆
External M Code 4EA		○
Automation Interface		☆
I/O Extension (In & Out)	16 Contact	○
	32 Contact	○
Hyd. Device		
Hyd. Unit for Fixture	45bar	-
	70bar	○
	100bar	○
	Customized	☆
ETC		
Tool Box		●
Customized Color	Need for Munsel No.	☆
CAD&CAM Software		☆
Thermal displacement compensation		○

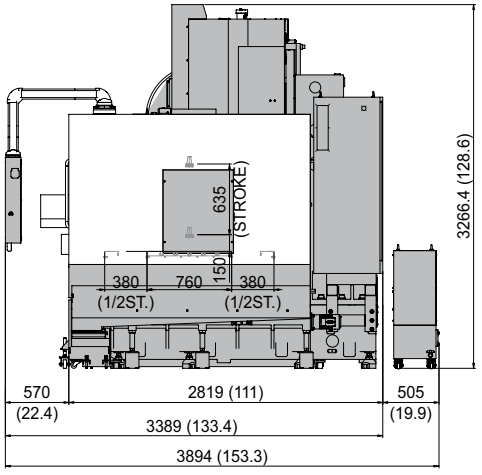
Through Spindle Coolant* : Please check the filter types with sales representative.
Specifications are subject to change without notice for improvement.

External Dimensions

unit : mm(in)

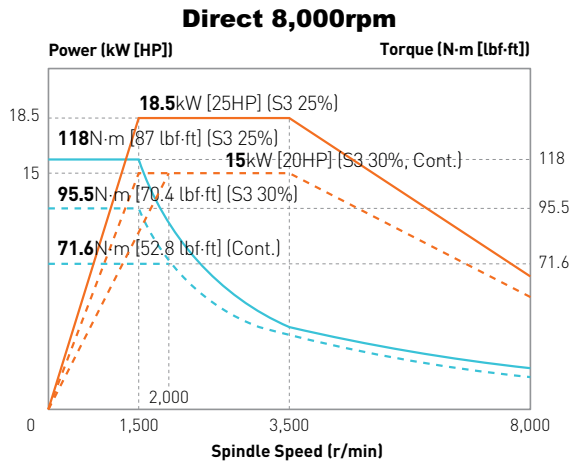






SPECIFICATIONS

Spindle Output/Torque Diagram



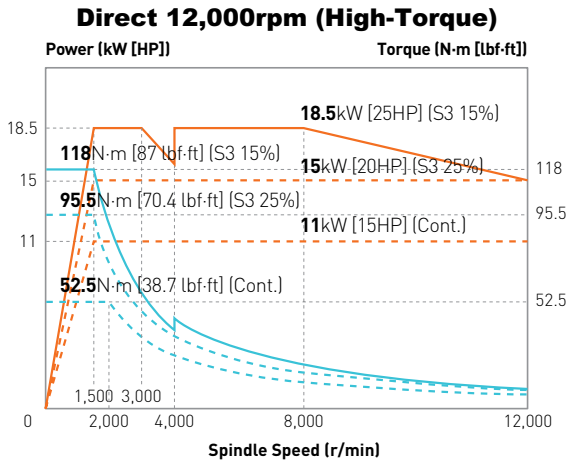
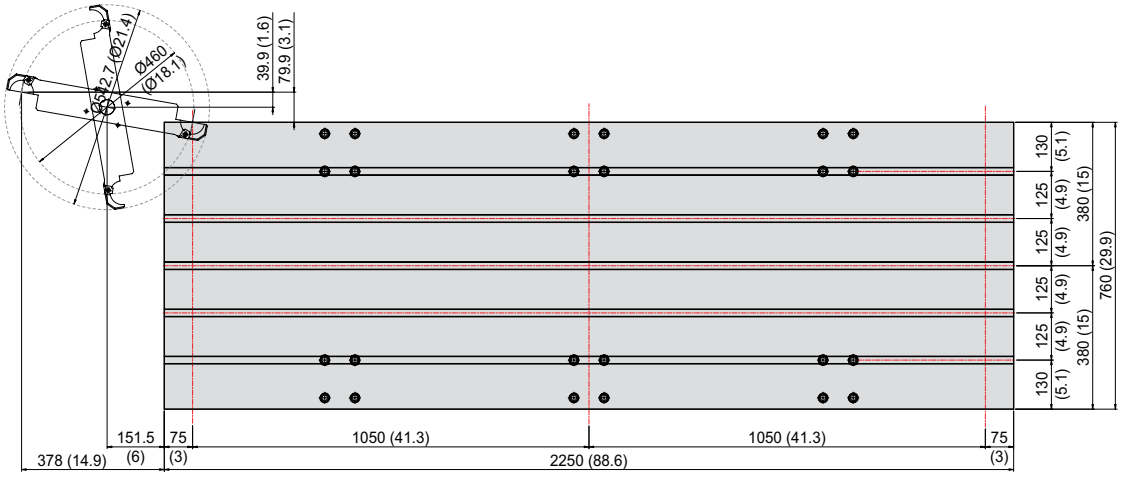
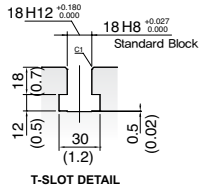


Table Dimensions

unit : mm(in)



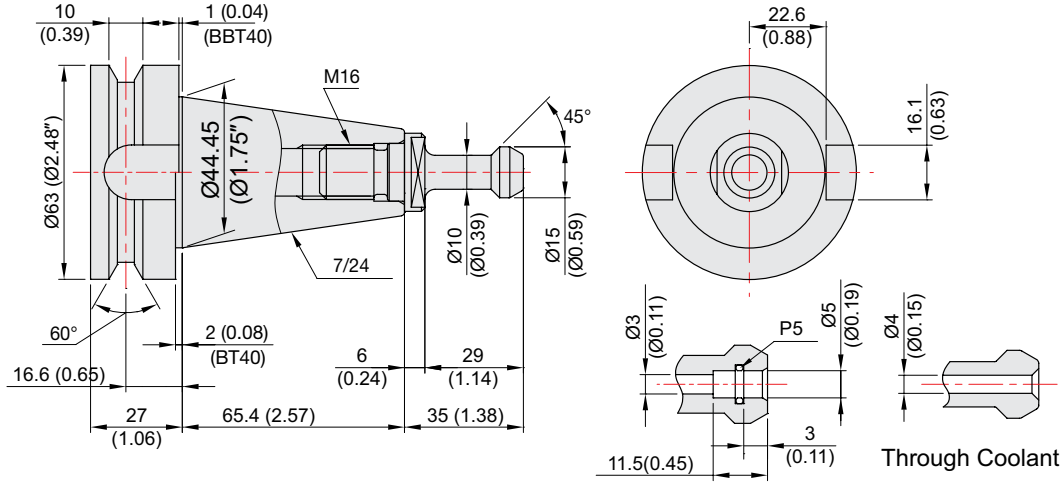


SPECIFICATIONS

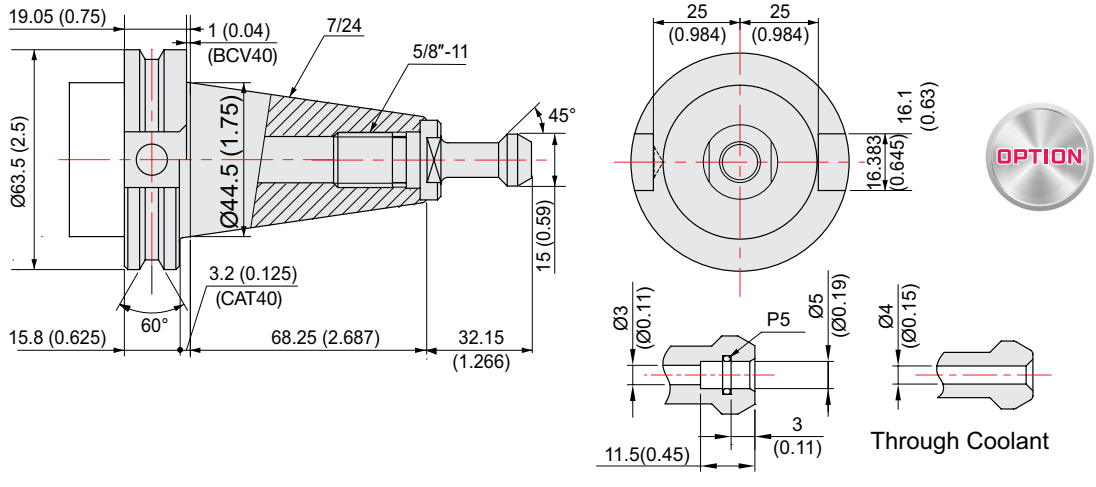
Tool Shank

unit : mm(in)

BT40/BBT40, BIG PLUS



CAT40/BCV40



SPECIFICATIONS

Specifications

[ ] : Option

ITEM				KF7600L
TABLE	Table Size (L×W)		mm(in)	2,250×760 (88.6″×29.9″)
	Maximum Load Capacity		kg(lb)	1,800 (3,968)
SPINDLE	Spindle Taper		-	BBT40
	Spindle Speed (rpm)		r/min	8,000 [12,000]
	Spindle Power (Max./Cont.)		kW(HP)	18.5/15 (25/20) [18.5/11 (25/20)]
	Spindle Torque (Max./Cont.)		N·m(lbf·ft)	118/71.6 (87/52.8) [118/52.5 (87/38.7)]
	Spindle Driving Method		-	Direct
FEED	Travel (X/Y/Z)		mm(in)	2,100/760/635 (82.7″/29.9″/25″)
	Distance from Table Top to Sp. Center		mm(in)	150~785 (5.9″~30.9″)
	Distance from Table Center to Sp. Nose		mm(in)	820 (32.3″)
	Rapid Traverse Rate (X/Y/Z)		m/min(ipm)	30/30/24 (1,181/1,181/945)
	Slide Type		-	Roller Guide
ATC	Number of Tools		ea	30 [40]
	Tool Shank		-	BBT40
	Max. Tool Dia. (W.T/W.O)		mm(in)	Ø80/Ø125 (Ø3.1″/Ø4.9″) [Ø76/Ø125 (Ø3″/Ø4.9″)]
	Max. Tool Length		mm(in)	300 (11.8″)
	Max. Tool Weight		kg(lb)	8 (17.6)
	Tool Selection Method		-	Random
	Tool Change Time	T-T	sec	3.7
		C-C	sec	4.7
TANK CAPACITY	Coolant Tank		ℓ (gal)	525 (138.7)
	Lubricating Tank		ℓ (gal)	4 (1)
	Hydraulic Tank		ℓ (gal)	- (BOOSTER CYLINDER)
POWER SUPPLY	Air Consumption (0.5MPa)		ℓ /min(gal)	110 (29)
	Electric Power Supply		KVA	26
	Thickness of Power Cable		Sq	Over 25
	Voltage		V/Hz	220/60 (200/50)
MACHINE	Floor Space (L×W)		mm(in)	4,900×2,819 (192.9″×111″)
	Height		mm(in)	3,266.4 (128.6″)
	Weight		kg(lb)	13,000 (28,660)
CNC	Controller		-	FANUC i Series - Smart Plus

CONTROLLER

FANUC i Series - Smart Plus

[ ] : Option ☆ Needed technical consultation

Controlled axis / Display / Accuracy Compensation	
Control axis	3 axis (X, Y, Z)
	[4 axis (X, Y, Z, A)] [5 axis (X, Y, Z, A, C)]
Simultaneously controlled axis	3 axis [Max. 4 axis]
Least setting Unit	X, Y, Z axis : 0.001 mm (0.0001 inch)
	B axis : 1 deg [0.001] deg
Least input increment	X, Y, Z axis : 0.001 mm (0.0001 inch)
	B axis : 1 deg [0.001] deg
Inch / Metric conversion	
High response vector control	
Interlock	All axis / Each axis
Machine lock	All axis
Backlash compensation	± 0 ~ 9999 pulses (Rapid traverse / Cutting feed)
Position switch	
LCD / MDI	15 inch LCD unit (with Touch Panel)
Feedback	Absolute motor feedback
Stored stroke check 1	Over travel
Stored stroke check 2, 3	
Stored pitch error compensation	
Operation	
Automatic operation (Memory)	
MDI operation	
DNC operation	Needed DNC software / CF card
Program restart	
Wrong operation prevention	
Program check function	Dry run, Program check, Z axe Machine lock
	Stored limit check before move
Single block	
Search function	Program Number / Sequence Number
Handle interruption	
Interpolation functions	
Nano interpolation	
Positioning	G00
Linear interpolation	G01
Circular interpolation	G02, G03
Exact stop mode	Single : G09, Continuous : G61
Dwell	G04, 0 ~ 9999.9999 sec
Skip	G31
Reference position return	1st reference, G28 / 2nd reference, G30
	Ref. position check, G27
Single direction positioning	G60
Thread synchronous cutting	G33
Helical interpolation	Circular + Linear 2 axis (Max.)
Feed function / Acc. & Dec. control	
Manual feed	Rapid traverse
	Jog : 0~2,000mm/min (79 ipm)
	Manual handle : x1, x10, x100 pulses
	Reference position return
Cutting Feed command	Direct input F code
Feedrate override	0 ~ 200% (10% Unit)
Rapid traverse override	1%, 25%, 50%, 100%
Override cancel	
Feed per minute	G94
Feed per revolution	G95
Cylindrical interpolation	G07.1
Inverse time feed	G93
Look-ahead block	200 blocks (AI APC)
Program input	
Tape Code	EIA / ISO
Optional block skip	9 ea
Absolute / Incremental program	G90 / G91
Program stop / end	M00, M01 / M02, M30
Maximum command unit	± 999,999.999 mm (± 99,999.9999 inch)
Plane selection	X-Y, G17 / Z-X, G18 / Y-Z, G19
Workpiece coordinate system	G52, G53, 48 pairs (G54.1 P1 ~ 48)
Manual absolute	Fixed ON
Programmable data input	G10
Sub program call	10 folds nested
Custom macro	#100 ~ #199, #500 ~ #999
Programmable mirror image	G51.1, G50.1
G code preventing buffering	G4.1
Optional chamfering corner R	

Program input	
Polar coordinate command	G15, G16
Canned cycle	G73, G74, G76, G80 ~ G89
Scaling	G50, G51
Coordinate system rotation	G68, G69
Conversational Program	Smart Guide-i
Auxiliary function / Spindle speed function	
Level-up M Code	Multi / Bypass M code
Spindle speed function	S & 5 digit , Binary output
Spindle override	0% ~ 150% (10% Unit)
Spindle orientation	M19
Retraction for rigid tapping	
FSSB high speed rigid tapping	
Tool function / Tool compensation	
Tool function	Max. T8 digit
Tool life management	
Tool offset pairs	400 pairs
Tool nose / radius compensation	G40, G41, G42
Tool length offset	G43, G44, G49
Tool offset memory C	Tool geometry and wear
	(Cutter and tool length)
Tool length measurement	Z axe Input C
Editing function	
Part program storage size	5,120m (2MB)
No. of registerable programs	1,000 ea
Program protect	
Background editing	
Extended part program editing	Copy, move and change of NC program
Memory card program edit	
Data input / output & Interface	
I/O interface	CF card, USB memory
	Embedded Ethernet interface
Screen hard copy	
External message	
External key input	
External workpiece number search	
Automatic data backup	
Setting, display and diagnosis	
Self-diagnosis function	
History display & Operation	Alarm & Operator message & Operation
Run hour / Parts count display	
Maintenance information	
Actual cutting feedrate display	
Display of spindle speed / T code	
Graphic display	
Operating monitor screen	Spindle / Servo load etc.
Power consumption monitoring	Spindle & Servo
Spindle / Servo setting screen	
Multi language display	Support 24 languages
Display language switching	Selection of 5 optional Languages
LCD Screen Saver	Screen saver

Option	
Fast ethernet	Needed option board
Data server	Needed option board
Protection of data at 8 levels	
Additional Axis	
Manual handle feed	2/3 units
Addition of custom macro	#100 ~ #199,
	#500 ~ #999, #98000 ~ #98499
Add. Workpiece	Max. 300 pairs (G54.1 P1 ~ P300)
AICC II	400 blocks ☆

Figures in inch are converted from metric values.
The FANUC controller specifications are subject to change based on the policy of company CNC supplying.

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