

FD Series

HYUNDAI WIA Column Moving Type Vertical Machining Center



Technical Leader

The Vertical Machining Center FD Series designed by Hyundai WIA with years of expertise and the latest technology, is a column moving type machining center equipped with Dual Table to maximize productivity.



MODEL	Y-Axis Stroke			Spindle rpm			Taper	Magazine	
	410mm(16.1")	460mm(18.1")	600mm(23.6")	8,000	10,000	12,000	BT40	24 TOOL	30 TOOL
F410D	●			○	●		●	●	
F500D		●		●	○	○	●	●	○
F600D			●	●		○	●	●	○

●: Standard ○: Option

High productivity Dual Table equipped
High tech column moving Machining Center

FD Series

- High precision main spindle designed with P4 Angular Contact Ball Bearings
- High power/torque main spindle for heavy duty cutting
- Dual Tables for enhanced productivity
- Latest Servo ATC for the fastest tool change time in the class
- Combination of Roller Type LM Guide and Box Guide for optimal feed (F500D)
- Roller Type LM Guide on all axes for high precision heavy cutting (F600D)
- Latest SIEMENS 828D Controller with wide range of support software





F410D Basic Features

High Speed & Productivity Vertical Machining Center

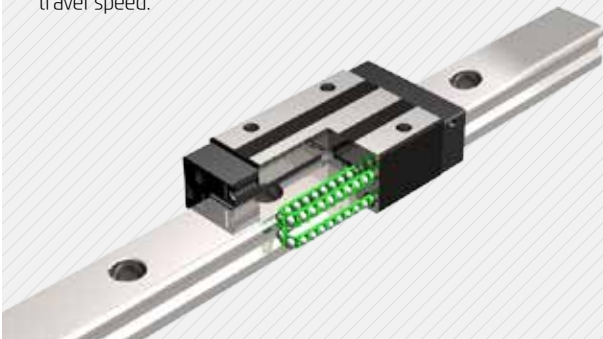
01

Moving Column

The F410D is designed with a moving column in order to maximize productivity of the incorporated Dual Table. In addition, due to the enlargement of the column's width and symmetrical heat behavior column structure, heat displacement is minimized and machining accuracy is increased.

LM Guideway

F410D Ball Type LM Guide provides reduction of noise while in motion, and reduction of non-cutting time due to superior travel speed.

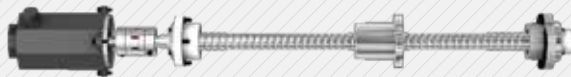


02

Double Anchored Ball screw

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

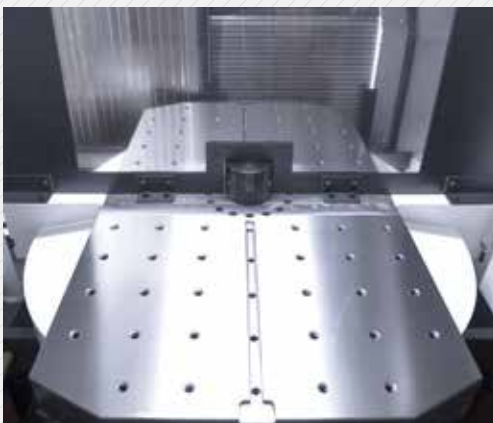
The double anchored and pretensioned design provides outstanding positioning and repeatability with virtually no thermal growth.



03

Directly Coupled Servo Motor

Each axis is directly connected to a highly reliable digital servo motor to provide high rigidity and minimal thermal displacement.

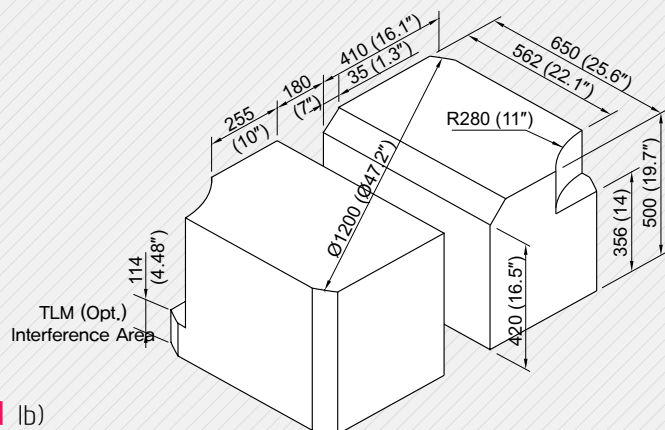


Dual Table

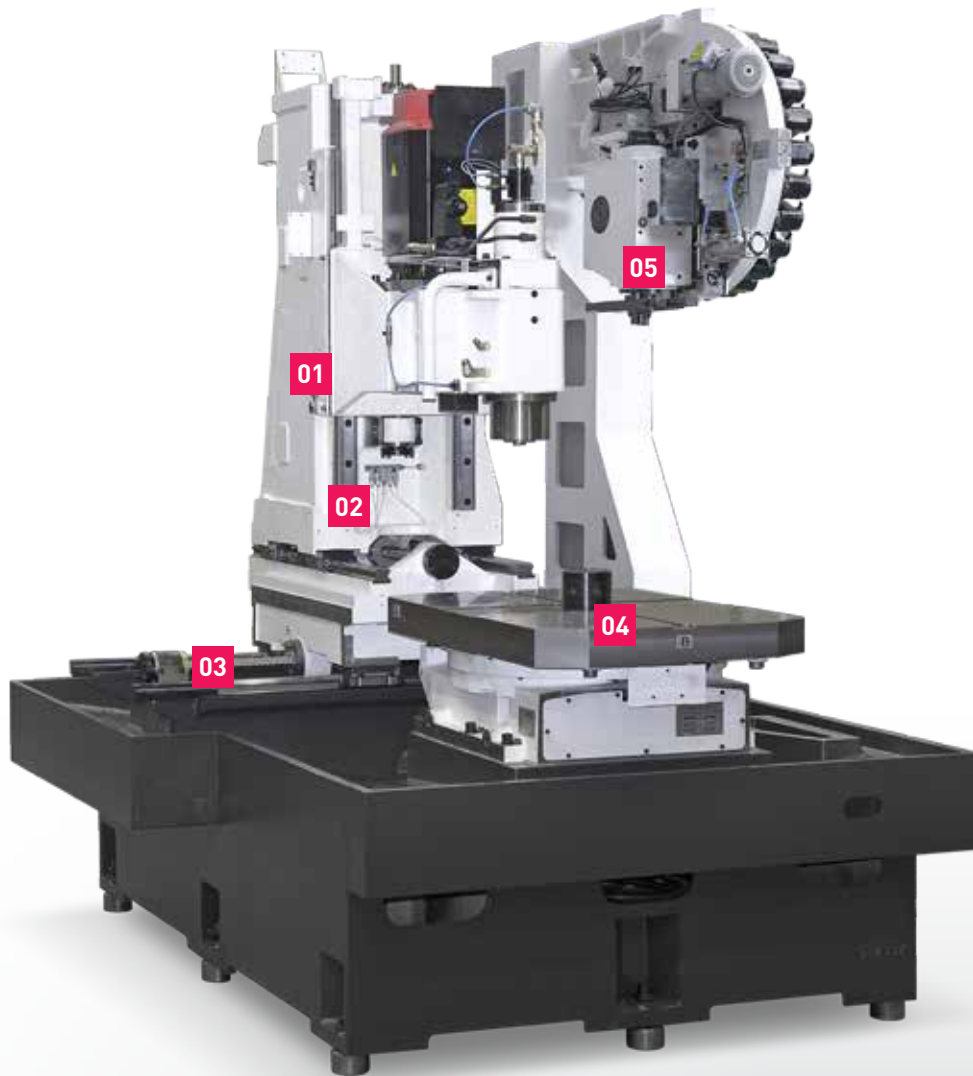
High speed 180° index rotating table increases productivity by providing the ability to load and unload on the outer table while processing on the other table.

04

- **Table Size** (L×W) : **2-560×410** mm
(2-22"×16.1")
- **Max. Load Capacity** : **2-250** kg (2-551 lb)
- **Table Change Time** : **5.2** sec



Basic Features



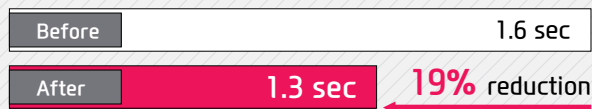
HYUNDAI WIA
MACHINE TOOL

FD SERIES
Vertical Machining Center

04
+
05

05 ATC Speed Improvement

Tool to Tool Time



Chip to Chip Time



- ⊙ **Rapid Traverse Rate** (X/Y/Z axis) :
 36/36/30 m/min (1,417/1,417/1,181 ipm)
- ⊙ **Spindle Speed** : 10,000 Belt [10,000 Belt] rpm
- ⊙ **Spindle Output** (Max./Cont.) :
 18.5/15 [22.5/15] kW (24.8/20 [30.2/20] HP)
- ⊙ **Travel** (X/Y/Z axis) :
 570/410/580 mm (22.4"/16.1"/22.8")
- ⊙ **Spindle Torque** (Max./Cont.) :
 117.7/95.4 [189/126] N·m
 (86.8/70.4 [139.4/92.9] lbf·ft)

02

FD Series

F500D Basic Features

High Speed & Productivity Vertical Machining Center

01

Moving Column

The F500D is designed with a moving column in order to maximize productivity of the incorporated Dual table. In addition, due to the enlargement of the column's width and symmetrical heat behavior column structure, heat displacement is minimized and machining accuracy is increased.

Hybrid Type Slideway

Each axis on F500D is designed with slideways optimized to the axis. Sturdy **Box Guide** on Z-axis for heavy loads, and **Roller Type LM Guides** on X and Y axis for optimal travel ability.



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



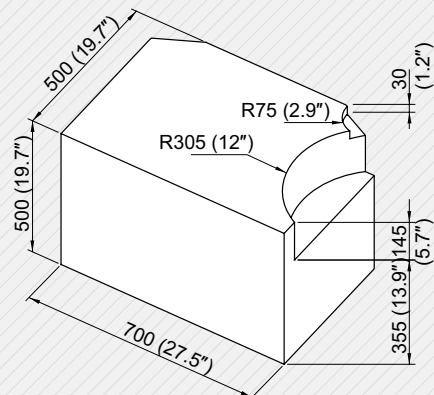
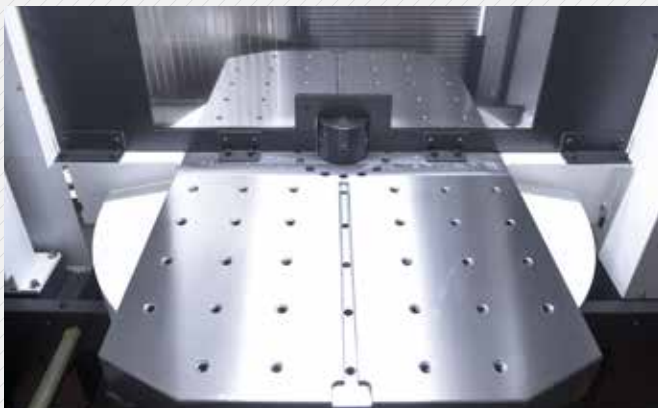
03

Directly Coupled Servo Motor

Each axis is directly connected to a highly reliable digital servo motor to provide high rigidity and minimal thermal displacement.

Dual Table

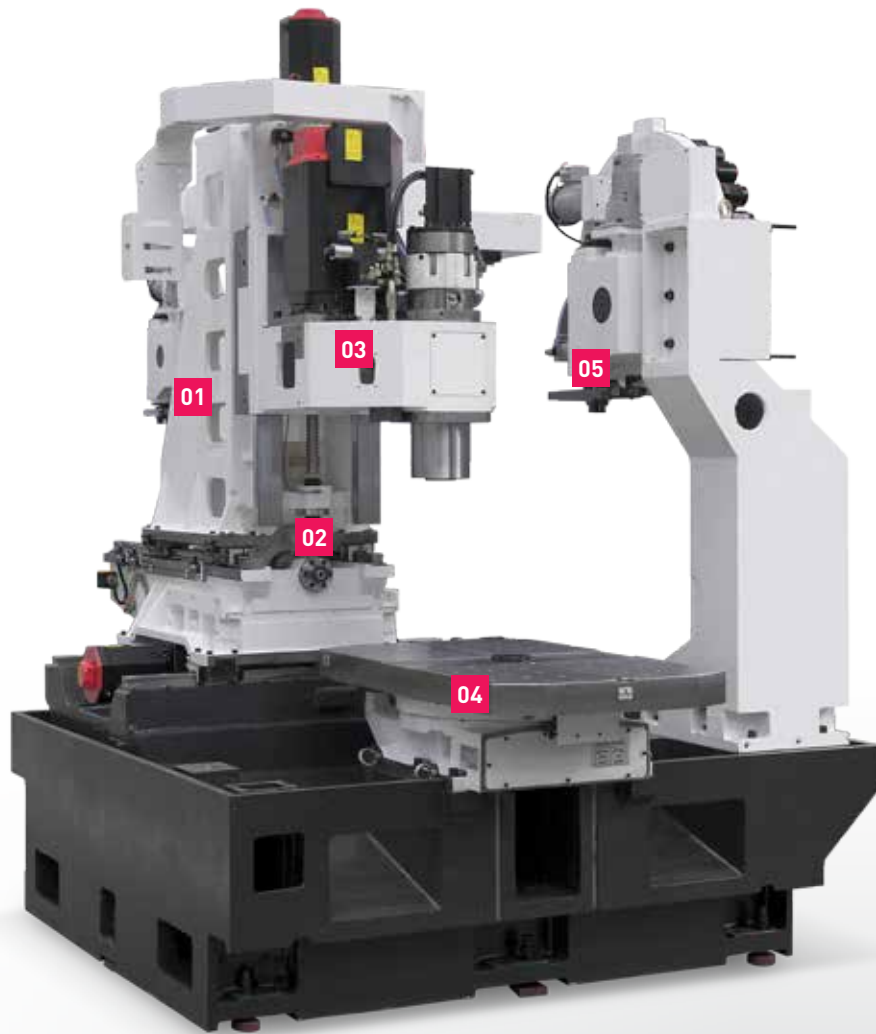
High speed 180° index rotating table increases productivity by providing the ability to load and unload on the outer table while processing on the other table.



04

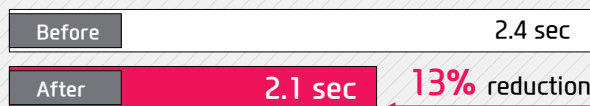
- **Table Size (LxW) :** 2-700x500 mm (2-27.5"x19.7")
- **Max. Load Capacity :** 2-350 kg (2-771.6 lb)
- **Table Change Time :** 6 sec

Basic Features

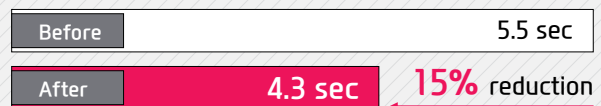


05 ATC Speed Improvement

Tool to Tool Time



Chip to Chip Time



- ⊙ **Rapid Traverse Rate** (X/Y/Z axis) : 40/40/30 m/min (1,575/1,575/1,181 ipm)
- ⊙ **Travel** (X/Y/Z axis) : 600/460/570 mm (23.6"/18.1"/22.4")
- ⊙ **Spindle Speed** : 8,000 Belt [10,000 Belt] [12,000 Direct] [8,000 Belt] rpm
- ⊙ **Spindle Output** (Max./Cont.) : 15/11[15/11][11/7.5][17] kW (20/15[20/15][15/10] [22.8] kHP)
- ⊙ **Spindle Torque** (Max./Cont.) : 287/143 [230/115] [70/47] [286] N·m
(211.7/105.5 [170/84.8] [51.6/36.7] [210.9] lbf·ft)

03

FD Series

F600D Basic Features

High Speed & Productivity Vertical Machining Center

01

Moving Column

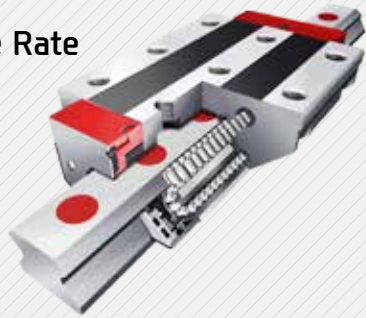
The F600D is designed with a moving column in order to maximize productivity of the incorporated Dual table. In addition, due to the enlargement of the column's width and symmetrical heat behavior column structure, heat displacement is minimized and machining accuracy is increased.

Roller Type LM Guide

The travel mechanism on F600D is equipped with Roller Type LM Guide for rigidity and reducing idle time.

Rapid Traverse Rate

42 m/min
(**1,653.5** ipm)



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



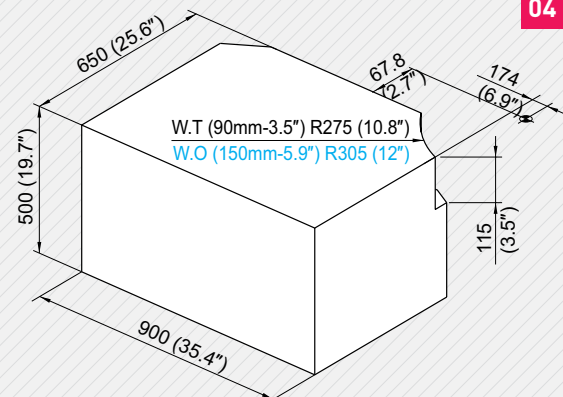
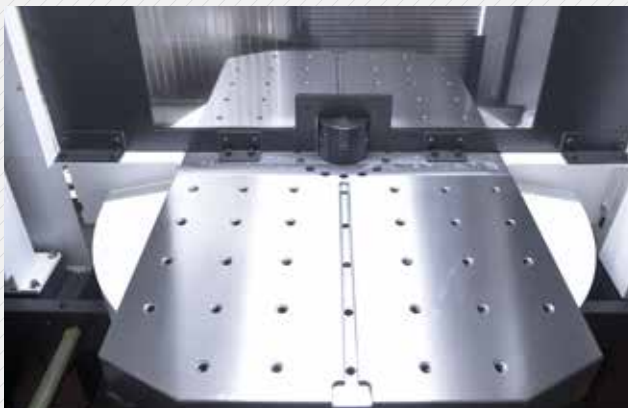
03

Directly Coupled Servo Motor

Each axis is directly connected to a highly reliable digital servo motor to provide high rigidity and minimal thermal displacement.

Dual Table

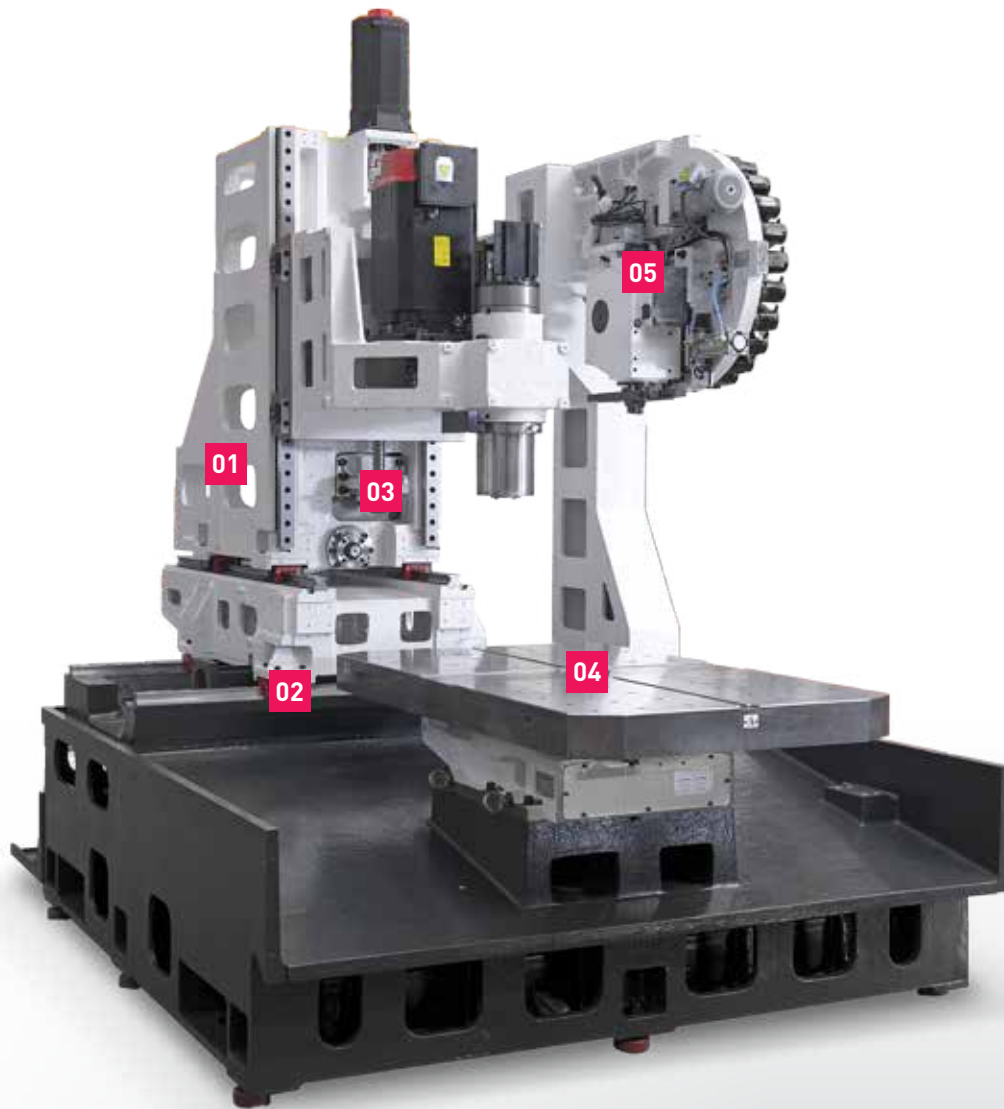
High speed 180° index rotating table increases productivity by providing the ability to load and unload on the outer table while processing on the other table.



04

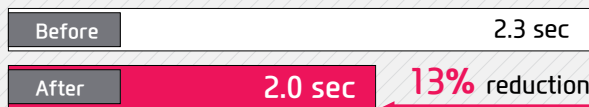
- **Table Size** (L×W) : **2-900×650** mm
(**2-35.4"×25.6"**)
- **Max. Load Capacity** : **2-400** kg (**2-882** kg)
- **Table Change Time** : **8.5** sec

Basic Features

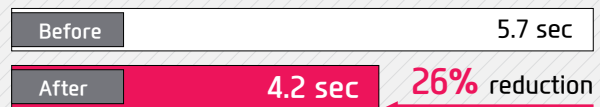


05 ATC Speed Improvement

Tool to Tool Time



Chip to Chip Time



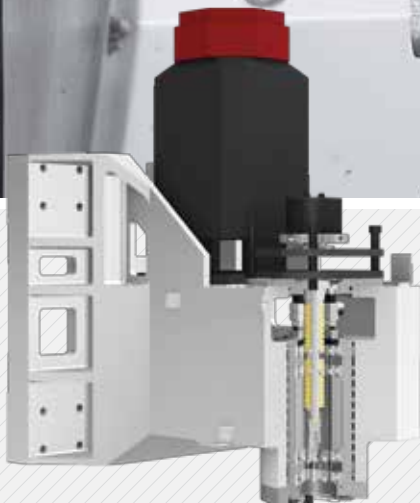
- ⊙ **Rapid Traverse Rate** (X/Y/Z axis) :
42/42/42 m/min (1,653.5/1,653.5/1,653.5 ipm)
- ⊙ **Spindle Speed** : 8,000 Belt [12,000 Direct] rpm
- ⊙ **Spindle Output**(Max./Cont.) :
15/11 [11/7.5] kW (20/15 [15/10] HP)

- ⊙ **Travel** (X/Y/Z axis) :
800/600/600 mm (31.5"/23.6"/23.6")
- ⊙ **Spindle Torque** (Max./Cont.) :
287/143 [70/47] N·m
(211.7/105.5 [51.6/34.7] lbf·ft)

04
FD Series

High Precision Spindle

Long Lasting High Accuracy & Excellent Performance
Vertical Machining Center



Belt Type Spindle

The FD Series is equipped with a Belt Type Spindle to ease maintenance and minimize machining noise.

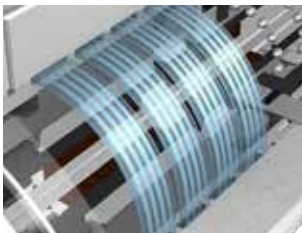
The main spindle is designed with P4 Angular Contact Ball Bearings to assure quality during high speed processing, also to stabilize high precision even over long periods of machining.

OPTION

Direct Type Spindle (F500D/600D)

The spindle motor is directly connected to the main spindle by a high speed and high precision coupling. Rapid spindle acc/deceleration is performed without backlash. The coupling also minimizes vibration and heat transfer from the motor preventing thermal displacement.

- ⦿ **Spindle Speed** : 12,000 rpm
- ⦿ **Spindle Taper** : NT #40



Spindle Cooling **OPTION**

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

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)

Tool Holders

CAT **OPTION**



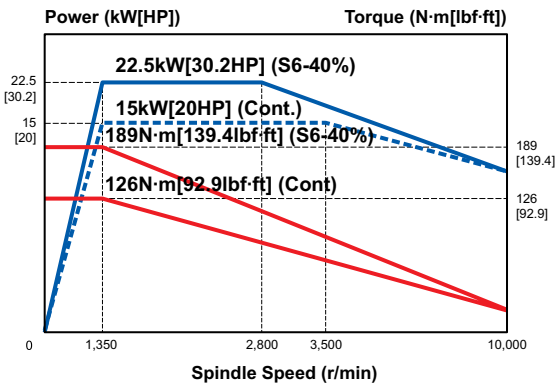
BT



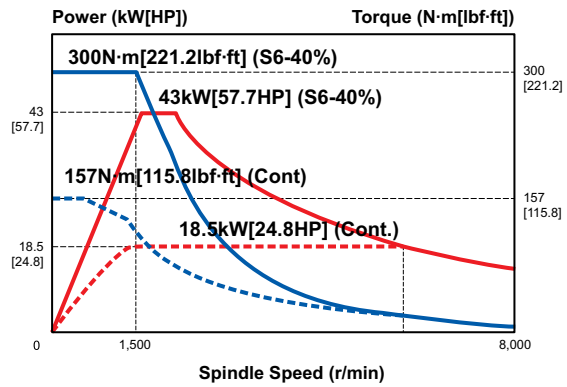
SIEMENS 1PH8 Spindle Motor

The 1PH8 Series Motor is a high quality and performance motor with the characteristics of maximum concentricity of 10 μ m and short driving time.

F410D (10,000rpm, Belt)

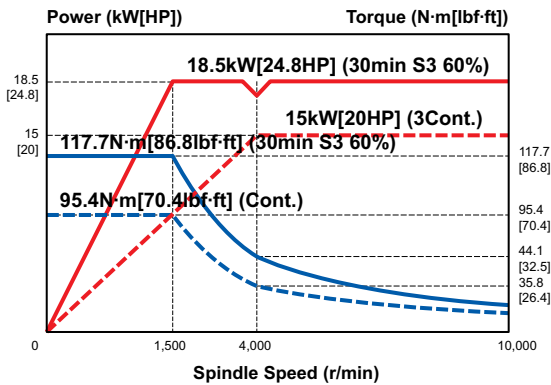


F500D (10,000rpm, Belt)

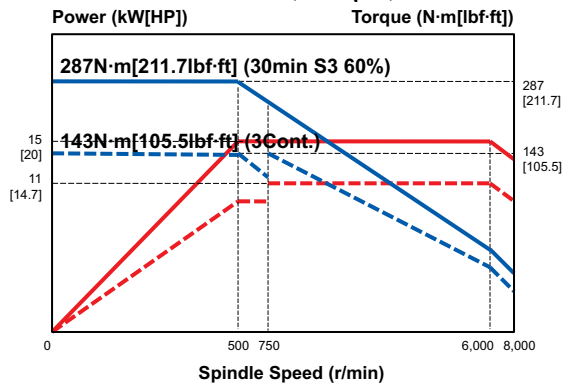


FANUC Spindle

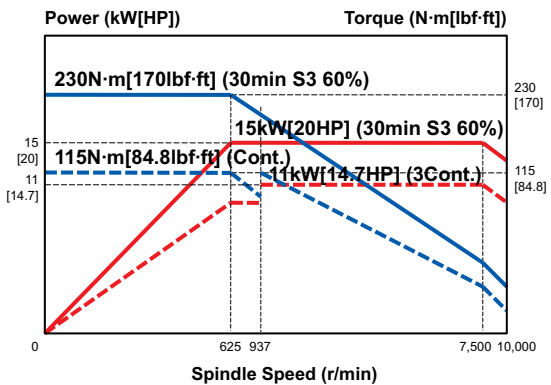
F410D (10,000rpm, Belt)



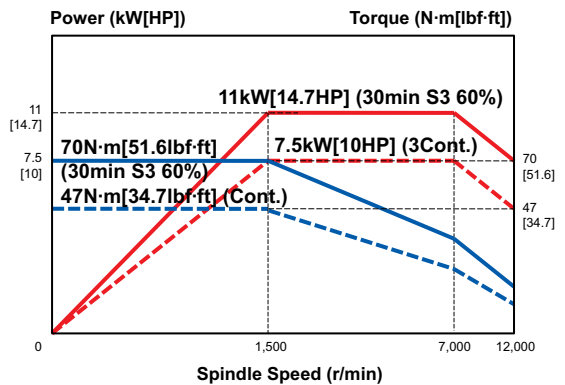
F500D/600D (8,000rpm, Belt)



F500D (10,000rpm, Belt) **OPTION**

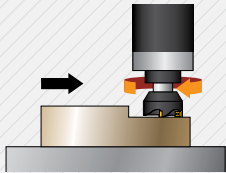


F600D (12,000rpm, Direct) **OPTION**



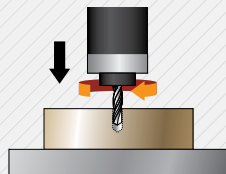
Machining Capability

F500D



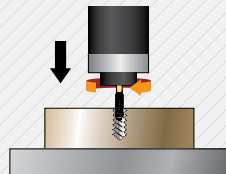
FACE MILL (Material(JIS):S45C(Carbon steel))

Tool diameter	Ø80 (Ø3.15") x 6F
Cutting depth	4.5 mm (0.177")
Cutting width	70 mm (2.755")
Cutting speed	286 m/min (11,260 ipm)
Spindle rpm	1,137 r/min
Traverse rate	0.99 mm/rev (0.038"/rev)
Chip quantity	350 cc/min



DRILL (Material(JIS):S45C(Carbon steel))

Tool diameter	Ø43 (Ø1.7") x MT4
Cutting depth	43 mm (1.7")
Cutting speed	27 m/min (1,063 ipm)
Spindle rpm	199 r/min
Traverse rate	0.38 mm/rev (0.015"/rev)
Chip quantity	109 cc/min



TAP (Material(JIS):S45C(Carbon steel))

Tap spec./Pitch	M42 x P4.5
Cutting depth	42 mm (1.65")
Cutting speed	7 m/min (0.27")
Spindle rpm	53 r/min
Traverse rate	4.5 mm/rev (0.177"/rev)

❖ The above results might be different by types of processing circumstances.



Rigid Tapping

The standard Rigid Tapping function allows fast and accurate tapping, leading to high efficiency and tool life extension.

Sample Workpieces



05

FD Series

ATC & Magazine

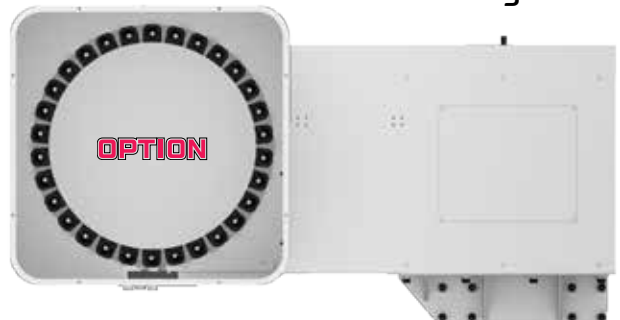
High Productivity with
High Rigidity and Accurate Machining



24 Tool Magazine



30 Tool Magazine



Servo ATC

Adopting the Twin Arm Servo ATC further enhances position control and shortens tool change time, maximizing productivity.

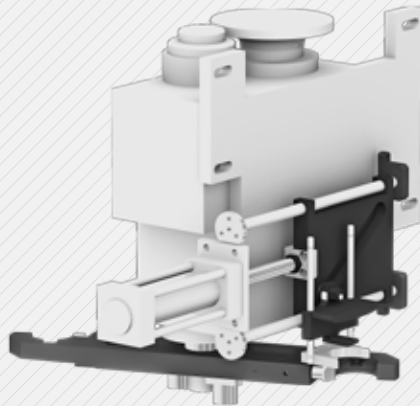
F600D standard.

Tool to Tool Time

13% Reduce

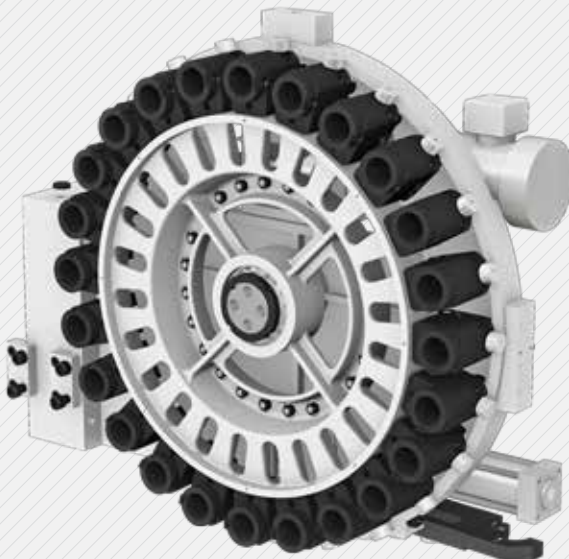
Chip to Chip Time

26% Reduce



Magazine

The tool magazine holds 24 tools as standard and 30 tools as an option. Due to the wider selection of tools and the random tool selection method, tool change time has been improved.



F410D

- ⊙ No. of Tools : **24** EA
- ⊙ Tool Shank : **BT40**
- ⊙ Max. Tool Dia. (W.T/W.O)
Ø90/Ø150(Ø3.5"/Ø5.9")
- ⊙ Max. Tool Length : **8** kg (**17.6** lb)
- ⊙ Tool Selection Method :
Random

F500D/600D

- ⊙ No. of Tools : **24** [**30**] EA
- ⊙ Tool Shank : **BT40**
- ⊙ Max. Tool Dia. (W.T/W.O)
Ø90/Ø150(Ø3.5"/Ø5.9")
- ⊙ Max. Tool Length : **8** kg (**17.6** lb)
- ⊙ Tool Selection Method :
Random

n6

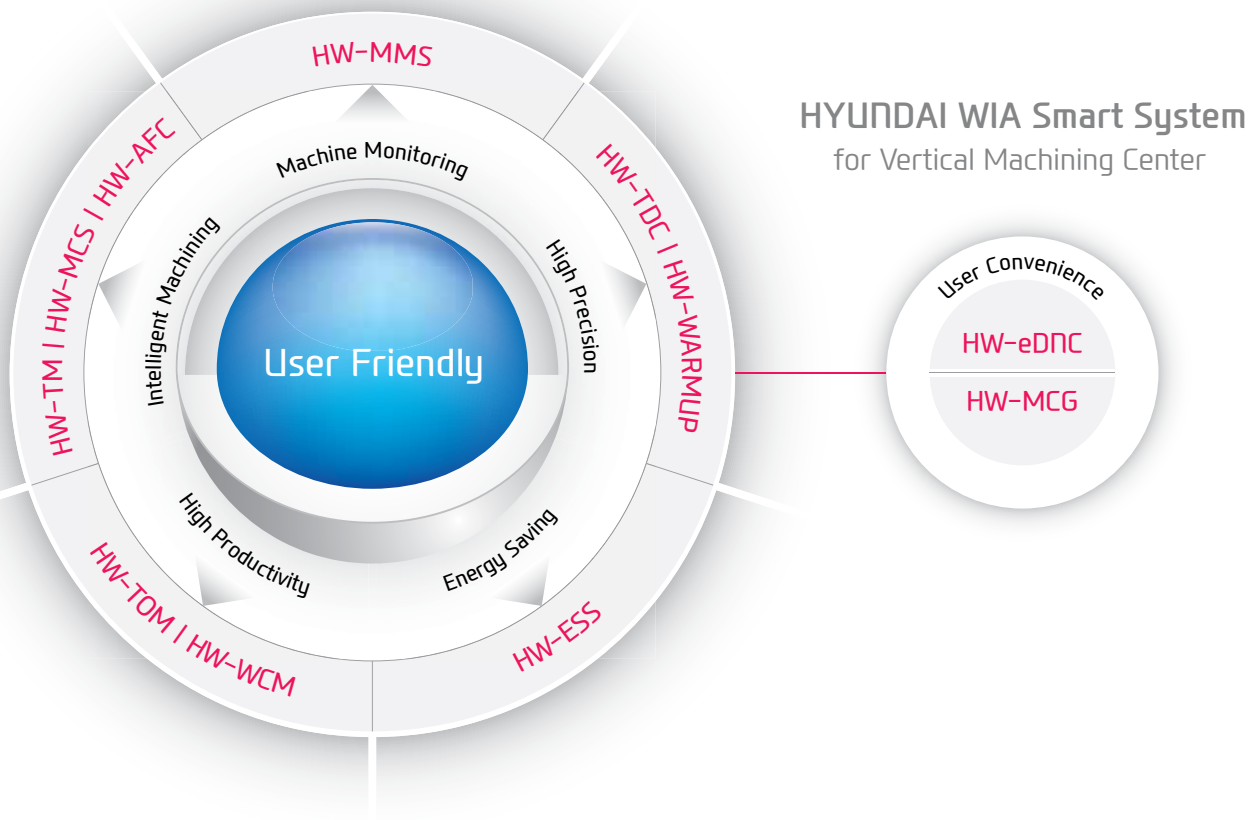
FD Series

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.



HW-MMS
HYUNDAI WIA
Machine Monitoring System

This software is for remote control monitoring of equipment status (mobile, PC.) It checks and manages the state of multiple machines and the progress of processing on a real time basis.



HW-eDNC
HYUNDAI WIA ethernet
Direct Numerical Control

This software allows transmission of NC data between PC and a machine's CNC. The processing programs can be managed on the PC through the ethernet or serial communication.

HYUNDAI WIA Smart System



HW-MCG

HYUNDAI WIA
Machine Guidance

(FANUC)

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

HYUNDAI WIA
WARMing Up

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



HW-ESS

HYUNDAI WIA
Energy Saving System

(FANUC)

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



HW-TOM

HYUNDAI WIA
Tool Offset Measurement

(FANUC)

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



HW-WCM

HYUNDAI WIA Work
Coordinate Measurement

(FANUC)

User-friendly GUI software that measures work coordinates (H/W excluded)



HW-TM

HYUNDAI WIA
Tool Monitoring

(FANUC)

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



HW-MCS

HYUNDAI WIA
Machining Condition Selection

(FANUC)

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

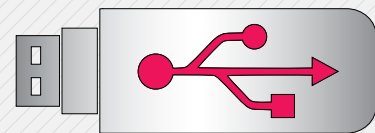


HW-AFC

HYUNDAI WIA
Adaptive Feed Control

(FANUC)

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



USB Port

Convenience is increased when inputting and outputting program. The USB port is available in addition to the former input output methods such as CF memort card and LAN.
(HW F Series, S 828D : Standard / F32i-A : Non applicable)

07

FD Series

SIEMENS Controller

Software for smart operating and machining



SIEMENS

DIFFERENTIATED CAPABILITIES, INTEGRATED ENGINEERING PERFECTLY INTERLINKED

SIEMENS 828D is a latest model CNC.

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

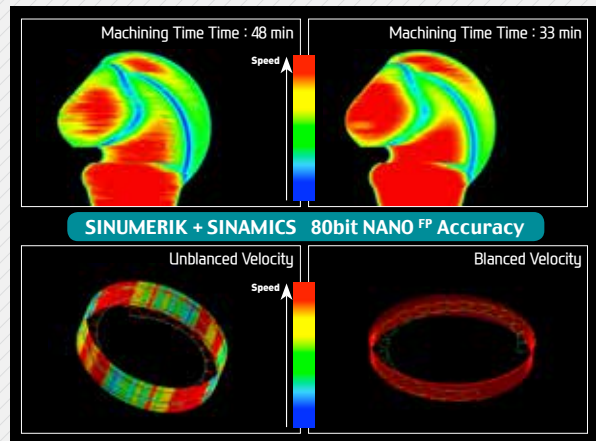
Its 80-bit control reduces processing time and increases productivity.

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



SIEMENS Advanced Surface

SIEMENS 828D comes with Advanced Surface, metal processing software that monitors speed and accuracy.



SIEMENS Technology

Shop Mill

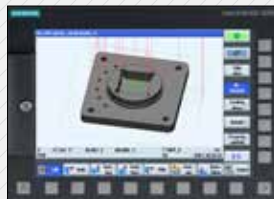
- Dialogue-type programming, simple and convenient
- Effective specifications for small quantity batch production
- Step-by-step operation possible without knowledge of the DIN/ISO code



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)

n8

FD Series

User Convenience



Various Devices for User Convenience

Measuring Device

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 tool attrition and detect broken tools.

Laser Type



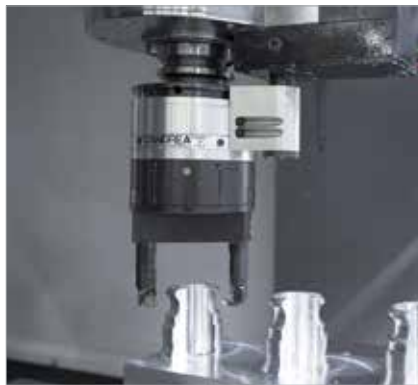
Touch Type



Precision Device

U-Center

With U-Center, both external and internal diameter turning become possible, allowing for a wide range of variety in products.



NC Rotary Table

The NCRT makes it possible to machine up to 5-axis. Various types of products can be machined.



Hydraulic Device

Hydraulic Supply Unit

Instead of the standard hydraulic supply unit, an optional fixture unit can bring the pressure up to **70 bar (1,015 psi)**, maximizing the clamping force on the fixture.



Coolant Unit

Std. Coolant (Nozzle)	Standard
Bed Flushing Coolant	Standard
Through Spindle Coolant (20/30 bar [290/435 psi])	Option
Shower Coolant	Option
Gun Coolant	Option
Side Oil Hole Coolant	Option



Chip Conveyor

Timely and effective disposal of chips will enhance productivity as well as the working environment.

- **Hinge Belt Type** : Highly efficient when disposing a lot of chips. Capable of handling stringy chips. **(Long Chip)**
- **Scraper Type** : Convenient for shortly cut chips.. **(Short Chip)**
- **Drum Filter Type** : Advantageous in precision, as the chips do not flow in to the coolant nozzle. **(AL Chip)**



Environment Device

Oil Skimmer

An oil skimmer can increase coolant and tool life by removing tramp oil contaminants.

Mist Collector

Mist Collector reduces the amount of smoke and oil mist in the air. This helps build a safe and comfortable working environment and improve durability.



SPECIFICATIONS

Standard & Optional

		F410D
Spindle		
10,000rpm (15/11kW)	(FANUC)	●
8,000rpm (17kW)	(SIEMENS)	○
Spindle Cooling System		○
ATC		
ATC Extension	24	●
	30	○
Tool Shank Type	BT40	●
	CAT40	○
U-Center	D'andrea	☆
	45°	☆
Stud Bolt Collet Change	60°	☆
	75°	●
	90°	●
		☆
Table & Column		
APC	ROTARY TURN	●
TAP TYPE Pallet		●
T-SLOT Pallet		○
NC Rotary Table		☆
High Column		-
Coolant System		
Std. Coolant (Nozzle)		●
Bed Flushing Coolant		●
Through spindle coolant*	20bar (290 psi)	○
	30bar (435 psi), 20ℓ (5.3 gal)	○
	70bar (1,015 psi), 15ℓ (4 gal)	○
		○
		○
Top Cover		○
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)		☆
Chip Disposal		
Coolant Tank	300ℓ (79.2 gal)	●
	600ℓ (158.5 gal)	-
Cabin Screw Chip Conveyor		-
Chip Conveyor (Tank Position/Chip Disposal)	Hinge Scraper	
	Rear (Left)	○
Special Chip Conveyor (Drum Filter)		☆
Chip Wagon	Standard (180ℓ [47.5 gal])	○
	Swing (200ℓ [52.8 gal])	○
	Large Swing (290ℓ [76.6 gal])	○
	Large Size (330ℓ [87.2 gal])	○
	Customized	☆
Safety Device		
Total Splash Guard		●
S/W		
Machine guidance (HW-MCG) : FANUC		☆
Tool Monitoring (HW-TM) : FANUC		○
DNC Software (HW-eDNC)		○
Spindle Heat Distortion Compensation (HW-TDC)		○
Spindle Warm up Function (HW-WARMUP)		○
Energy Saving System (HW-ESS) : FANUC		☆
Machine Monitoring System (HW-MMS)		☆
Tool Offset Measurement (HW-TOM) : FANUC		○
Work Coordinate Measurement (HW-WCM) : FANUC		○
Machining Condition Selection (HW-MCS) : FANUC		○
Adaptive Feed Control (HW-AFC) : FANUC		○

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

		F410D
ETC		
Tool Box		●
Customized Color	Need Munsel No.	☆
CAD&CAM Software		☆
Electric Device		
Call Light	1 Color : ●	●
Call Light	3 Color : ● ● ●	○
Call Light & Buzzer	3 Color : ● ● ● B	○
Work Light		●
Electric Cabinet Light		○
Door Inter-Lock		●
Remote MPG		●
3 Axis MPG	FANUC	○
	SIEMENS	-
Spindle Load Meter	FANUC	○
	SIEMENS	●
Spindle Speed Meter	FANUC	○
	SIEMENS	●
Work Counter	Digital	○
Total Counter	Digital	○
Tool Counter	Digital	○
Multi Tool Counter	6EA	○
	9EA	○
Electric Circuit Breaker		○
AVR (Auto Voltage Regulator)		☆
Transformer	25kVA	○
Flash Memory Card		○
Auto Power Off		○
Back up Module for Black out		○
Measuring Device		
Air Zero	TACO	○
	SMC	○
Work Measuring Device		○
TLM	Touch	○
(Marposs/Renishaw/Bloom)	Laser	☆
Tool Broken Detecting Device		☆
Linear Scale	X/Y/Z Axis	-
Coolant Level Sensor (Only for Chip Conveyor)		☆
Environment		
Air Conditioner		○
Dehumidifier		○
Oil Mist Collector		○
Oil Skimmer (Only for Chip Conveyor)		○
MQL (Minimal Quantity Lubrication)		☆
Fixture & Automation		
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/Pallet	☆
	2Axis/Pallet	-
External M Code 4ea		○
Automation Interface		☆
I/O Extension (In & Out)	16Contact	○
	32Contact	○
Hyd. Device		
Std. Hyd. Unit	65bar (942.7 psi) / 35ℓ (9.2 gal)	●
	45bar (652.7 psi) / 60ℓ (15.8 gal)	-
	45bar (652.7 psi) / 13ℓ (3.4 gal)	-
Center Hyd. Supply Device	2x3 (6 Port)	○
	2x5 (10 Port)	○
Compact Center		-
Hyd. Supply Device	2x3 (6 Port)	-
Fixture Hyd. Unit	70bar (1,015 psi)	○
	100bar (1,450 psi)	○
	Customized	☆

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

SPECIFICATIONS

Standard & Optional

Spindle		F500D	F600D
8,000rpm (15/11kW)	BELT	●	●
8,000rpm (17kW)	BELT (SIEMENS)	○	-
10,000rpm (15/11kW)	BELT	○	-
12,000rpm (11/7.5kW)	DIRECT	○	○
Spindle Cooling System	8,000rpm	○	○
	10,000rpm	●	-
	12,000rpm	●	●
ATC			
ATC Extension	24	●	●
	30	○	○
Tool Shank Type	BT40	●	●
	CAT40	○	○
U-Center	D'andrea	☆	☆
	45°	●	●
	60°	☆	☆
	75°	☆	☆
Stud Bolt Collet Change	90°	☆	☆
Table & Column			
APC	ROTARY TURN	●	●
TAP TYPE Pallet		●	●
T-SLOT Pallet		○	-
NC Rotary Table		☆	☆
High Column		-	-
Coolant System			
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)	○	○
Top Cover		○	○
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)		☆	☆
Chip Disposal			
Coolant Tank	460 ℓ (121.5 gal)	●	-
	600 ℓ (158.5 gal)	○	○
Cabin Screw Chip Conveyor		-	-
Chip Conveyor (Tank Position/Chip Disposal)	Hinge		
	Right (Rear)	○	○
Special Chip Conveyor (Drum Filter)		☆	☆
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	☆	☆
Safety Device			
Total Splash Guard		●	●
S/W			
Machine guidance (HW-MCG) : FANUC		☆	☆
Tool Monitoring (HW-TM) : FANUC		○	○
DNC Software (HW-eDNC)		○	○
Spindle Heat Distortion Compensation (HW-TDC)		○	○
Spindle Warm up Function (HW-WARMUP)		○	○
Energy Saving System (HW-ESS) : FANUC		☆	☆
Machine Monitoring System (HW-MMS)		☆	☆
Tool Offset Measurement (HW-TOM) : FANUC		○	○
Work Coordinate Measurement (HW-WCM) : FANUC		○	○
Machining Condition Selection (HW-MCS) : FANUC		○	○
Adaptive Feed Control (HW-AFC) : FANUC		○	○

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

ETC		F500D	F600D
Tool Box		●	●
Customized Color	Need Munsell No.	☆	☆
CAD&CAM Software		☆	☆
Electric Device			
Call Light	1 Color : ●	●	●
Call Light	3 Color : ● ● ●	○	○
Call Light & Buzzer	3 Color : ● ● ● B	○	○
Work Light		●	●
Electric Cabinet Light		○	○
Door Inter-Lock		●	●
Remote MPG		●	●
3 Axis MPG	FANUC	○	○
	SIEMENS	-	-
Spindle Load Meter	FANUC	○	○
	SIEMENS	●	-
Spindle Speed Meter	FANUC	○	○
	SIEMENS	●	-
Work Counter	Digital	○	○
Total Counter	Digital	○	○
Tool Counter	Digital	○	○
Multi Tool Counter	6EA	○	○
	9EA	○	○
Electric Circuit Breaker		○	○
AVR (Auto Voltage Regulator)		☆	☆
Transformer	25kVA	-	-
	35kVA	○	○
Flash Memory Card		○	○
Auto Power Off		○	○
Back up Module for Black out		○	○
Measuring Device			
Air Zero	TACO	○	○
	SMC	○	○
Work Measuring Device		○	○
TLM	Touch	○	○
(Marposs/Renishaw/Bloom)	Laser	☆	☆
Tool Broken Detective Device		☆	☆
Linear Scale	X/Y/Z Axis	○	○
Coolant Level Sensor (Only for Chip Conveyor)		☆	☆
Environment			
Air Conditioner		○	○
Dehumidifier		○	○
Oil Mist Collector		○	○
Oil Skimmer (Only for Chip Conveyor)		○	○
MQL (Minimal Quantity Lubrication)		☆	☆
Fixture & Automation			
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/Pallet	☆	☆
	2Axis/Pallet	-	-
External M Code 4ea		○	○
Automation Interface		☆	☆
I/O Extension (In & Out)	16Contact	○	○
	32Contact	○	○
Hyd. Device			
Std. Hyd. Unit	65bar (942.7 psi) / 35 ℓ (9.2 gal)	-	-
	45bar (652.7 psi) / 60 ℓ (15.8 gal)	●	-
	45bar (652.7 psi) / 13 ℓ (3.4 gal)	-	●
Center Hyd. Supply Device	2x3 (6 Port)	○	○
	2x5 (10 Port)	○	○
Compact Center Hyd. Supply Device	2x3 (6 Port)	○	-
Fixture Hyd. Unit	70bar (1,015 psi)	○	○
	100bar (1,450 psi)	-	-
	Customized	☆	☆

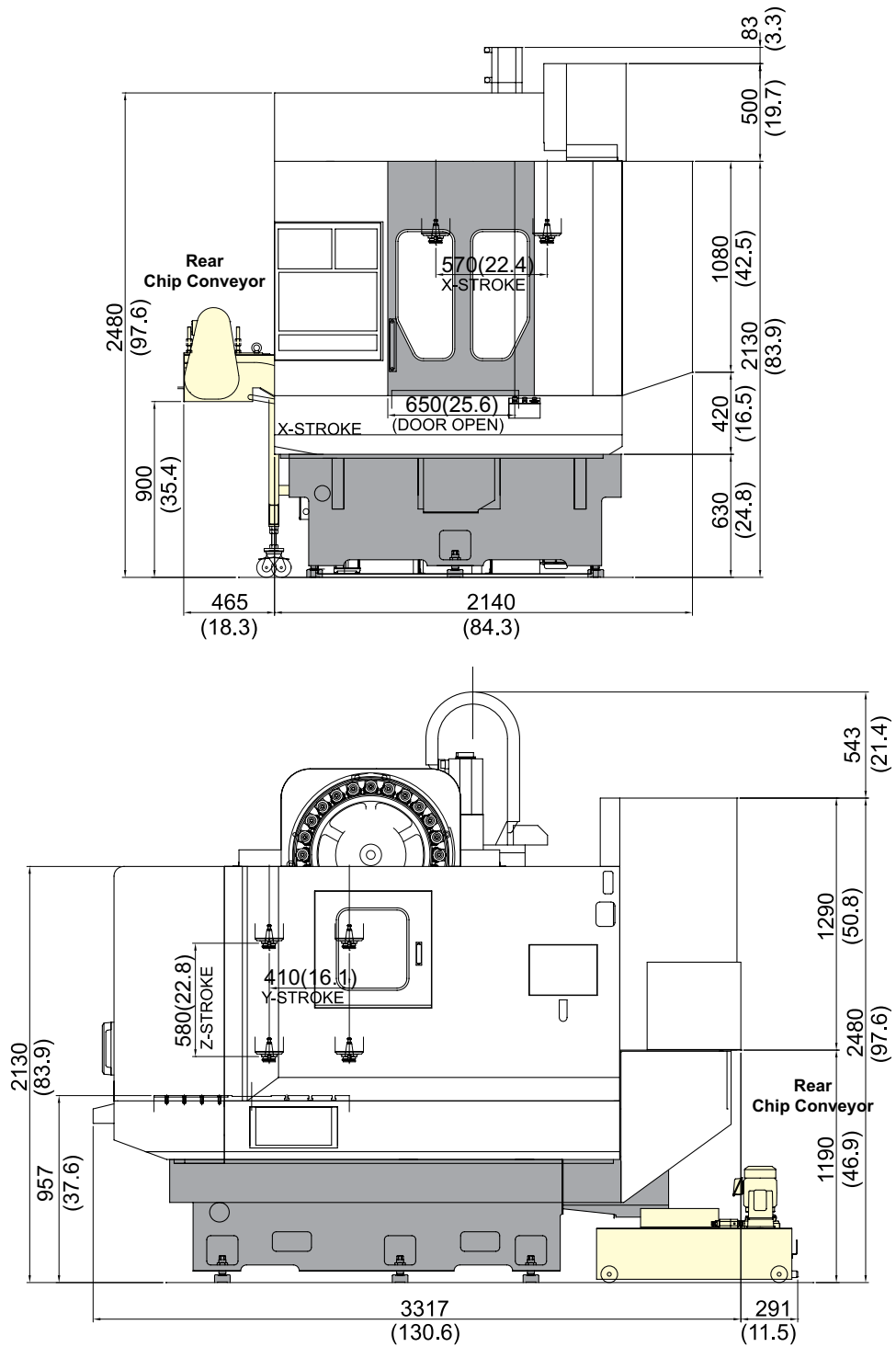
Through Spindle Coolant* : Please check the filter types with sales representative.
Specifications are subject to change without notice for improvement.

SPECIFICATIONS

External Dimensions

unit : mm(in)

F410D

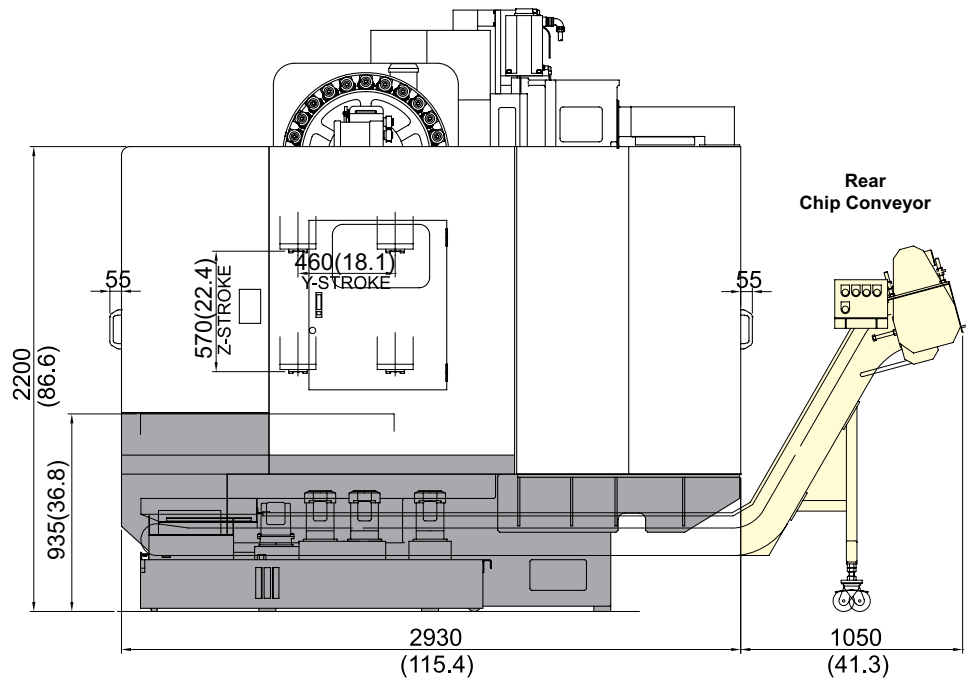
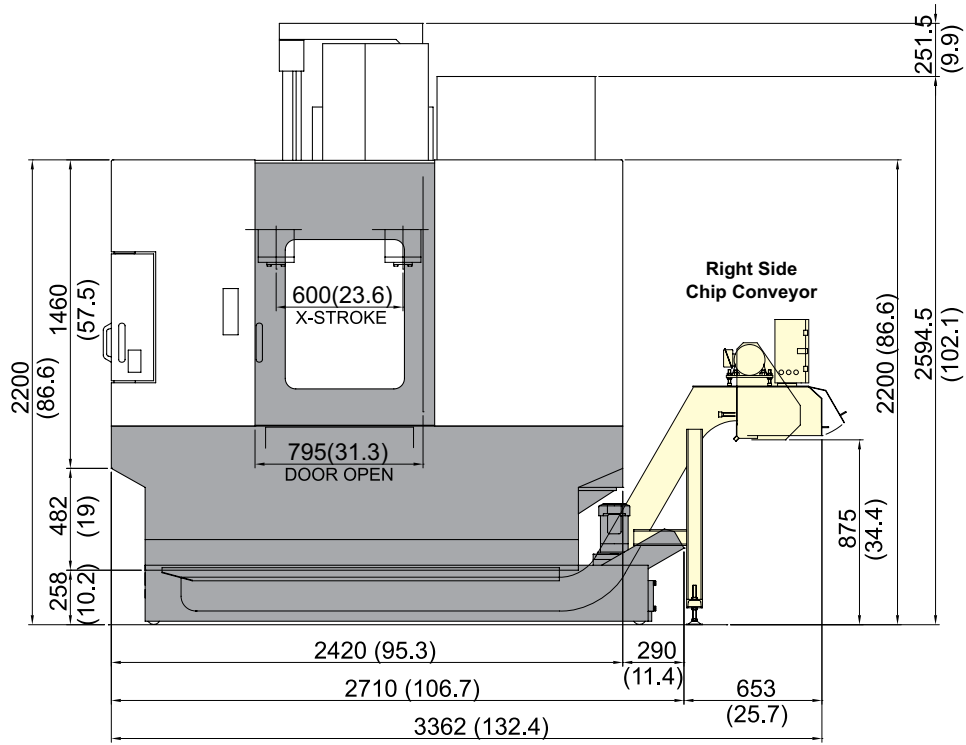


SPECIFICATIONS

External Dimensions

unit : mm(in)

F500D

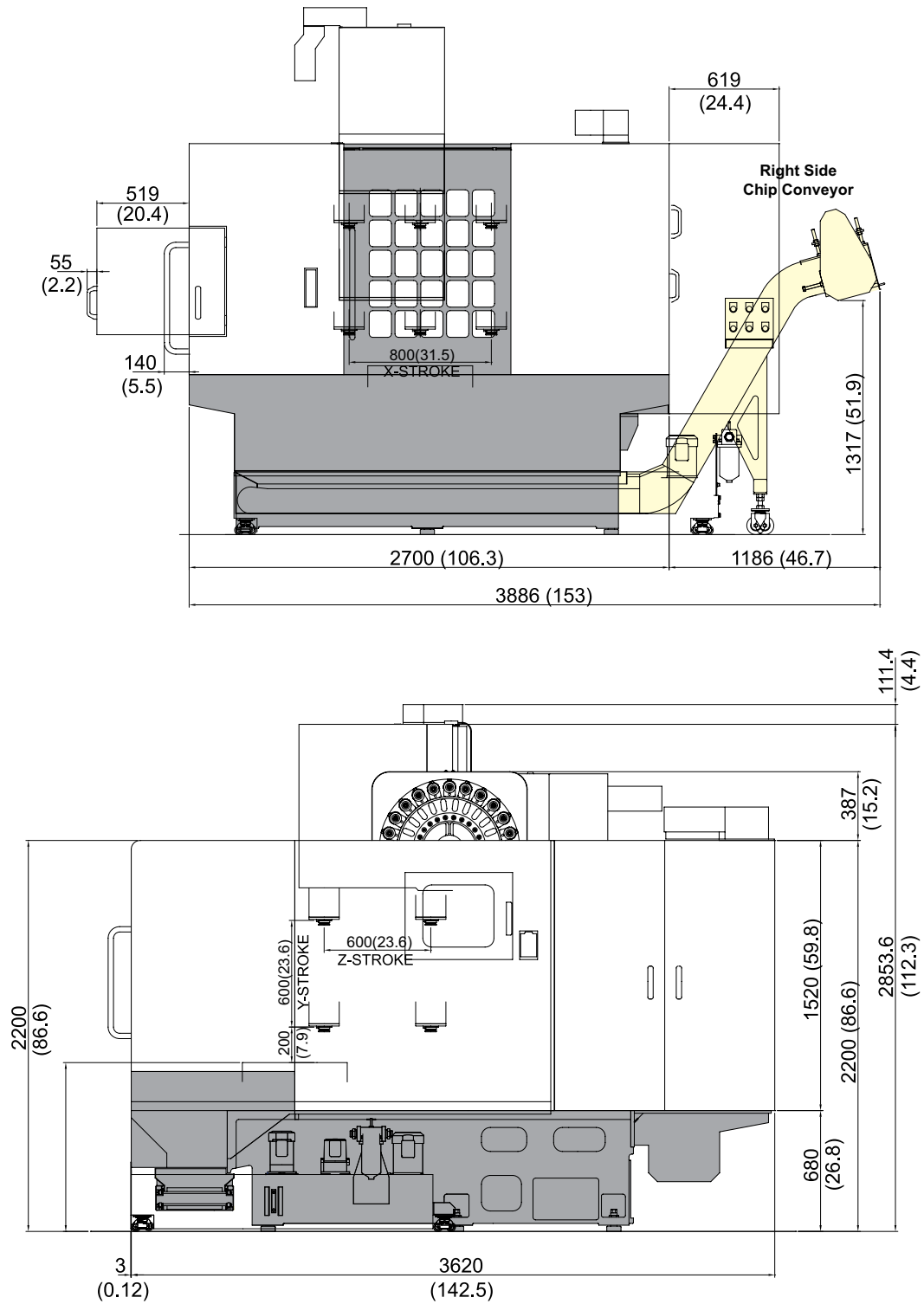


SPECIFICATIONS

External Dimensions

unit : mm(in)

F600D

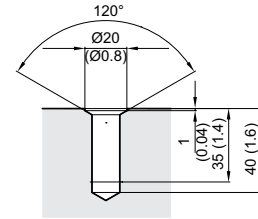
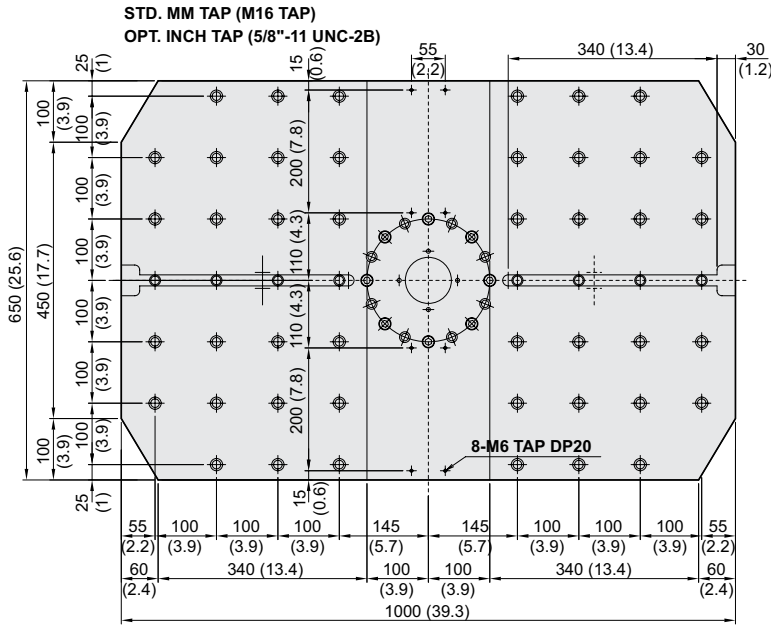


SPECIFICATIONS

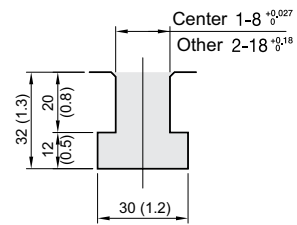
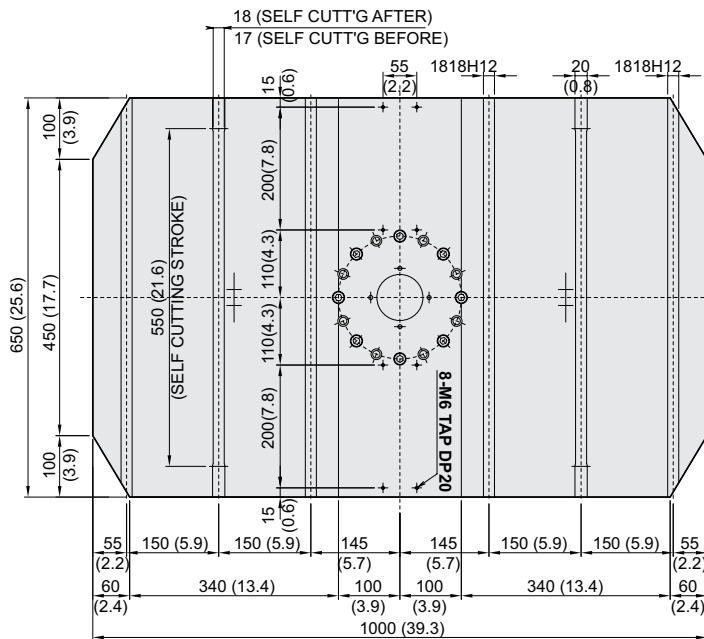
Table Dimensions

unit : mm(in)

F410D



Tap Detail
(M16 Tap)



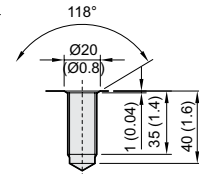
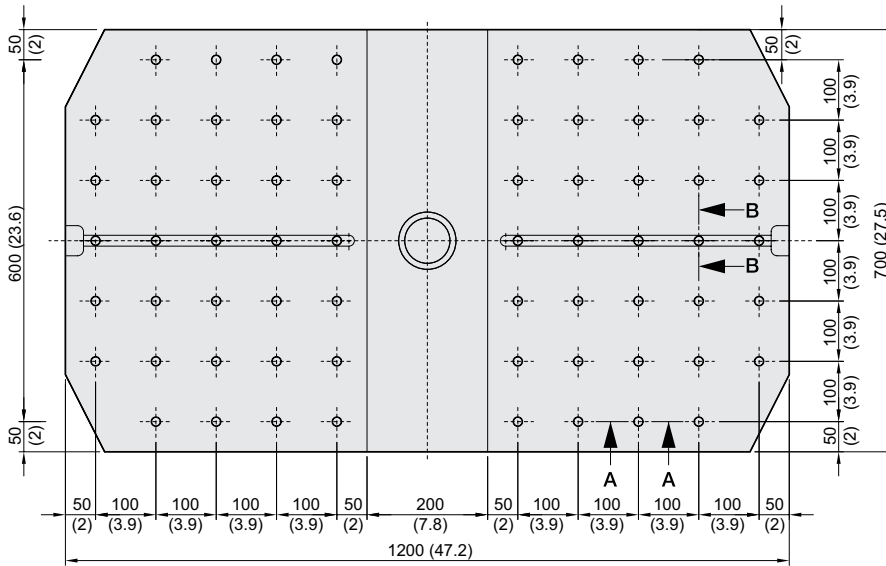
T-Slot Detail

SPECIFICATIONS

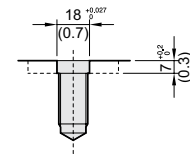
Table Dimensions

unit : mm(in)

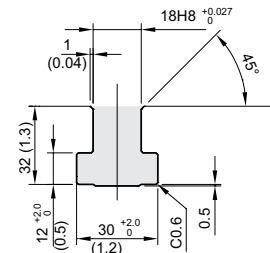
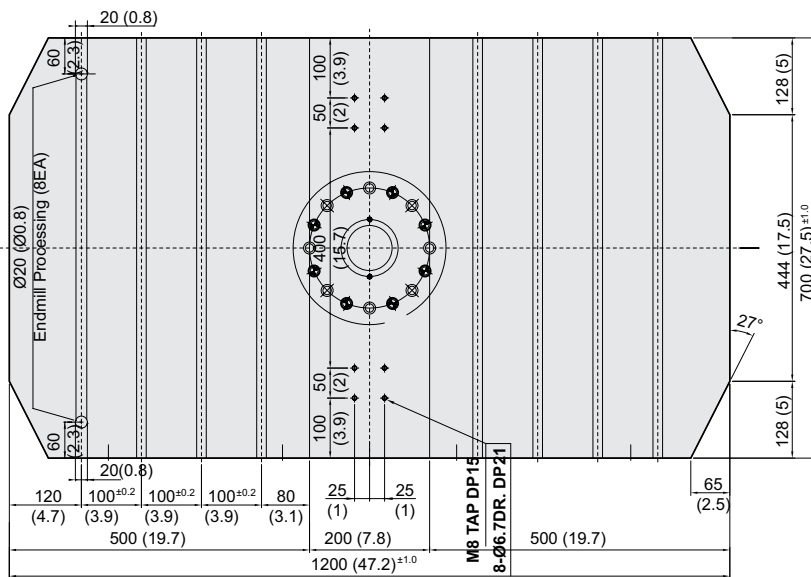
F500D



SECTION A-A
Tap Detail
(M16 Tap)



SECTION B-B
Tap Detail
(M16 Tap)



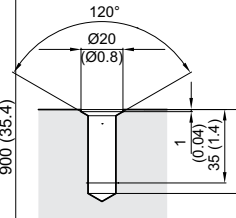
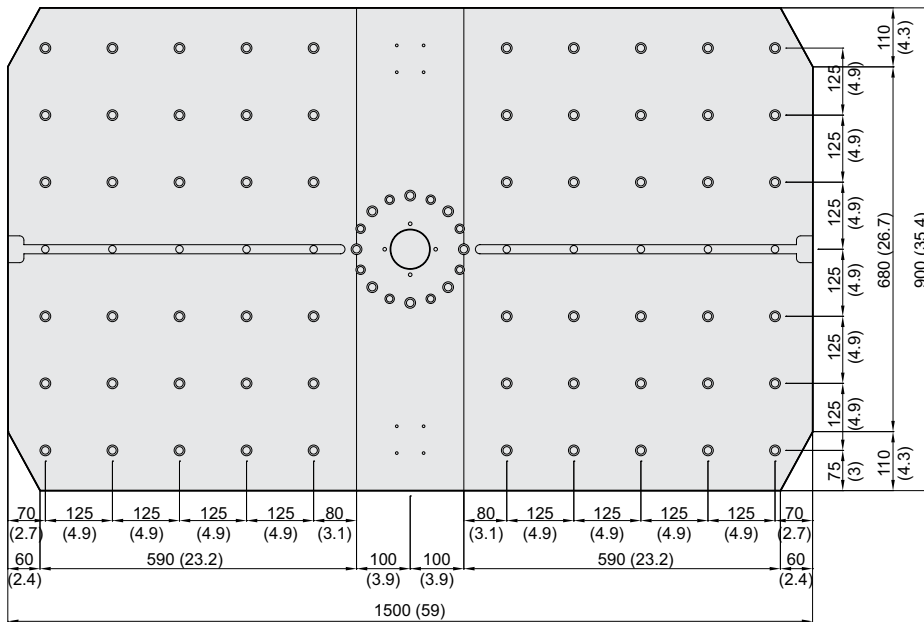
T-Slot Detail

SPECIFICATIONS

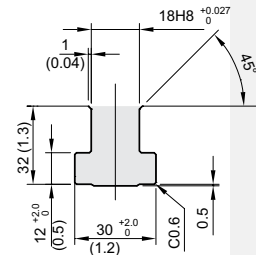
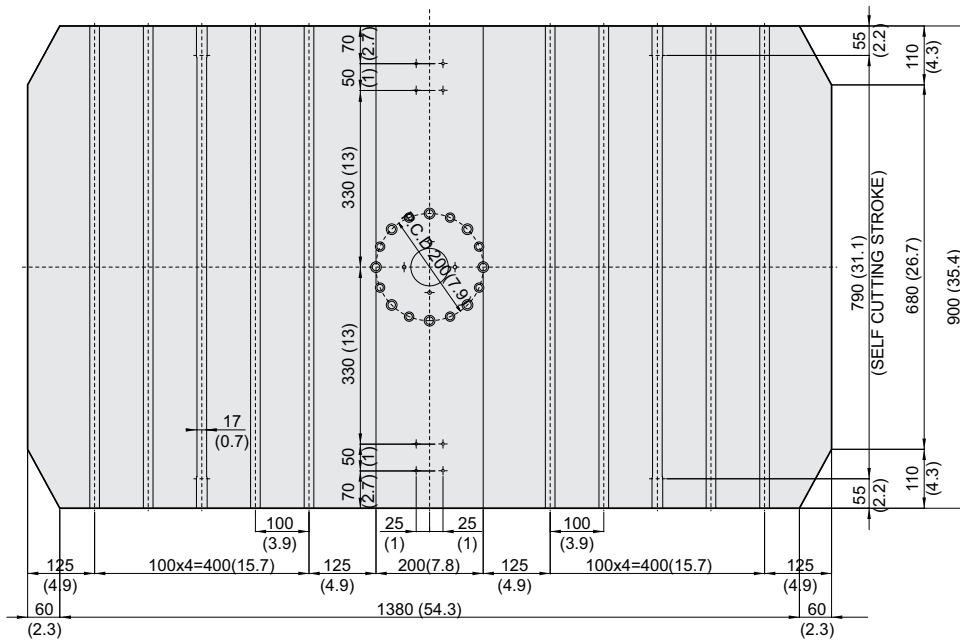
Table Dimensions

unit : mm(in)

F600D



Tap Detail
(M16 Tap)



T-Slot Detail

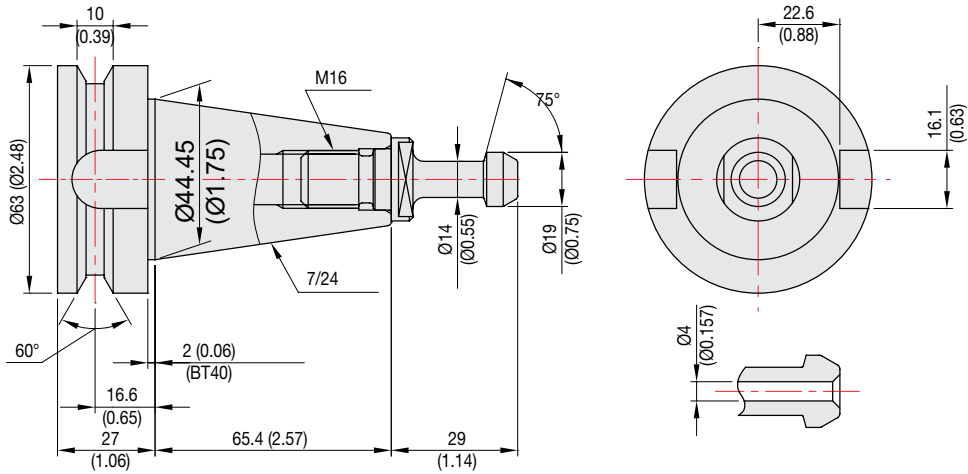
SPECIFICATIONS

Tool Shank

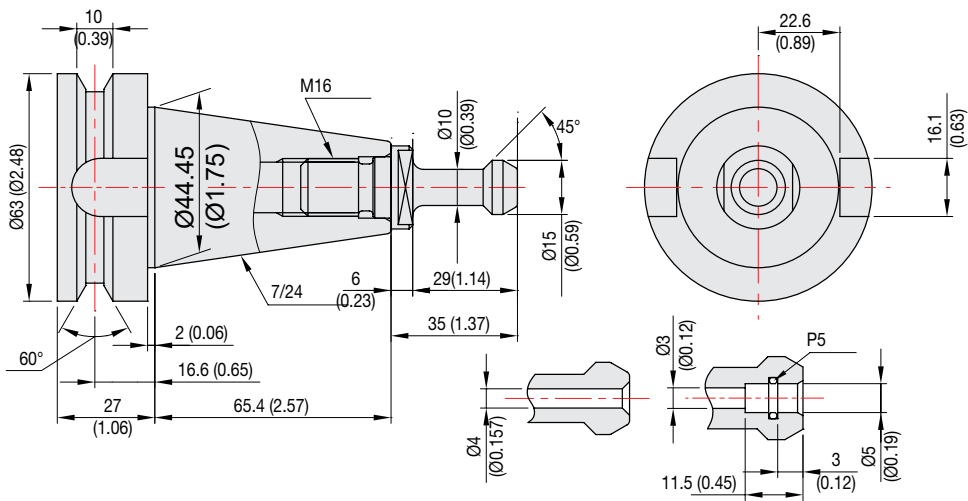
unit : mm(in)

BT40

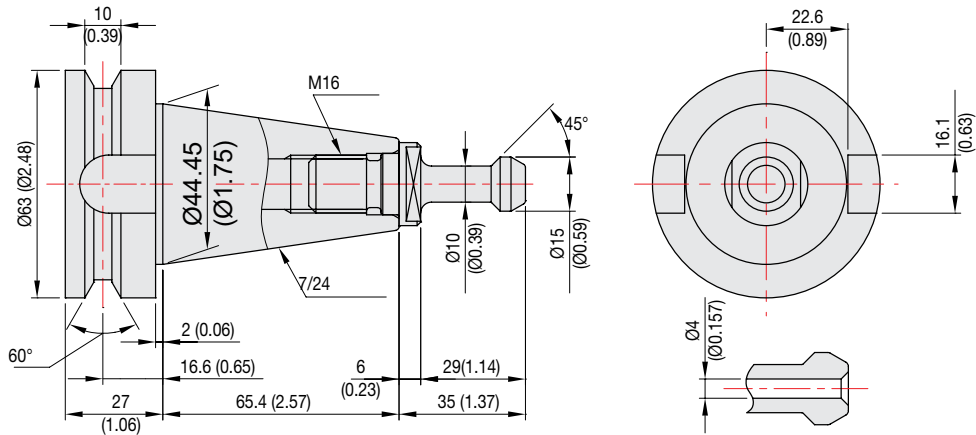
F410D



F500D



F600D



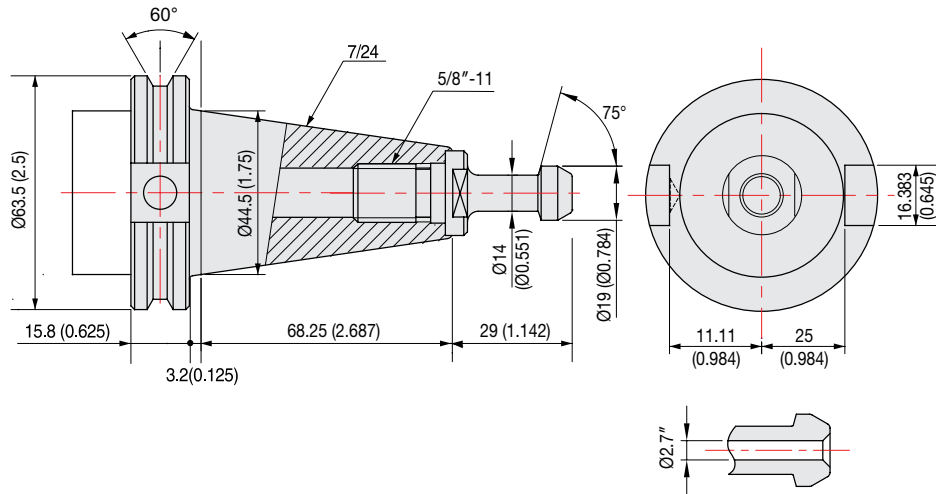
SPECIFICATIONS

Tool Shank

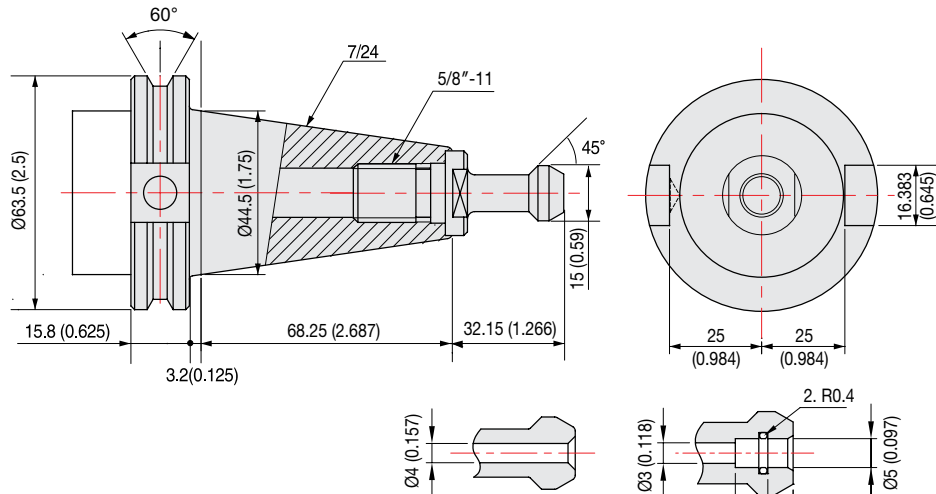
unit : mm(in)

CAT40

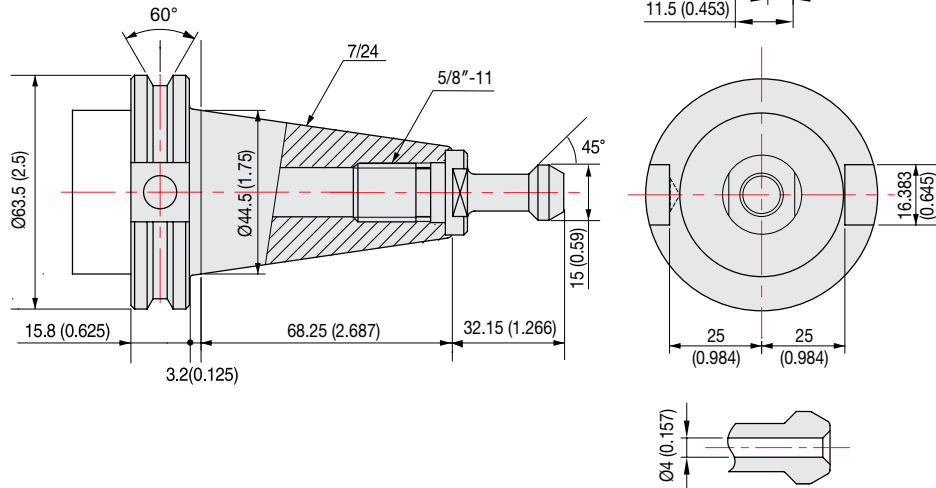
F410D



F500D



F600D



SPECIFICATIONS

Specifications

[] : Option

ITEM		F410D	F500D	
TABLE	Table Size	mm(in)	2-650×410 (2-25.6"×16.1")	2-700×500 (2-27.6"×19.7")
	Maximum Load Capacity	kg(lb)	2-250 (2-551.2)	2-350 (2-771.6)
	Table Change Time	sec	5.2	6
	Change Method	-	Rotary Turn	
	Table Driving Method	-	Rack & Pinion	
SPINDLE	Spindle Taper	-	NT #40	
	Spindle RPM	r/min	10,000 [10,000]	8,000 [8,000] [10,000] [12,000]
	Spindle Power Output (Max./Cont.)	kw(HP)	18.5/15(25/20) [22.5/15(30.2/20)]	15/11(20/15) [43/18.5(57.6/24.8) [15/11(20/15)] [11/7.5(15/10)]
	Spindle Torque (Max./Cont.)	N·m(lbf·ft)	117.7/95.4(86.8/70.3) [189/126(139.4/93)]	287/143(211.6/105.4) [300/157(221.2/115.8)] [230/115(169.6/84.8)] [70/47(51.6/34.6)]
	Spindle Driving Method	-	BELT [BELT]	BELT [BELT] [BELT] [DIRECT]
FEED	Travel (X/Y/Z)	mm(in)	570/410/580 (22.4"/16.1"/22.8")	600/460/570 (23.6"/18.1"/22.4")
	Distance from Table Surface to SP	mm(in)	197~777 (7.8"~30.6")	200~770 (7.9"~30.3")
	Distance from Column to SP. center	mm(in)	495 (19.5")	500 (19.7")
	Rapid Traverse Rate (X/Y/Z)	m/min(ipm)	36/36/30 (1,417/1,417/1,181)	40/40/30 (1,575/1,575/1,181)
	Slide Type	-	LM GUIDE	X/Y : ROLLER GUIDE, Z : BOX GUIDE
ATC	Number of Tools	ea	24	24 [30]
	Tool Shank	-	BT40	
	Max. Tool Dia. (W.T / W.O)	mm(in)	Ø90 / Ø150 (3.5"/5.9")	
	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	1.3
C-C		sec	3.5	4.3
TANK CAPACITY	Coolant Tank	ℓ (gal)	300 (79.3)	
	Lubricating Tank	ℓ (gal)	1.32 (0.3)	3.1 (0.8)
	Hydraulic Tank	ℓ (gal)	35 (9.2)	60 (15.9)
POWER SUPPLY	Air Consumption (0.5MPa)	ℓ /min	400	
	Electric Power Supply	kVA	30	28
	Thickness of Power Cable	Sq	Over 22	Over 25
	Voltage	V/Hz	220/60 (200/50)	
MACHINE	Floor Space (L×W)	mm(in)	2,200×3,160 (86.6"×124.4")	2,710×2,930 (106.7"×115.4")
	Height	mm(in)	3,015 (118.7")	2,852 (112.3")
	Weight	kg(lb)	6,400 (14,109.6)	9,500 (20,943.9)
PC	Controller	-	HW F i Series [F 32i-B] [SIEMENS 828D]	HW F i Series [F 32i-A] [SIEMENS 828D]

SPECIFICATIONS

Specifications

[] : Option

ITEM		F600D	
TABLE	Table Size	mm(in)	2-900×650 (2-35.4"×25.6")
	Maximum Load Capacity	kg(lb)	2-400 (2-881.8)
	Table Change Time	sec	8.5
	Change Method	-	ROTARY TURN
	Table Driving Method	-	RACK & PINION
SPINDLE	Spindle Taper	-	NT #40
	Spindle RPM	r/min	8,000 [12,000]
	Spindle Power Output (Max./Cont.)	kW(HP)	15/11(20/15 [11/7.5(15/10)])
	Spindle Torque (Max./Cont.)	N·m(lb·ft)	287/143(211.6/105.4) [70/47(51.6/34.7)]
	Spindle Driving Method	-	BELT [DIRECT]
FEED	Travel (X/Y/Z)	mm(in)	800/600/600 (31.5"/23.6"/23.6")
	Distance from Table Surface to SP	mm(in)	200~800 (7.9"~31.5")
	Distance from Column to SP. center	mm(in)	690 (27.2")
	Rapid Traverse Rate (X/Y/Z)	m/min(ipm)	42/42/42 (1,653.5/1,653.5/1,653.5)
	Slide Type	-	ROLLER GUIDE
ATC	Number of Tools	ea	24 [30]
	Tool Shank	-	BT40
	Max. Tool Dia. (W.T / W.O)	mm(in)	Ø90 / Ø150 (3.5"/5.9")
	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 C-C	sec sec
TANK CAPACITY	Coolant Tank	ℓ (gal)	600 (158.5)
	Lubricating Tank	ℓ (gal)	3.1 (0.8)
	Hydraulic Tank	ℓ (gal)	23 (6.1)
POWER SUPPLY	Air Consumption (0.5MPa)	ℓ /min	400
	Electric Power Supply	kVA	30
	Thickness of Power Cable	Sq	Over 25
	Voltage	V/Hz	220 / 60 (200 / 50)
MACHINE	Floor Space (L×W)	mm(in)	2,720×3,620 (107.1"×142.5")
	Height	mm(in)	2,965 (116.7")
	Weight	kg(lb)	8,500 (18,739.3)
PC	Controller	-	HYUNDAI WIA FANUC i Series [FANUC 32i-A]

CONTROLLER

SIEMENS 828D (F410D/500D)

Control Function

Max. configuration of axis	5 axis
Max. configuration of axis and sp.	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	
Spindle Orientation	
Spindle Speed Limitation	50% - 120%
Rigid Tapping	

Interpolations

Linear interpolation axis	Max 4 axis
Circle via center point and end point	
Circle via interpolation point	
Helical interpolation	
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)	Standard 100 EA
Programmable Zero Offset	
3D Tool Radius Compensation	
Tool management	

Display

CRT / MDI	TFT 10.4" Color
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	
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	
Interactive CYCLE program	
Block Search	
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

Two Language switchable	Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Russian, Swedish, Portuguese, Turkish
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Data Transfer

RS 232C I/F	
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 Mill	Interactive program
TRACYL	
TRANSMIT	

CONTROLLER

HYUNDAI WIA FANUC i Series

Axis control / Display unit

Controlled axis	3-axes (X, Y, Z)
Simultaneous controllable axis	3-axes (G00 & G01 : 3-axes, G02 & G03 : 2-axes)
Least input increment	X, Y, Z axis : 0.001 mm (0.0001")
Least command increment	X, Y, Z axis : 0.001 mm (0.0001")
Inch/Metric conversion	G20 / G21
Interlock	Each axis / All axes
Machine lock	All axes
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)
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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	F0, 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	O4 / P8
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, P1 ~P48 (48 pairs)
Manual absolute	"On" fixed
Programmable data input	G10
Sub program call	10 Step
Custom macro	
Addition to custom macro common variables	#100 ~ #199, #500 ~ #999
Circular interpolation	G02, G03
Canned cycle	G73, G74, G76, G80 ~ G89

Program input & Interpolation functions

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)
Polar coordinate command	G15, G16

Sub / Spindle functions

Miscellaneous function	M3 digits
Miscellaneous function lock	
Spindle speed command	S5 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 P/C 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
Two way pitch error compensation	
Manual Guide OI	8.4" color LCD
Manual Guide I	10.4" color LCD (Interactive Program)
Dynamic graphic display	
Optional block skip add	9 ea (Application can be limited)
AI contour control(AICC)	40 Block
AI contour control(AICC) II	200 Block
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)

CONTROLLER

FANUC 32i-B (F410D)

[] : Option, ☆ : Technical consultation needed

Controlled axis / Display / Accuracy compensation		Auxiliary function / Spindle speed function	
Control axes	3 axes (X, Y, Z)	Auxiliary function	M & 4 digit
Simultaneously controlled axes	3 axes [Max. 4 axes]	Level-up M code	Multi / Bypass M code
Least setting Unit	X, Y, Z, axes : 0.001 mm (0.0001") B axes : 1 deg [0.001] deg	Spindle speed function	S & 5 digit , Binary output
Least input increment	X, Y, Z, axes : 0.001 mm (0.0001") B axes : 1 deg [0.001] deg	Spindle override	50% ~ 150% (10% Unit)
Inch / Metric conversion	G20/G21	Multi position spindle orientation	M19
High response vector control		FSSB high speed rigid tapping	
Interlock	All axes / Each axis	Tool function / Tool compensation	
Machine lock	All axes	Tool function	Max. T 8 digit
Backlash compensation	± 0 ~ 9999 pulses (Rapid traverse / Cutting feed)	Tool life management	☆ 256 pairs
Position switch		Tool offset pairs	64 pairs
LCD / MDI	10.4" color LCD	Tool nose radius compensation	G40, G41, G42
Feedback	Absolute motor feedback	Tool nose length compensation	
Stored stroke check 1	Over travel	Tool offset memory C	Tool length, diameter, abrasion (length, diameter)
Stored pitch error compensation		Tool length measurement	Z axes Input C
Operation		Editing function	
Automatic operation (Memory)		Part program storage size	640m (256KB)
MDI operation		No. of registerable programs	500 EA
DNC operation	Needed DNC software / CF card	Program protect	
Program restart		Background editing	
Wrong operation prevention		Extended part program editing	Copy, move and change of NC program
Program check function	Dry run, Program check Z axes Machine lock, Stroke check before move	Memory card program edit	
Single block		Data input / output & Interface	
Search function		I/O interface	RS 232C, CF card, USB memory
Interpolation functions		Screen hard copy	
Pano interpolation		External message	
Positioning	G00	External key input	
Linear interpolation	G01	External workpiece number search	
Circular interpolation	G02, G03	Automatic data backup	
Exact stop mode	Single : G09, Continuous : G61	Setting, display and diagnosis	
Dwell	G04 0~9999.9999 sec	Self-diagnosis function	
Skip	G31	History display	Alarm & Operator message & Operation
Reference position return	1st reference : G28 Ref. position check : G27 2nd reference : G30	Run hour / Parts count display	
Thread synchronous cutting	G33	Maintenance information	
Helical interpolation	Circular + Linear interpolation 2 axes(max.)	Actual cutting feedrate display	
Feed function / Acc. & Dec. control		Display of spindle speed / T code	
Manual feed	Rapid traverse Jog : 0~2,000 mm/min (79 ipm) Manual handle : x1, x10, x100 pulses Reference position return	Graphic display	
Cutting Feed command	Direct input F code	Operating monitor screen	Spindle / Servo load etc...
Feedrate override	0 ~ 200% (10% Unit)	Power consumption monitoring	Spindle & Servo
Rapid traverse override	F1%, F5%, F25% / 50%, F100%	Spindle / Servo setting screen	
Override cancel		Multi language display	Support 20 languages
Feed per minute	G98	Display language switching	Selection of 5 optional Languages
Feed per revolution	G99	LCD Screen Saver	Screen saver
Look-ahead block	40 Block, 200 Block (Mold)	Processing select	Speed/rigidity setting
Program input		Option	
Tape Code	EIA/ISO	Additional optional block skip	☆ 9 EA
Optional block skip	1EA	Fast ethernet	Needed option board
Absolute / Incremental program	G90/G91	Data server	Needed option board
Program stop / end	M00, M01/M02, M30	Protection of data at 8 levels	
Maximum command unit	±999,999.999 mm (±99,999.9999 inch)	Sub Spindle control	
Plane selection	X-Y : G17, X-Z : G18, Y-Z : G19	Polar coordinate command	G15, G16
Workpiece coordinate system	G52, G53, 6 pairs (G54 ~ G59)	Polar coordinate interpolation	G12.1, G13.1
Manual absolute	Fixed ON	Cylindrical interpolation	G07.1
Programmable data input	G10	One-way positioning	G60
Sub program call	10 folds nested	Stored stroke check 2, 3	
Custom macro	#100~#199, #500~#999	Inverse-time feed	G93
G code system	A	Scaling	G50, G51
Programmable mirror image	G51.1, G50.1	Manual guide i	Interactive auto program
G code preventing buffering	G4.1	Handle interrupt	
Including Chamfering / Corner R		Manual handle feed	2/3 units
Canned cycle	G73, G74, G76, G80 ~ G89	Additional custom macro variables	#100~#199, #500~#999 #100~#199, #500~#999, #98000~#98499
Coordinate rotation	G68, G69	Rigid tap Return	
		Tool management function	
		Tool offset number	☆ Max. 400 pair
		Program storage capacity	☆ 512KB~2MB
		Program registration number	☆ Max. 1000 ea
		Additional work coordinate	48 pair (G54.1 P1 ~ P48)
		AICC II	200 block, ☆ 400 block

CONTROLLER

FANUC 32i-A

Axis control / Display unit

Controlled axis	3-axes (X, Y, Z)
Simultaneous controllable axis	3-axes (G00 & G01 : 3 axes, G02 & G03 : 2-axes)
Least input increment	X, Y, Z axis : 0.001mm (0.0001")
Least command increment	X, Y, Z axis : 0.001mm (0.0001")
Inch / Metric conversion	G20 / G21
Interlock	Each axis / All axes
Machine lock	All axes
Emergency stop	
Stored stroke check 1	
Mirror Image	
Follow-up	
Servo off	
Backlash compensation	+/- 0~9999 pulse (rapid traverse & cutting feed)
Position switch	
Pitch error compensation	
LCD/MDI	10.4" color LCD

Operation

Automatic operation (memory)	
MDI operation	
Research Function	Sequence, Program
Program restart	
Dry run	
Single Block	
Buffer register	
Memory Card DNC operation	

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	0~5,000mm/min (197ipm)
Rapid traverse override	F0, F25%, F50%, F100%
Override cancel	
Rapid traverse bell-shaped acce/deceleration	

Program input & Interpolation functions

Label Skip	
Interpolation function	Positioning/Linear/Circular (G00/G01/G02/G03)
Exact stop mode/Exact stop	G61 / G09
Control in/out	
Dwell	
Helical interpolation	G04, 0~9999.9999sec
Threading/synchronous feed	
Manual reference point return	
Reference point return	
Reference point return check	G28
2nd. Reference point return	G27
Program stop/end	G30
Tape code	M00, M01 / M02, M30
Optional block skip	EIA / ISO (Automatic recognition)
Max. programmable dimensions	1 ea
Program number	+/- 9999.9999" (+/- 8digit)
/Sequence number	04 / 18 digit
Absolute/incremental command	
Decimal point input	G90 / G91
Plane selection	
Work coordinate preset	G17, G18, G19
Manual absolute	G52~G59
Programmable data input	"On" fixed
Sub program call	G10
Custom macro	10 Step
AI Contour Control(AICC) I	
Circular interpolation	
Canned cycle	
Optional chamfering/corner R	G73, G74, G76, G80 ~ G89
Skip function	
Automatic coordinate system setting	G31
Coordinate system rotation	
Programmable mirror image	

Sub / Spindle functions

Miscellaneous function	M3 digit
Miscellaneous function lock	
Spindle speed command	S5 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 compensation	G43, G44, G49
Tool offset pairs	64 Pair
Tool life management	

Data input / Output & Editing functions

Reader/Puncher interface	RS232C
Memory card input/output	
Embedded Ethernet	100 Mbps
Part program storage length	320 m (128 Kbyte)
Registered programs	125 ea
Memory lock	
Back ground editing	
Extended part program editing	Copy, move, change of NC program
External message	

Setting, Display, Diagnosis

Self-diagnosis function	
Alarm history display	Alarm & Message
Help function	
Run hour/Parts count display	
Actual cutting feedrate display	
Graphic display	
Spindle/Servo setting screen	
Operation monitor screen	Loadmeter Light
Selection of 5 optional language	
LCD Screen Save	Screen saver
Auto Data Backup	
Manual Guide i	Interactive Programming

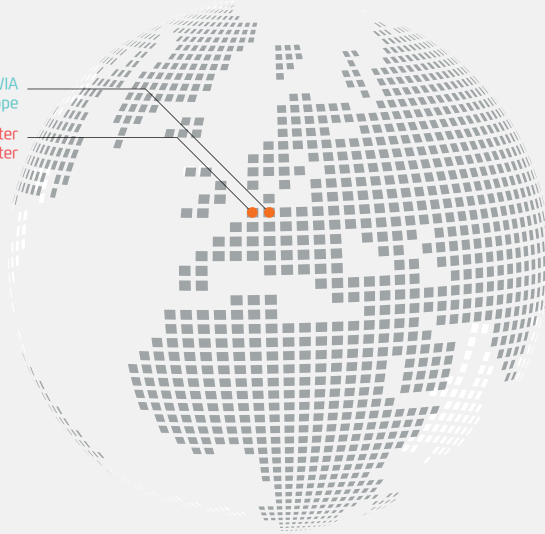
Option

Sub Axis Control	
Additional work coordinate system	48 Pair / 300 Pair
Additional custom micro change	#100~#199, #500~#999
Work coordinate Command	
Work coordinate Interpolation	
Circular Interpolation	
Single direction positioning	G60
FAST ethernet	100 Mbps
Data server	1GB
AI Contour Control II(AICC II)	
Additional optional blockskip	9 ea (Application can be limited)
Handle interupt	
Manual Handle Feed	3 unit
program storage length	640m (256Kbyte) ~ 5120m (2Mbyte)
Dynamic graphic display	
Protection of data at 8 levels	
Tool monitoring function	HWTM (Embedded FANUC Type)

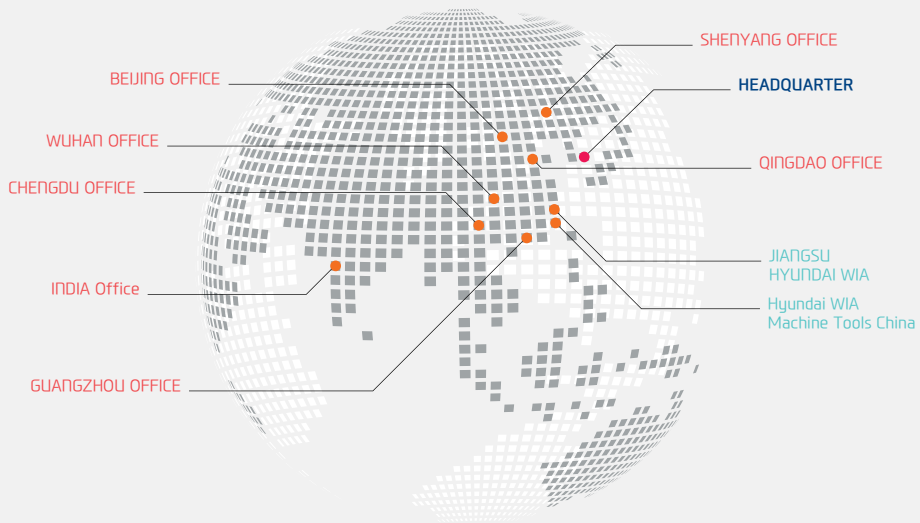
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F410D Movie



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