

# F750B/960B

HYUNDAI WIA Heavy Duty Cutting Vertical Machining Center



# Technical Leader

The Vertical Machining Center F750B / F960B, designed by Hyundai WIA with years of expertise and the latest technology, is a heavy duty cutting machine with high precision and productivity.



MODEL	Y-Axis Stroke		Taper		Magazine		
	750mm(29.5")	960mm(37.8")	BBT50	BT50	20 Tool	30 Tool	40 Tool
F750B	●		●		●	○	
F960B		●	●		●	○	○

● : Standard    ○ : Option

The Machining Center for  
Large Work Spaces and Heavy Duty Cutting

# F750B/960B

- Main spindle with ultra precision cylindrical roller bearings
- Rigid geared spindle enables powerful, heavy duty cutting
- Box guideways on all axes for superb heavy duty cutting
- 4 Guideways employ 10-face contact design (F960B)
- Air Semi-Rising slideway to decrease feed load
- SIEMENS 828D installation for variety of processing softwares



# 01

F750B/960B

## F750B Basic Features

Heavy Duty Cutting by Highly Rigid & Accurate Mechanism  
Vertical Machining Center



01

### Box Guideway for All Axes

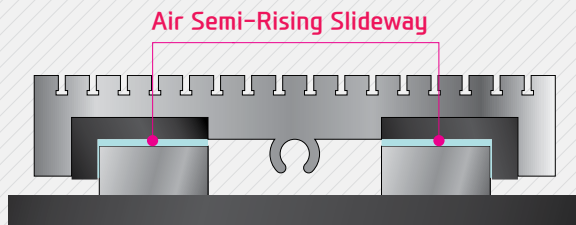
Box guideways effectively offset vibration enabling the machining of high precision products.

The travel load is spread evenly on the surface of guideways. This enhances stability and rigidity allowing high performance heavy duty cutting.

02

### Air Semi-Rising Slideway

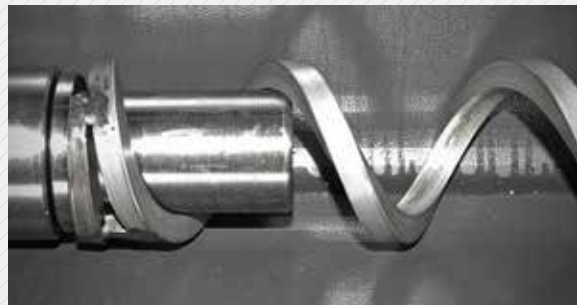
By applying the air semi-rising slideways, the load on the X/Z-axis slideway is decreased. Therefore, positioning and repeatability accuracy can be maintained for a long time.



03

### Screw Type Chip Conveyor

Dual screw type chip conveyors are located at each side of the bed which makes it convenient to remove chips.



04

### Gear Type Spindle

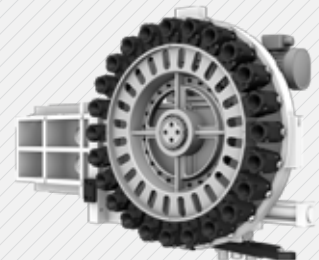
F750B is designed with a 2 step gear drive, providing both high spindle speed and powerful torque.



05

### High Speed ATC

ATC with high precision CAM provides fast and accurate tool change, reducing non-cutting time.



## Basic Features

20 Tool Magazine



### High Column **OPTION**

High columns of 250mm(9.8") is provided.

HYUNDAI WIA  
MACHINE TOOL

**F750B/960B**  
Vertical Machining Center

04  
+  
05

## Powerful Cutting Capability & Large Working Area

- ◎ **Travel** (X/Y/Z axis) : 1,550/750/720 mm (61"/29.5"/28.3")
- ◎ **Spindle Driving Method** : 2 Step Gear [Built-In]
- ◎ **Spindle Speed** : 4,500 [8,000] [12,000] [4,500] [8,000] rpm
- ◎ **Spindle Output** (Max./Cont.) : 18.5/15 [18.5/15] [30/25] [30/20] [30/20] kW  
(24.8/20.1 [24.8/20.1] [40.2/33.5] [40.2/26.8] [40.2/26.8] HP)
- ◎ **Spindle Torque** (Max./Cont.) : 893/732 [657/532] [420/238] [1,449/966] [1,058/704] N·m  
(658.6/539.9 [464.6/392.4] [309.8/175.5] [1,068.7/712.5] [780.3/519.2] lbf·ft)

[SIEMENS]

# 02

F750B/960B

## F960B Basic Structure

Heavy Duty Cutting by Highly Rigid & Accurate Mechanism  
Vertical Machining Center



01

### 10-face Contact Y-axis Slideway

The table is supported at all times by 10-face contact box guideways. This allows for a maximum table load of **4,500 kg (9,921 lb)** without any distortion in the table.

### Air Semi-Rising Slideway

By applying the air semi-rising slideways, the load on the X/Z-axis slideway is decreased. Therefore, positioning and repeatability accuracy can be maintained for a long time.

### Box Guideway for All Axes

Box guideways effectively offset vibration, enabling the machining of high precision products.

The travel load is spread evenly on the surface of guideways. This enhances stability and rigidity allowing high performance heavy duty cutting.

02

### Double Anchored Ball Screw

In order to eliminate thermal growth and increase accuracy, all axes are driven by high precision double anchored ballscrews.

The pretensioned design provides outstanding positioning and repeatability with virtually no thermal growth.



### Directly Coupled Servo Motor

The ballscrews are directly coupled to the servo motor. This eliminates the need for any transmission parts, which may impact machine accuracy and efficiency.

03

### Gear Type Spindle

2 step Gear Type Spindle provides powerful torque at low speed and stable rotation at high speed, enabling a wide range of machining.

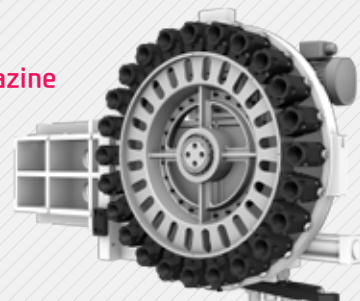


04

### Magazine

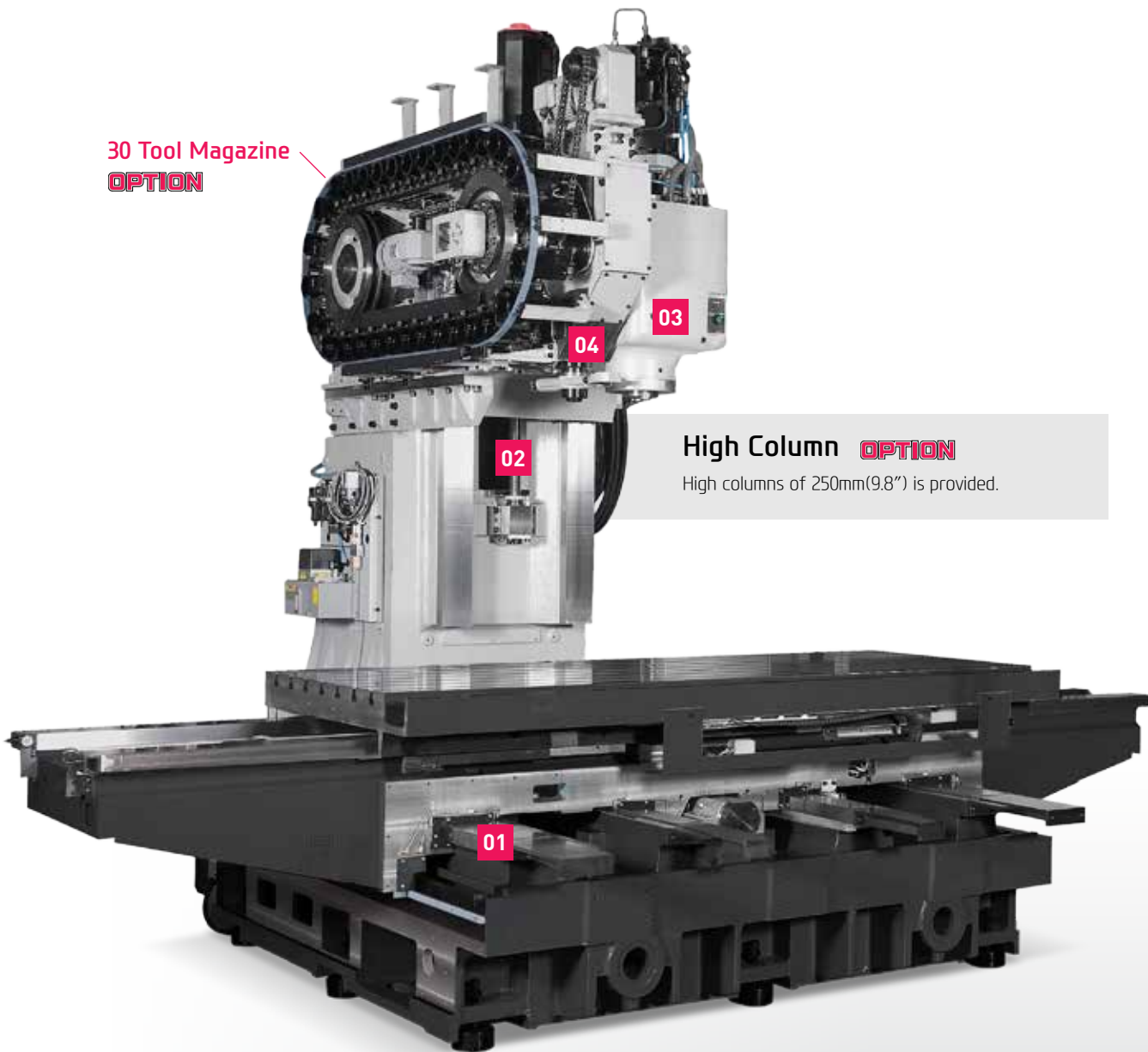
F960B provides a tool magazine of 20 pockets as standard. 30/40 pockets are provided as an option

### 20 Tool Magazine





## Basic Structure



30 Tool Magazine  
**OPTION**

**High Column** **OPTION**

High columns of 250mm(9.8") is provided.

## Powerful Cutting Capability & Large Working Area

- **Travel (X/Y/Z axis) :** 2,450/960/850 mm (96.5"/37.8"/33.5")
- **Spindle Driving Method :** 2 Step Gear [Built-In]
- **Spindle Speed :** 8,000 [12,000] [8,000] rpm
- **Spindle Output (Max./Cont.) :**  
22/18.5 [30/25] [27.8/18.5] kW (29.5/24.8 [40.2/33.5] [37.3/24.8] HP)
- **Spindle Torque (Max./Cont.) :**  
776/657 [420/238] [1,316/877] N·m (572.3/484.6 [309.8/175.5] [970.6/646.8] lbf·ft)

**n3**  
F750B/960B

## High Precision Spindle

High Accuracy & Excellent Performance  
Vertical Machining Center





## Spindle

The spindle is designed with cylindrical roller bearings, a thicker spindle nose and an enlarged flange diameter.

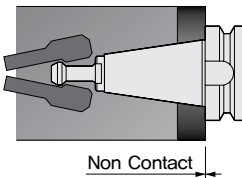
Also, improved powerful clamping force allows enhanced machining ability.

## 2 Step Gear Type Spindle

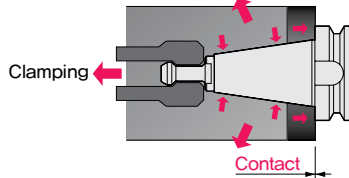
2 Step Gear Type Spindle provides powerful torque at low speed and stable rotation at high speed, enabling a wide range of machining.



Before Clamping



After Clamping



## Dual Contact Spindle

The Big Plus spindle system (BBT50) provides dual contact between the spindle face and the flange face of the tool holder. This greatly increases tool rigidity, reduces run out and adds significant productivity to machining applications.

(F960B Gear Spindle : Non Application)

- ❖ The increase in standard diameter improves rigidity and ATC repeatability, and Z-axis displacement prevention further extends tool life.

## Through Spindle Coolant **OPTION**

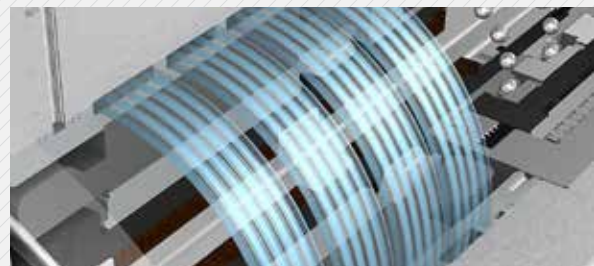
Through Spindle Coolant is exceedingly useful when drilling deep holes. It helps increase the lifetime of the tool, while decreasing cycle time.



20 bar / 30 bar / 70 bar  
(290 psi / 435 psi / 1,015 psi)

## Spindle Cooling

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



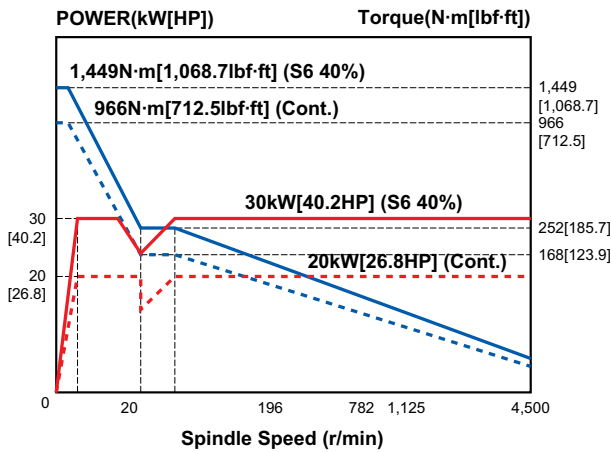


# SIEMENS 1PH8 Spindle Motor

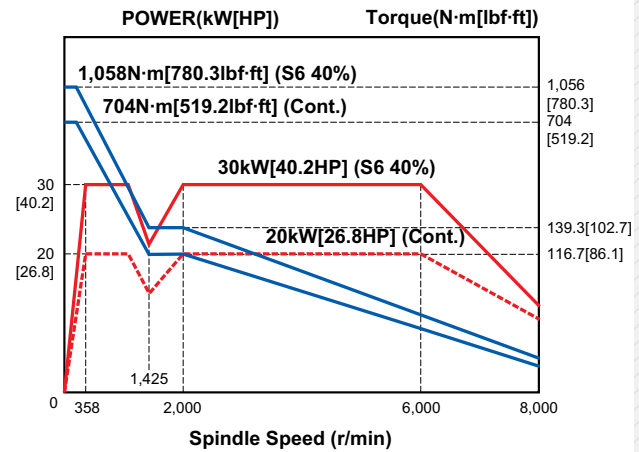
The 1PH8 Series is a high quality performance motor providing concentricity of 10 $\mu$ m and fast response time.

The servo motor operates smoothly in extreme environments such as high temperature, dust and dirt. The unique heat emission minimizing design makes it possible to maintain a high degree of accuracy at all times.

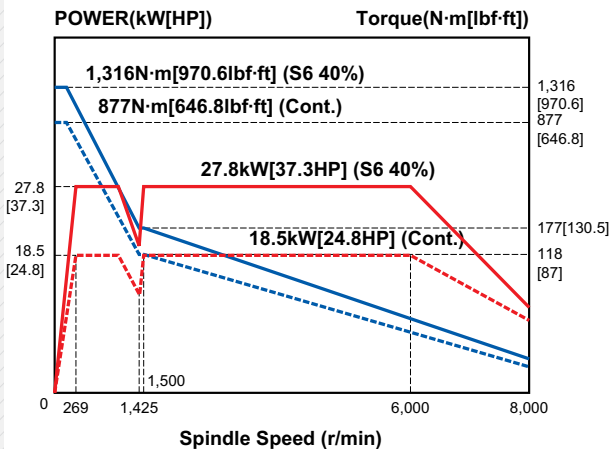
## F750B SIEMENS 4,500rpm



## F750B SIEMENS 8,000rpm

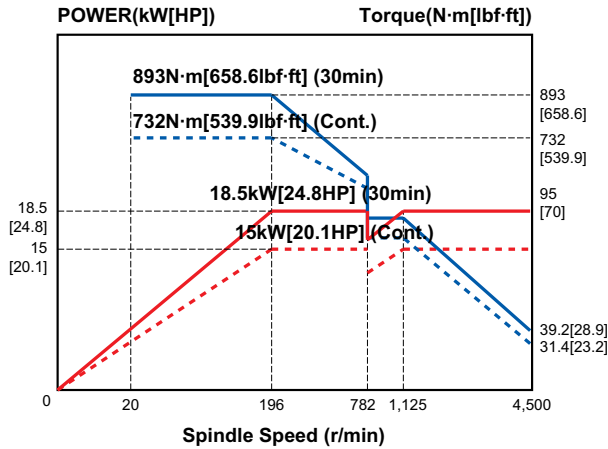


## F960B SIEMENS 8,000rpm

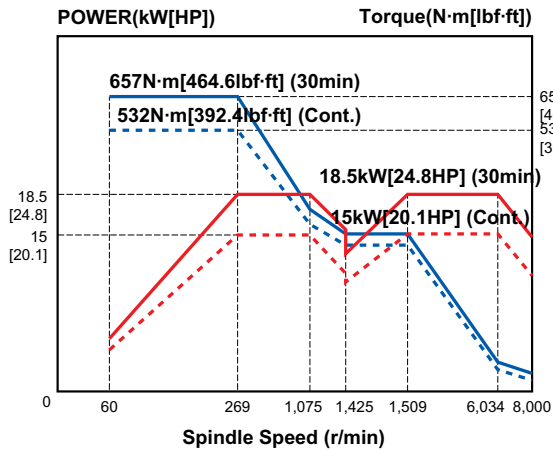


## FANUC Spindle Motor

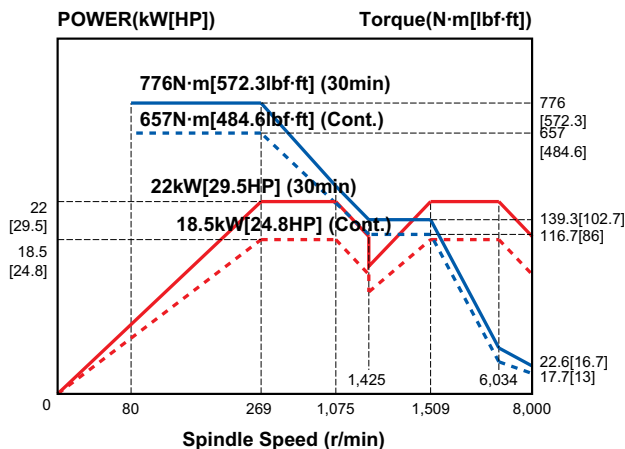
**F750B FANUC 4,500rpm**



**F750B FANUC 8,000rpm**



**F960B FANUC 8,000rpm**

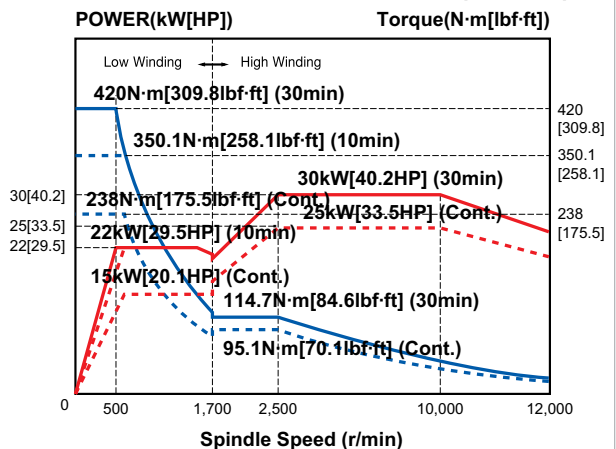


### Built-in Spindle OPTION

The spindle head is designed to minimize heat displacement which helps maintain high accuracy.



**F750B/960B FANUC 12,000rpm (Built-in)**

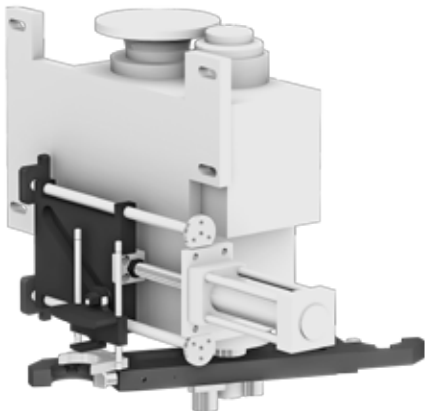
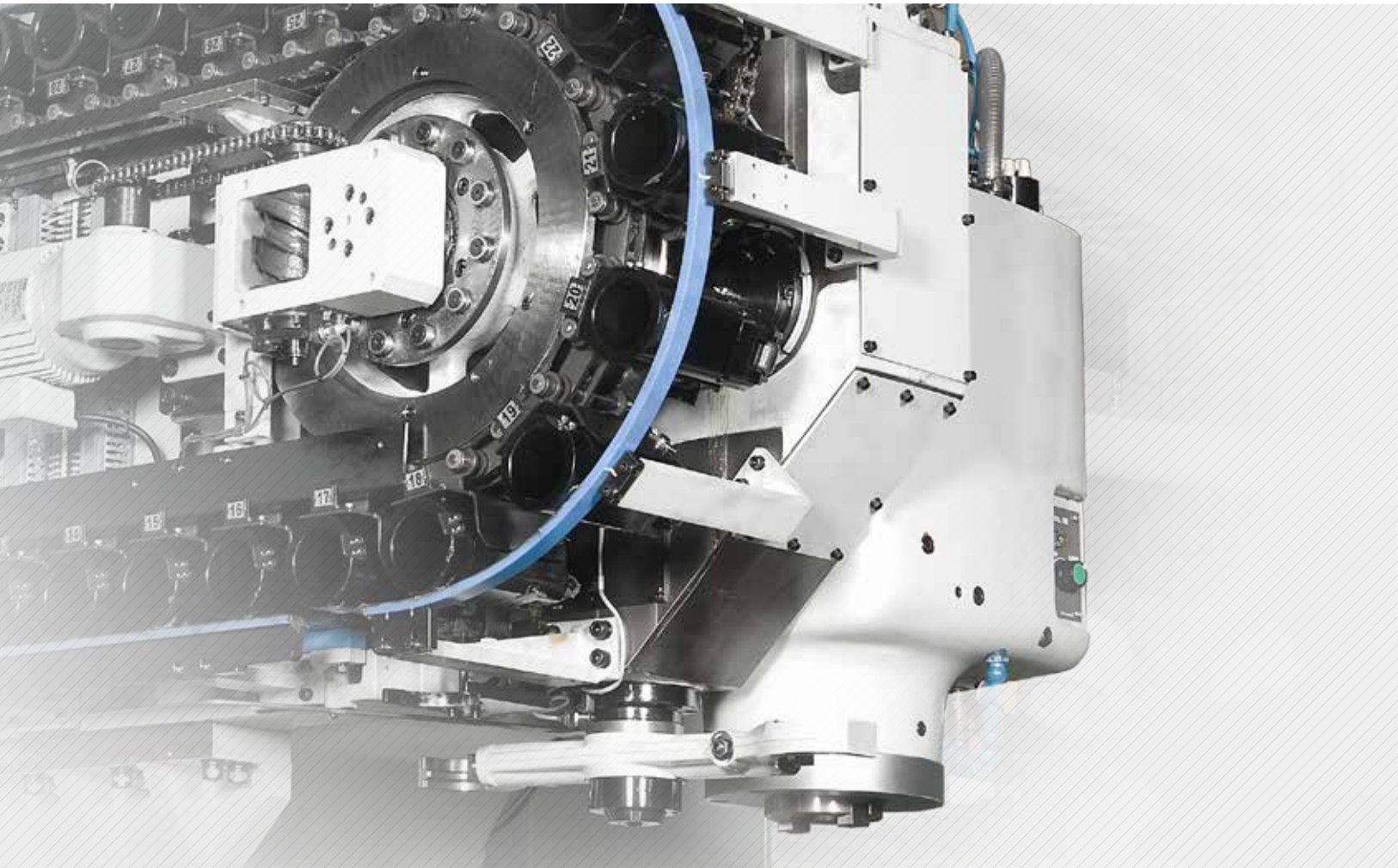


# 04

F750B/960B

## ATC & Magazine

High Productivity Achieved with High Rigidity,  
Accurate Machining



### ATC & Magazine

The tool magazine holds 20 tools as standard with 40 tools as option for F960B and 30 for F750B. Due to the wider selection of tools and the random tool selection method, tool change time has been improved.

The Double Arm ATC provides faster and reliable tool changing to help reduce machining cycle time.

- No. of Tools F750B : 20 [30] EA F960B : 20 [30] [40] EA
- Tool Shank : **BT50**
- Max. Tool Weight : 20 kg (44.1 lb)
- Tool Selection Method : **Random**



## User Convenience

### Measuring Device **OPTION**

#### Touch Sensor

Workpiece coordinate values can be set automatically using the optional spindle probe.



#### TLM – Laser & Touch

Tool lengths and diameters can be set automatically using the optional tool setter. This can also be used to monitor attrition and detect broken tools.



Laser Type

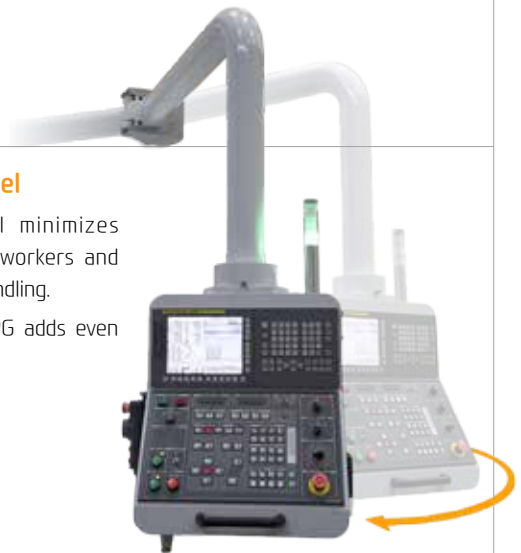


Touch Type

### Control Panel

#### Swing Arm Control Panel

Swing arm control panel minimizes unnecessary movement of workers and allows optimal control and handling. The optional CNC 3-axis MPG adds even more accessibility to workers.



### Precision Device **OPTION**

#### NC Rotary Table

5-axis rotary table makes it possible to process various shapes.



### Hydraulic Device **OPTION**

#### Hydraulic Supply Unit

Instead of the standard hydraulic supply unit, an optional fixture unit can bring the pressure up to **100 bar (1,450 psi)**, maximizing the clamping force on the fixture.





# 05

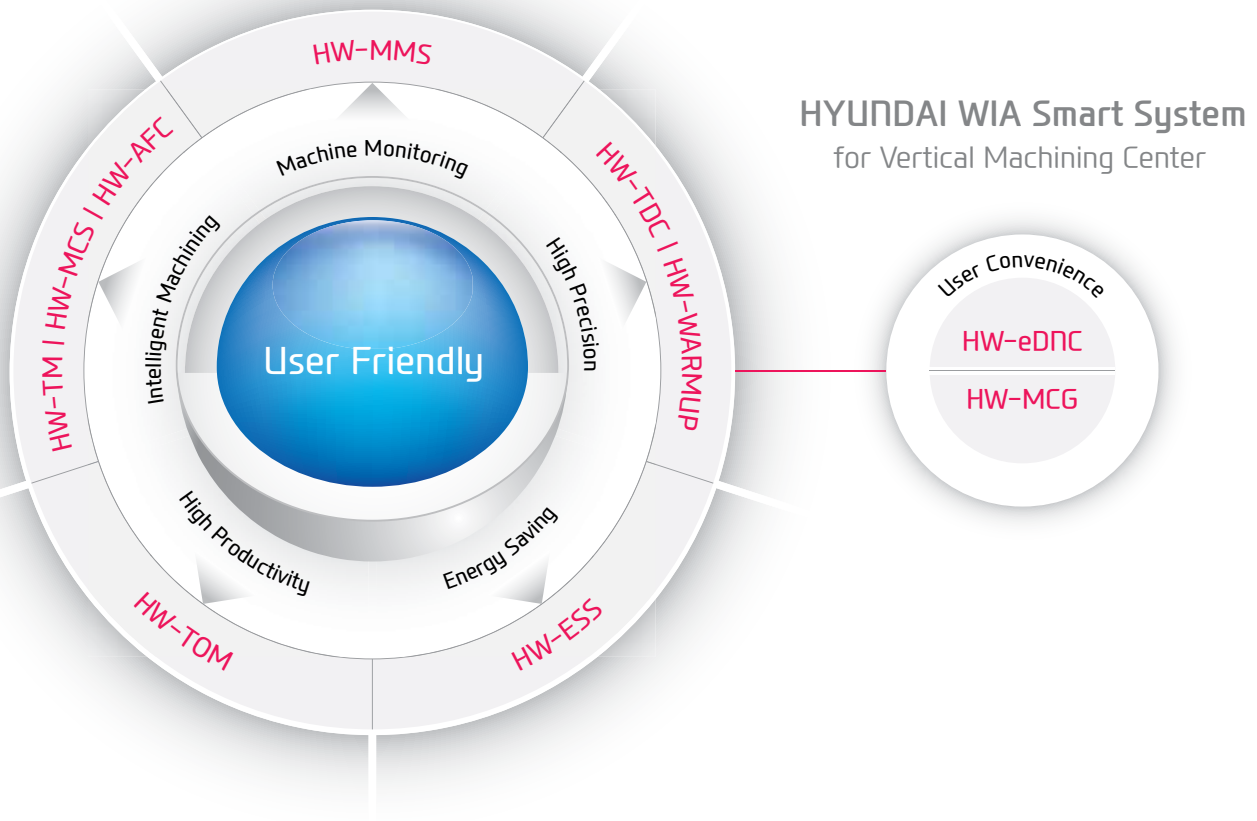
F750B/960B

## Smart System



Software for smart operating and machining

Faster processing and enhanced accuracy in are possible through the **HYUNDAI WIA Smart System**. The user friendly software and equipment monitoring of the Smart System maximizes productivity.



### Mold-related Software



#### HW-AFC

HYUNDAI WIA  
Adaptive Feed Control

(FANUC)



#### HW-MCS

HYUNDAI WIA  
Machining Condition Selection

(FANUC)

Software that controls the feed automatically to maintain a certain working load to extend tool life as well as productivity.

Software that automatically sets cutting and feeding parameters according to the machining types (speed, degree, quality)

## Smart Factory HW-MMS (HYUNDAI WIA-Machine Monitoring System)

A brand new manufacturing machine by HYUNDAI WIA, HW-MMS is a unique software capable of monitoring the operation status of manufacturing machines in factories, a smart solution to improve manufacturing conditions of customers.



- 01 Real-time monitoring of machine operation status (Cloud)
- 02 History and statistics of machine operation (Cloud)
- 03 History and statistics of alarm occurrence (Cloud)
- 04 History and statistics of work count (Cloud)
- 05 Remote diagnosis (Remote)



**HW-MCG** (FANUC)  
HYUNDAI WIA  
Machine Guidance

Software that offers operation, maintenance, management monitoring and various user friendly features.



**HW-TDC**  
HYUNDAI WIA Thermal  
Displacement Compensation

Software that measures the changes in the external environment as well as heat emission during processing to help reduce thermal displacement.



**HW-WARMUP** (FANUC)  
HYUNDAI WIA  
WARMing Up

Warm-up software that measures main spindle halt and offers system warm-up time automatically.



**HW-ESS** (FANUC)  
HYUNDAI WIA  
Energy Saving System

An environmental friendly software that reduces the unnecessarily wasted standby power waiting for an operation.



**HW-TOM**  
HYUNDAI WIA  
Tool Offset Measurement

User friendly GUI software that indicates tool length, diameter, and damage (H/W excluded)



**HW-TM**  
HYUNDAI WIA  
Tool Monitoring

A tool monitoring software which analyzes the load of the spindle motor to determine and monitor possible damage of tools.

# n6

F750B/960B

## SIEMENS Controller

The Powerful CNC platform for Machine Tools



# SIEMENS

**DIFFERENTIATED CAPABILITIES,  
INTEGRATED ENGINEERING PERFECTLY INTERLINKED**

SIEMENS 828D is a latest model CNC.

It is designed for horizontal/vertical all-purpose equipment.

Its 80-bit control reduces processing time and increases productivity.

The 828D is easy to maintain and run, with its easy setup functions.



## SIEMENS Technology

### Shop Mill

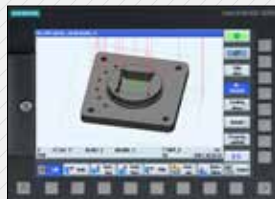
- Dialogue-type programming, simple and convenient
- Effective specifications for small quantity batch production
- Step-by-step operation possible without knowledge of the DIN/ISO code



OPTION

### 3D Simulation

- 3D confirmation of the completed processing configuration of the NC program is possible.
- Offers standards for 2D simulation.
- Possible to confirm the simulation of the NC program during processing.



OPTION

### Easy Extend

- Easy to install/uninstall an option (Ex : barfeeder and chip conveyor, etc.)
- Possible to install in one motion without revision of individual perimeters.
- A spate list is unnecessary as option items are indicated with letters.



## SIEMENS Communication

### Variable Communication Port

RJ 45 Ethernet

USB 2.0

Compact Flash Card



Easy input/output of a program is possible as a USB memory card, a CF memory card and LAN can all be used.

### ISO Code Programming



If the ISO Dialect (G291) is ordered, JIS-based G-code programs can be used. (Standard)

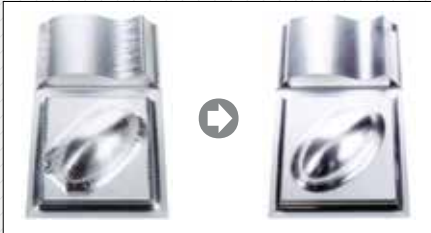
# 07

F750B/960B

## Mold Package



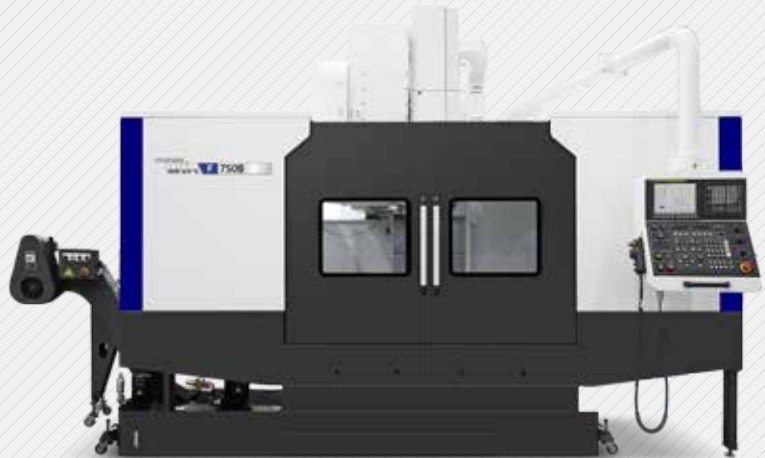
Powerful Mold Package,  
HYUNDAI-WIA Mold All in One



### HWM ALL-IN-ONE

To enhance mold machining, the "HWM ALL-IN-ONE" is provided as a standard feature for F750B/960B.

This ensures accurate and high quality surface finishing and contouring.



### Mold Package Specification (FANUC F31i-A / SIEMENS 828D)

HWM ALL IN ONE		1 Package (FANUC)	2 Package (FANUC)	3 Package (FANUC)	4 Package (FANUC)	5 Package (SIEMENS)
AICC II Package	200 block	●	●			
	600 block			●		
	1,000 block				●	
Mdynamic (Advanced surface)						●
S/W : HW-MCS, HW-AFC		●	●	●	●	
Auto Power Off		●	●	●	●	●
Spindle Heat Distortion Compensation Device (8 Channels)		●	●	●	●	●
Cutting Air Blow		●	●	●	●	●
Auto Tool Measuring Device		●	●	●	●	●
Data Server 1GB			●	●	●	



# Mold Package



- **High Speed Contouring Control (AICC II)**  
Recognizes NC Data prior to the current processing phase
- **Optimal S/W (FANUC 31i-B Model)**  
HW-MCS (Selectable Process Conditions)  
HW-AFC (Adaptive Feed Control)
- **Automatic Power Off**



- **Main Spindle Cooling Device (8-channel)**  
Maintains temperature on the main spindle from thermal displacement. (heat sensor)

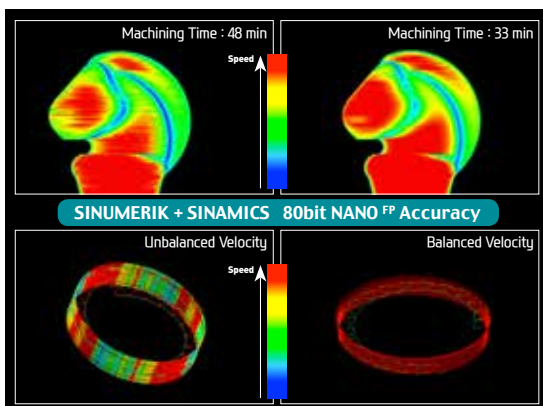


- **Cutting Air Blow**  
Cutting air blow is provided for mold machining.



- **Auto Tool Measuring Device**  
Detects and sets tool length, and attrition (Graphic User Interface included)

## SIEMENS Advanced Surface



- Advanced Surface software for high speed, high accuracy mold processing
- 80-bit floating point calculation enables calculation of numbers less than a nanometer
- A brand new filter for speed and acceleration control - Improvements upon the problems of intensity of illumination due to irregular CAM data
- Standard jerk restriction function to ease deceleration impact - Minimized vibration and high speed deceleration
- Standard feed forward function for speed control - Improves contouring accuracy by correcting the following error before setting point output

# SPECIFICATIONS

## Standard & Optional

Spindle		F750B	F960B
4,500rpm (18.5/15kW [24.8/20.1HP])	FANUC	●	-
4,500rpm (30/20kW [40.2/26.8HP])	SIEMENS	○	-
8,000rpm (18.5/15kW [24.8/20.1HP])	FANUC	○	-
8,000rpm (30/20kW [40.2/26.8HP])	SIEMENS	○	-
8,000rpm (22/18.5kW [29.5/24.8HP])	FANUC	-	●
8,000rpm (27.8/18.5kW [37.3/24.8HP])	SIEMENS	-	○
12,000rpm Built-in (30/25kW [40.2/33.5HP])	FANUC	○	○
Spindle Cooling System		●	●
<b>ATC</b>			
ATC Extension	20	●	●
	30	○	○
	40	-	○
Tool Shank Type	BBT50	●	●
	BT50	-	-
	CAT50	○	○
U-Center	D'andrea	○	○
Pull Stud	45°	●	●
	60°	○	○
	90°	○	○
<b>Table &amp; Column</b>			
APC	Rorary Turn	-	-
Tap Type Pallet		-	-
T-Slot Pallet		●	●
NC Rotary Table		☆	☆
High Column	250mm(9.8")	○	-
	200mm(7.8")	-	○
<b>Coolant System</b>			
Std. Coolant (Nozzle)		●	●
Bed Flushing Coolant		●	●
Through spindle coolant*	20bar (290 psi)	○	○
	30bar (435 psi), 20 ℓ (5.3 gal)	○	○
	70bar (1,015 psi), 15 ℓ (4 gal)	○	○
	70bar (1,015 psi), 30 ℓ (7.9 gal)	○	○
Top Cover (Thru coolant applied when necessary)		○	○
Shower Coolant		○	○
Gun Coolant		○	○
Side Oil Hole Coolant		○	○
Air Gun		○	○
Cutting Air Blow		○	○
Tool Measuring Air Blow (Only for TLM)		○	○
Air Blow for Automation		☆	☆
Thru MQL Device (Without MQL)		☆	☆
Coolant Chiller		☆	☆
Power Coolant System (For Automation)		☆	☆
<b>Chip Disposal</b>			
Coolant Tank	470 ℓ (124.2 gal)	●	-
	690 ℓ (182.3 gal)	-	●
Interior Screw Chip Conveyor		●	●
Exterior Screw Chip Conveyor		●	-
Chip Conveyor (Hinge/Scraper)	Rear(Right)	○	-
	Left(Rear)	○	-
	Front(Left)	-	○
Chip Conveyor (Hinge)	Front(Right)	-	○
Special Chip Conveyor (Drum Filter)		☆	☆
	Standard (180 ℓ [47.5 gal])	○	○
Chip Wagon	Swing (200 ℓ [52.8 gal])	☆	☆
	Large Swing (290 ℓ [76.6 gal])	☆	☆
	Large Size (330 ℓ [87.2 gal])	☆	☆
	Customized	☆	☆

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

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

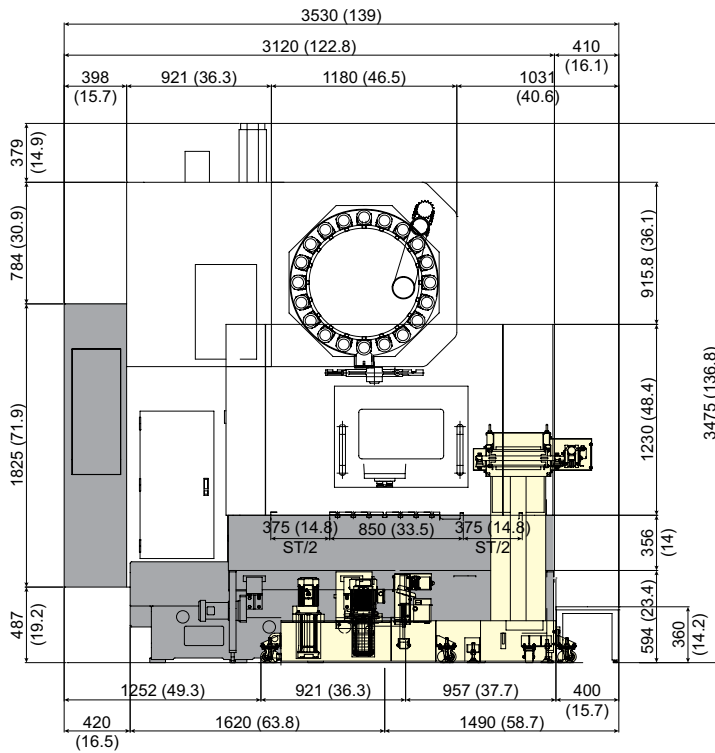
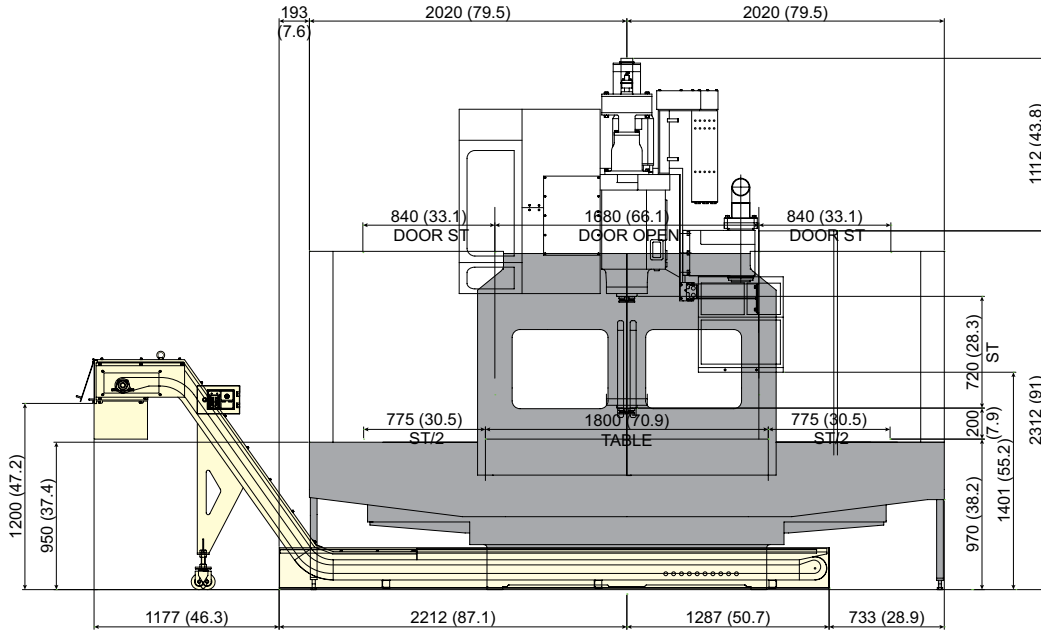
S/W		F750B	F960B
Machine guidance (HW-MCG) : FANUC/SIEMENS		☆/-	☆/-
Tool Monitoring (HW-TM)		○	○
DNC Software (HW-eDNC)		○	○
Spindle Heat Distortion Compensation (HW-TDC)		☆	☆
Spindle Warm up Function (HW-WARMUP) : FANUC/SIEMENS		☆/-	☆/-
Energy Saving System (HW-ESS) : FANUC/SIEMENS		☆/-	☆/-
Machine Monitoring System (HW-MMS)		○	○
Tool Offset Measurement (HW-TOM)		☆	☆
Machining Condition Selection (HW-MCS) : FANUC/SIEMENS		☆/-	☆/-
Adaptive Feed Control (HW-AFC) : FANUC/SIEMENS		☆/-	☆/-
Conversational Program (HW-DPRO)		○	○
<b>Electric Device</b>			
Call Light	1 Color : ■	●	●
Call Light	2 Color : ■ ■	○	○
Call Light	3 Color : ■ ■ ■	○	○
Call Light & Buzzer	3 Color : ■ ■ ■ B	○	○
Work Light		●	●
Electric Cabinet Light		○	○
Remote MPG		●	●
3 Axis MPG	FANUC	○	○
	SIEMENS	-	-
Work Counter	Digital	○	○
Total Counter	Digital	○	○
Tool Counter	Digital	○	○
Multi Tool Counter	6 EA	○	○
	9 EA	○	○
Electric Circuit Breaker		○	○
AVR (Auto Voltage Regulator)		☆	☆
Transformer	40kVA	○	-
	45kVA	-	○
Auto Power Off		●	●
Back up Module for Black out		○	○
<b>Measuring Device</b>			
Air Zero	TACO	○	○
	SMC	○	○
Work Measuring Device		○	○
TLM (Marposs/Renishaw/Blum)	Touch	○	○
	Laser	○	○
Tool Broken Detective Device		☆	☆
Linear Scale	X/Y/Z Axis	○	○
Coolant Level Sensor (Only for Chip Conveyor, Bladder Type)		☆	☆
<b>Enviornment</b>			
Air Conditioner		○	○
Dehumidifier		○	○
Oil Mist Collector		☆	☆
Oil Skimmer (Only for Chip Conveyor)		○	○
MQL (Minimal Quantity Lubrication)		☆	☆
<b>Fixture &amp; Automation</b>			
Auto Door	Std.	○	○
	High Speed	☆	☆
Auto Shutter (Only for Automatic System)		-	-
Sub O/P		☆	☆
NC Rotary Table/F	Single	○	○
	Channel	☆	☆
Control of Additional Axis	1Axis	○	○
	2Axis	☆	☆
External M Code 4ea		○	○
Automation Interface		☆	☆
I/O Extension (In & Out)	16 Contact	○	○
	32 Contact	○	○
<b>Hyd. Device</b>			
Std. Hyd. Unit	70bar (1,015 psi) / 13 ℓ (3.4 gal)	-	-
	45bar (652.7 psi)	○	○
Fixture Hyd. Unit	70bar (1,015 psi)	○	○
	100bar (1,450 psi)	☆	☆
	Customized	☆	☆
<b>ETC</b>			
Tool Box		●	●
Customized Color	Need for Munsel No.	☆	☆
CAD&CAM Software		☆	☆

# SPECIFICATIONS

## External Dimensions

unit : mm(in)

### F750B

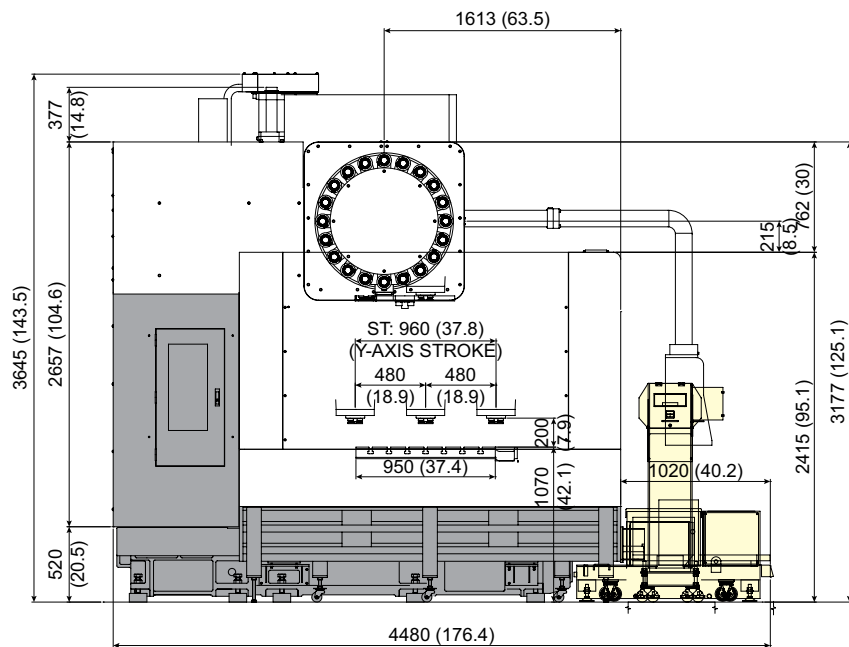
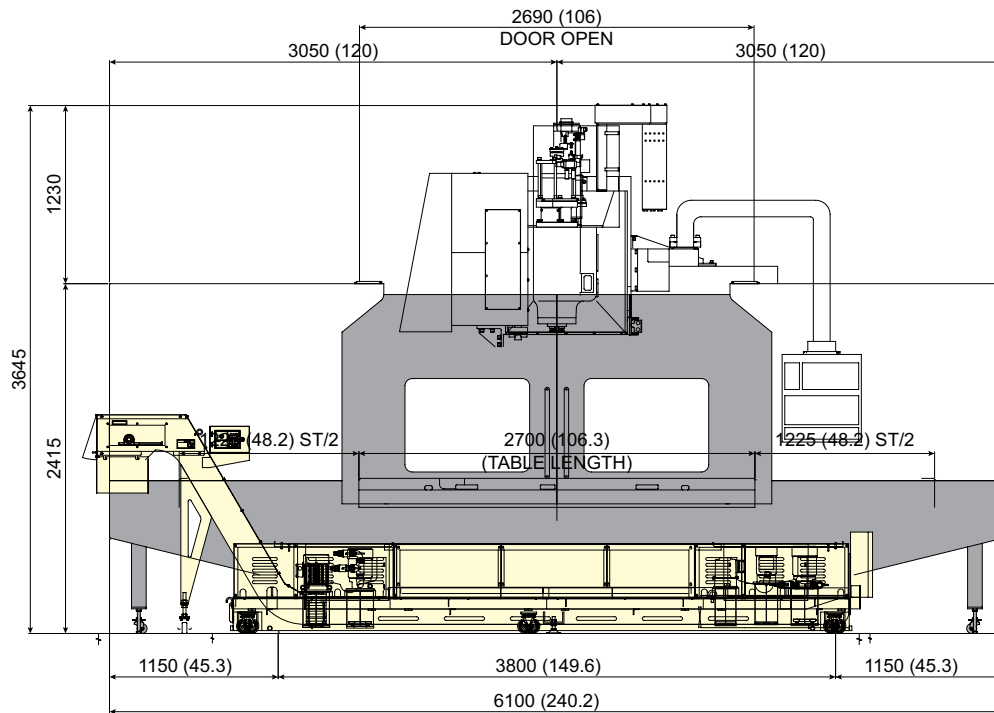


# SPECIFICATIONS

## External Dimensions

unit : mm(in)

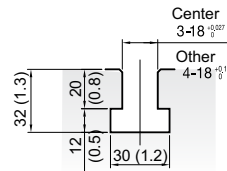
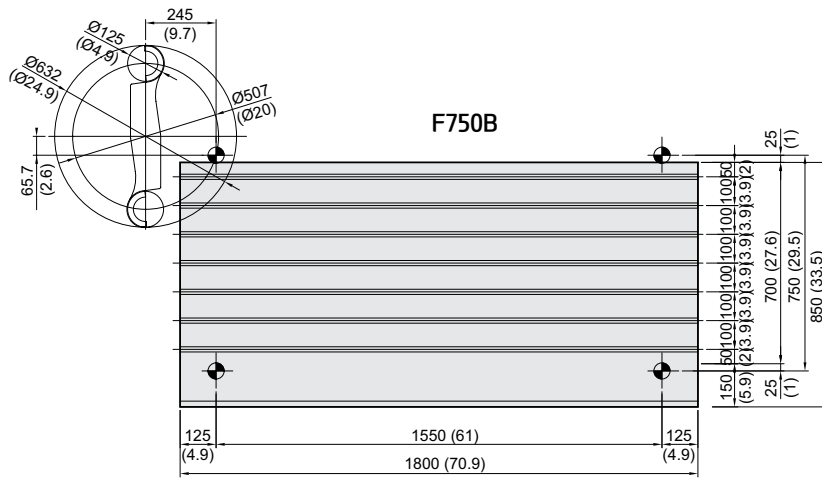
### F960B



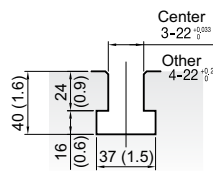
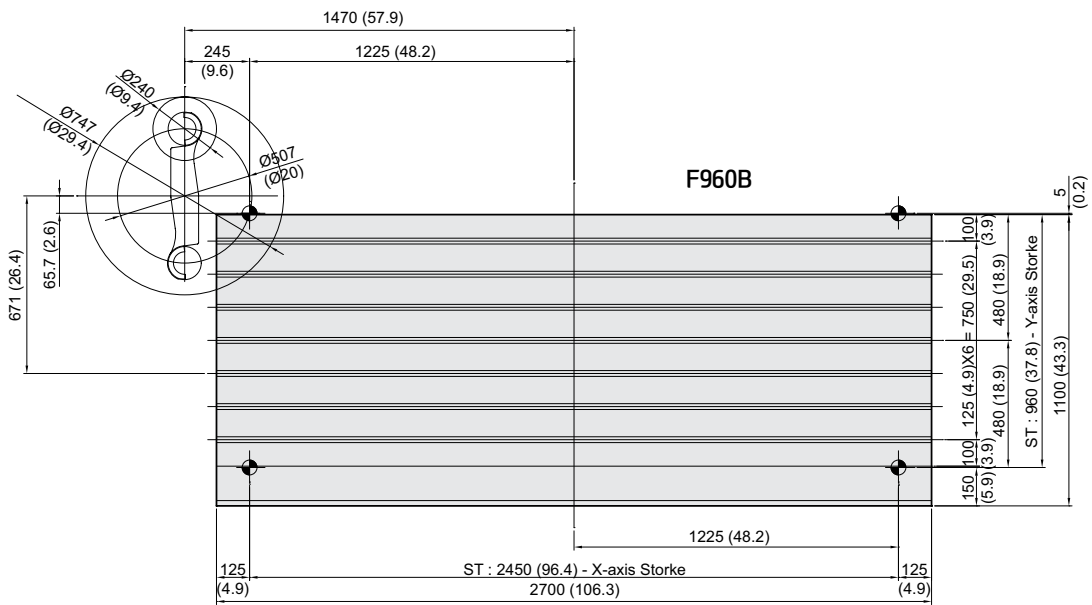
# SPECIFICATIONS

## Table Dimensions

unit : mm(in)



T-Slot Detail



T-Slot Detail

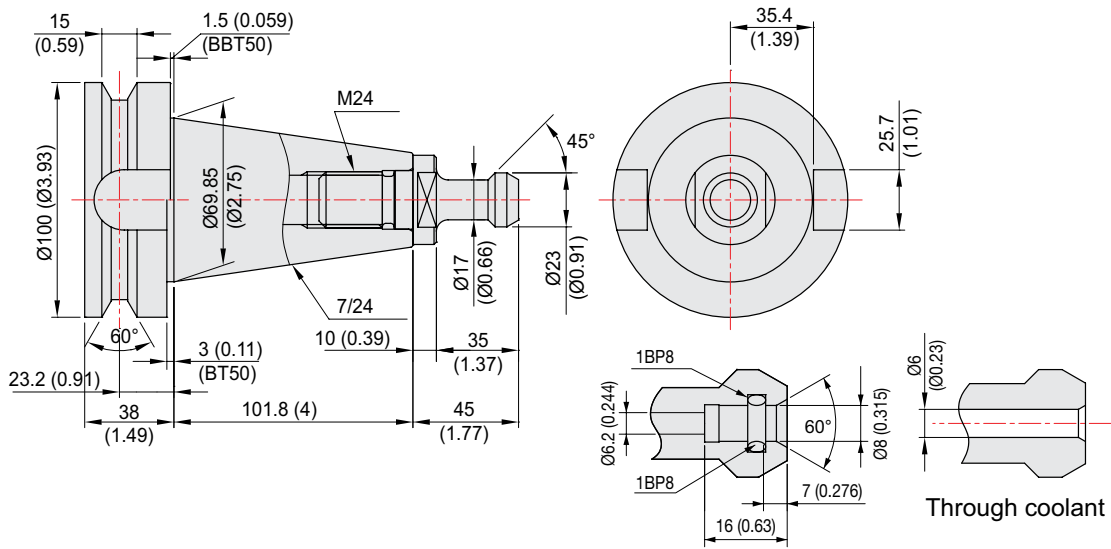


# SPECIFICATIONS

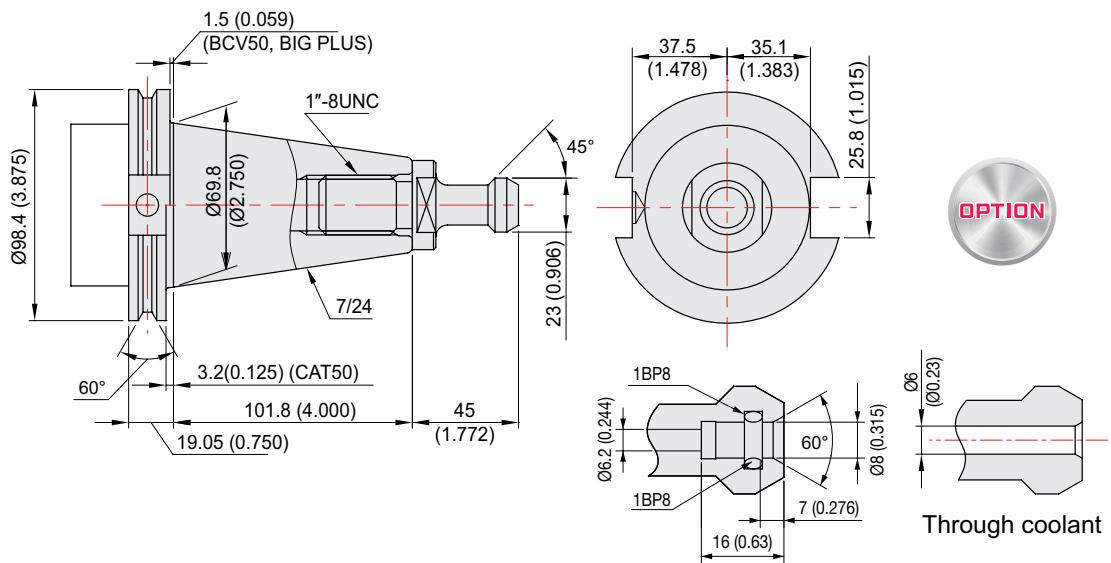
Tool Shank

unit : mm(in)

## BT50/BBT50, BIG PLUS



## CAT-50/BCV50



# SPECIFICATIONS

## Specifications

[ ] : Option

ITEM		F750B	F960B	
TABLE	Table Size	mm(in)	1,800x700 (70.9"×27.6")	2,700x950 (106.3"×37.4")
	Maximum Load Capacity	kg(lb)	2,000 (4,409)	4,500 (9,921)
SPINDLE	Spindle Taper	-	Big Plus #50	
	Spindle RPM	r/min	4,500 [8,000] [12,000] [4,500] [8,000]	8,000 [12,000] [8,000]
	Spindle Power Output (Max./Cont.)	kw(HP)	18.5/15 (24.8/20.1) [18.5/15 (24.8/20.1)] [30/25 (40.2/33.5)] [30/20 (40.2/26.8)] [30/20 (40.2/26.8)]	22/18.5 (29.5/24.8) [30/25 (40.2/33.5)] [27.8/18.5 (37.3/24.8)]
	Spindle Torque (Max./Cont.)	N·m(lbf·ft)	893/732 (658.6/539.9) [657/532 (464.6/392.4)] [420/238 (309.8/175.5)] [1,449/966 (1,068.7/712.5)] [1,058/704 (780.3/519.2)]	776/657 (572.3/484.6) [420/238 (309.8/175.5)] [1,316/877 (970.6/646.8)]
	Spindle Driving Method	-	GEAR [GEAR] [BUILT-IN] [GEAR] [GEAR]	GEAR [BUILT-IN] [GEAR]
FEED	Travel (X/Y/Z)	mm(in)	1,550/750/720 (61"/29.5"/28.3")	2,450/960/850 (96.5"/37.8"/33.5")
	Distance from Table Surface to SP	mm(in)	200 ~ 920 (7.9" ~ 36.2") [450~1,170 (17.7" ~ 46.1")]	200 ~ 1,050 (7.8" ~ 41.3") [450~1,250 (17.7"~49.2")]
	Distance from Column to SP. center	mm(in)	790 (31.1")	1,000 (39.3")
	Rapid Traverse Rate (X/Y/Z)	m/min(ipm)	16/16/12 (630/630/472)	16/16/20 (630/630/787)
	Slide Type	-	BOX GUIDE	
ATC	Number of Tools	EA	20 [30]	20 [30, 40]
	Tool Shank	-	BBT50 [CAT50]	
	Max. Tool Dia. (W.T / W.O)	mm(in)	Ø125/Ø240 (Ø4.9"/Ø9.4")	
	Max. Tool Length	mm(in)	300 (11.8")	
	Max. Tool Weight	kg(lb)	20 (44.1)	
	Tool Selection Method	-	RANDOM	
	Tool Change Time	T-T	sec	4
C-C		sec	8.5	
TANK CAPACITY	Coolant Tank	ℓ (gal)	470 (124.2)	690 (182.3)
	Lubricating Tank	ℓ (gal)	3.1 (0.8)	4.4 (1.1)
POWER SUPPLY	Air Consumption (0.5MPa)	ℓ /min(gal)	250 (66)	
	Electric Power Supply	kVA	35	40
	Thickness of Power Cable	Sq	Over 25	Over 50
	Voltage	V/Hz	220/60 (200/50*)	
MACHINE	Floor Space (L×W)	mm(in)	4,040×3,530 (159"×139")	6,100×4,480 (240.2"×176.4")
	Height	mm(in)	3,475 (136.8")	3,645 (143.5")
	Weight	kg(lb)	13,000 (28,660)	23,500 (51,809)
PC	Controller	-	FANUC 31i-B [HYUNDAI WIA FANUC i Series] [SIEMENS 828D]	

\*) Using 50Hz voltage instead of 60Hz may lower the output of motors. (excluding servo motors and inverter motors)  
Specifications are subject to change without notice for improvement.

# CONTROLLER

## HYUNDAI WIA FANUC i Series

Controlled axis / Display / Accuracy Compensation	
Controlled axis	3 axis (X, Y, Z)
Simultaneous controllable axis	3 axis (G00 & G01 : 3 axis, G02 & G03 : 2 axis)
Least input increment	X, Y, Z축: 0.001 mm (0.0001")
Least command increment	X, Y, Z축: 0.001 mm (0.0001")
Inch/Metric conversion	G20 / G21
Interlock	Each axis / All axis
Machine lock	All axis
Emergency stop	
Stored stroke check 1	Over Travel
Stored stroke check 2	
Stored stroke check 3	
Follow-up	
Servo off	
Backlash compensation	+/- 0~9999 pulse (rapid traverse & cutting feed)
Position switch	
Stored pitch error compensation	
LCD/MDI	8.4" color LCD
Operation	
Automatic operation (memory)	
MDI operation	
DNC operation	Need DNC Program
Search function	Sequence, Program
Program restart	
Wrong operation prevention	
Buffer register	
Program check function	Dry run, program check
Single block	
Handle interrupt	
Feed functions	
Manual jog feed	Rapid, Jog, handle
Manual handle feed-rate	x1, x10, x100
Feed command	F code feedrate direct command
Feedrate override	0~200% (10% Unit)
Jog feed	0~5,000 mm/min (197 ipm)
Rapid traverse override	F1, F25%, F50%, F100%
Override cancel	
Rapid traverse bell-shaped acceleration/ deceleration	
Auto corner override	G62
Program input & Interpolation functions	
Label Skip	
Control in/out	
Nano Interpolation	Positioning/Linear/Circular (G00/G01/G02/G03)
Exact stop mode/Exact stop	G61 / G09
Dwell	G04, 0~9999.9999sec
Helical interpolation	
Threading/synchronous feed	G33
Manual reference point return	
Reference point return	G28
Reference point return check	G27
2nd, 3rd, 4th Reference point return	G30
Program stop/end	M00, M01 / M02, M30
Tape code	EIA RS-244/ISO 840 (Automatic recognition)
Optional block skip	1 EA
Max. programmable dimensions	+/- 9999.9999 (+/- 8 digits)
Program number	04 /N8
Absolute/incremental command	G90 / G91
Decimal point input	
Plane selection	G17, G18, G19
Work coordinate system setting	G52~G59
Work coordinate preset	G50.3
Additional work coordinate system	G54.1 P1 ~P48 (48 pairs)
Manual absolute	"On" fixed
Programmable data input	G10

Program input & Interpolation functions	
Sub program call	10 folds nested
Custom macro	
Addition to custom macro common variables	#100 ~ #199, #500 ~ #999
Cylindrical interpolation	G02, G03
Canned cycle	G73, G74, G76, G80 ~ G89
Optional chamfering/corner R	
Skip function	G31
High speed Skip function	
Automatic coordinate system setting	
Coordinate system rotation	G68, G69
Programmable mirror image	G50.1, G51.1
Single direction positioning	G60
External data input	Tool offset, message, machine zero point shift
Cylindrical interpolation	
AI advanced preview control	G5.1 (20 Block look ahead)
Polar coordinate command	G15, G16
Sub / Spindle functions	
Miscellaneous function	M3 digits
Miscellaneous function lock	
Spindle speed command	55 digits, binary output
Spindle speed override	50%~120% (10% unit)
Spindle orientation	
Rigid tapping	
Tool functions / Tool compensation	
Tool function	Max. T8 digits
Cutter compensation C	G40~G42
Tool length measurement	Z Axis INPUT C
Tool length compensation	G43, G44, G49
Tool offset amount	G45~G48 (+/- 6 digits)
Tool offset pairs	400 pairs
Tool life management	
Data input / Output & Editing functions	
Reader/Puncher interface	RS232C
Memory card input/output	
USB input/output	
Embedded Ethernet	100Mbps
Part program storage length	1280m (512 Kbyte)
Registered programs	400 ea
Memory lock	
Back ground editing	
Extended part program editing	Copy, move, change of NC program
Setting, display, diagnosis	
Self-diagnosis function	
History display	Alarm & operator message
Help function	
Run hour/Parts count display	
Actual cutting feedrate display	
Spindle/Servo setting screen	
Multi-language display	Selection of 5 optional language
Dynamic switching display language	
LCD Screen Save	Screen saver
Option	
Sub Axis Control	4, 5 Axis
wo way pitch error compensation	
Manual Guide Oi	8.4" color LCD
Manual Guide i	10.4" color LCD (Conversational Program)
Dynamic graphic display	
Optional block skip add	9 ea (Application can be limited)
AI contour control(AICC)	40 Block look ahead
AI contour control(AICC) II	200 Block look ahead
Nano Smoothing	
Tool Management Function	
Protection of data at 8 levels	
Data server	1GB
FAS Ethernet	100 Mbps (Option board is required)
Part program storage length Expand	5120m (2 Mbyte)

Figures in inch are converted from metric values.

The FANUC controller specifications are subject to change based on the policy of company CNC supplying.

# CONTROLLER

## FANUC 31i-B

[ ] : Option ☆ Needed technical consultation

Controlled axis / Display / Accuracy Compensation	
Control axes	3 axes (X, Y, Z) 4 axes (X, Y, Z, B)
Simultaneously controlled axes	3 axes [Max. 4 axes]
Least setting Unit	X, Y, Z axes : 0.001 mm (0.0001 inch)
	B axes : 1 deg [0.001] deg
Least input increment	X, Y, Z axes : 0.001 mm (0.0001 inch)
	B axes : 1 deg [0.001] deg
Inch / Metric conversion	G20 / G21
High response vector control	
Interlock	All axes / Each axis
Machine lock	All axes
Backlash compensation	± 0 ~ 9999 pulses (Rapid traverse / Cutting feed)
Position switch	
LCD / MDI	10.4 inch color LCD
Feedback	Absolute motor feedback
Stored stroke check 1	Over travel
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 axes Machine lock, Stroke check before move
Single block	
Search function	Program Number / Sequence Number
Interpolation functions	
Pano interpolation	
Positioning	G00
Linear interpolation	G01
Cylindrical 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, G27
	Ref. position check, G30
Thread synchronous cutting	G33
Helical interpolation	Circular + Linear interpolation 2 axes(max.)
Feed function / Acc. & Dec. control	
Manual feed	Rapid traverse
	Jog : 0~5,000mm/min (197 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	F0% (F1%), F25%, F50%, F100%
Override cancel	
Feed per minute	G94
Feed per revolution	G95
Look-ahead block	40 Block
	200 Block (Mold)
Program input	
Tape Code	EIA / ISO
Optional block skip	1 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, 6 pairs (G54 ~ G59)
Manual absolute	Fixed ON
Programmable data input	G10
Sub program call	10 folds nested
Custom macro	#100 ~ #149, #500 ~ #549
G code system	A
Programmable mirror image	G51.1, G50.1
G code preventing buffering	G4.1
Including Chamfering / Corner R	
Canned cycle	G73, G74, G76, G80 ~ G89
Coordinate rotation	G68, G69

Auxiliary function / Spindle speed function	
Auxiliary function	M & 4 digit
Level-up M Code	Multi / Bypass M code
Spindle speed command	S & 5 digit, Binary output
Spindle override	0% ~ 150% (10% Unit)
Spindle orientation	M19
FSSB high speed rigid tapping	
Tool function / Tool compensation	
Tool function	Max. T 8 digit
Tool life management	256 pairs ☆
Tool offset pairs	64 pairs
Tool nose radius compensation	G40, G41, G42
Tool nose length compensation	G43, G44, G49
Tool offset memory C	Tool length, diameter, abrasion(length, diameter)
Tool length measurement	Z axes Input C
Editing function	
Part program storage size	640m (256KB)
No. of registerable programs	500 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	RS 232C serial port, 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	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 20 languages
Display language switching	Selection of 5 optional Languages
LCD Screen Saver	Screen saver
Processing select	Speed/rigidity setting
Option	
Additional optional block skip	9 ea ☆
Fast ethernet	Needed option board
Data server	Needed option board
Protection of data at 8 levels	
Sub Spindle control	
Polar coordinate command	G15, G16
Polar coordinate interpolation	G12.1, G13.1
Cylindrical interpolation	G07.1
One-way positioning	G60
Stored stroke check 2, 3	
Inverse-time feed	G93
Scaling	G50, G51
Manual guide i	Conversational auto program
Handle interrupt	
Manual handle feed	2/3 units
Additional custom macro variables	#100~#199, #500~#999 #100~#199, #500~#999, #98000~#98499
Retraction for rigid tapping	
Tool management function	
Tool offset number	Max. 2000 pair ☆
Program storage capacity	512KB ~ 8MB ☆
Program registration number	Max. 4000 ea ☆
Additional work coordinate	48 pair (G54.1 P1 ~ P48)
AICC II	200 block 400 / 600 / 1000 block ☆

Figures in inch are converted from metric values.

The FANUC controller specifications are subject to change based on the policy of company CNC supplying.

# CONTROLLER

## SIEMENS 828D

Control Function	
Max. configuration of axis	5 axis
Max. configuration of axis and spindle	6 axis (axis + spindle)
Least Command/Input	0.0001mm / 0.00001inch
Feed Function	
Feedrate Override	0 - 120%
Rapid Traverse Override	F0, 5, 25/50, 100%
Acceleration with jerk limitation	
Programmable acceleration	
Follow-up mode	
Measuring system 1 and 2, selectable	
Separate path feed for corners and chamfers	
Travel to fixed stop	
Spindle Functions	
Spindle Override	50% - 120%
Spindle Orientation	
Spindle Speed Limitation	
Rigid Tapping	
Interpolations	
Linear interpolation axis	Max 4 axis
Circle via center point and end point	
Circle via interpolation point	
Helical interpolation	
Universal interpolator NURBS (non-uniform rational B splines)	
Advanced Surface	High Speed, High Rigidity Function
Compressor for 3-axis machining	
Tool Function	
Tool Radius Comp.	
Zero Offset (G54, G55, G56, G57, G58, G59)	100 EA
Programmable Zero Offset	
3D Tool Radius Compensation	
Tool management	
Display	
CRT / MDI	10.4" Color LCD
Screen saver	
Manual Operation	
Manual Handle/Jog Feed	
Reposition	
Reference Approach	Ref 1, 2 Approach
Spindle Control	Start, Stop, Rev, Jog, Ort.
Auto Operation	
Single Block	
Feed Hold	
Optional Block Skip	
Machine Lock	
Dry Run	
Simulation	2D
Diagnosis Function	
Alarm display	
Spindle Load Meter/RPM Meter (monitor)	
PLC status/LAD display	

Programming Function	
Part Program Storage Length	5MB
Program Name	23 digits
Subroutine Call	Protection Level
Absolute/Incremental Command	G90 - G91
Scaling, ROT	
Inch / Metric Conversion	
Conversational Cycle Program	
Block Search	
Variable Program (Macro)	
Read / Write System Variable	
BackGround Editing	
Miscellaneous Functions	M - Code
Label Skip	
Program Stop / End	M00, M01, M02, M30
Lookahead, Jerk Limitation Feed & Forward Control	150 Block
SIEMENS Program exe.	
Maximum number of tools/cuttings	256/512
Number of levels for skip blocks 1	
Protection Function	
Emergency Stop	
Over Travel	Soft Limit
Contour Monitoring	
Program Protection	
Automation Support Fun.	
Actual Speed Display(Monitor)	
Tool Life Management	(Time, Parts)
Work Count Function	(Internal)
Language Function	
	(6EA)
Two Language switchable	Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Russian, Swedish, Portuguese, Turkish
Data Transfer	
RS 232C I/F / Ethernet	
Ethernet	
USB Memory Stick & CF Card	
Option	
DRF offset	
Load and save of MDI	
Teach-in	
Number of levels for skip blocks 8	
Simulation in 3D display	
Shop Turn	Conversational Program
TRACYL	
TRANSMIT	

Figures in inch are converted from metric values.

The SIEMENS controller specifications are subject to change based on the policy of company CNC supplying.

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