# F750B/960B

HYUNDAI WIA Heavy Duty Cutting Vertical Machining Center

HYUNDAI WIA

# **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
- HYUNDAI-iTROL 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

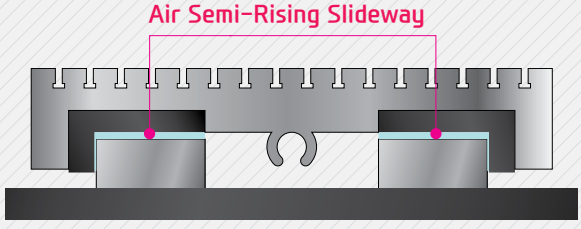
Box guideways effectively offset vibration enabling the machining of high precision products.

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

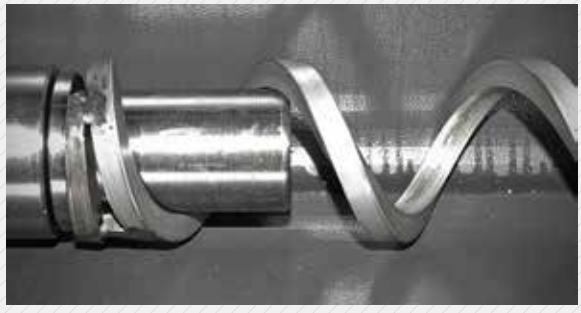
By applying the air semi-rising slideways, the load on the X/Z-axis slideway is decreased. Therefore, positioning and repeatability accuracy can be maintained for a long time.




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

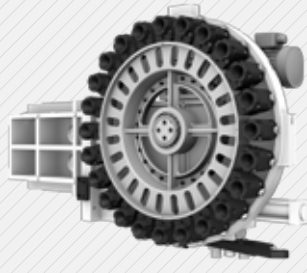
## Gear Type Spindle

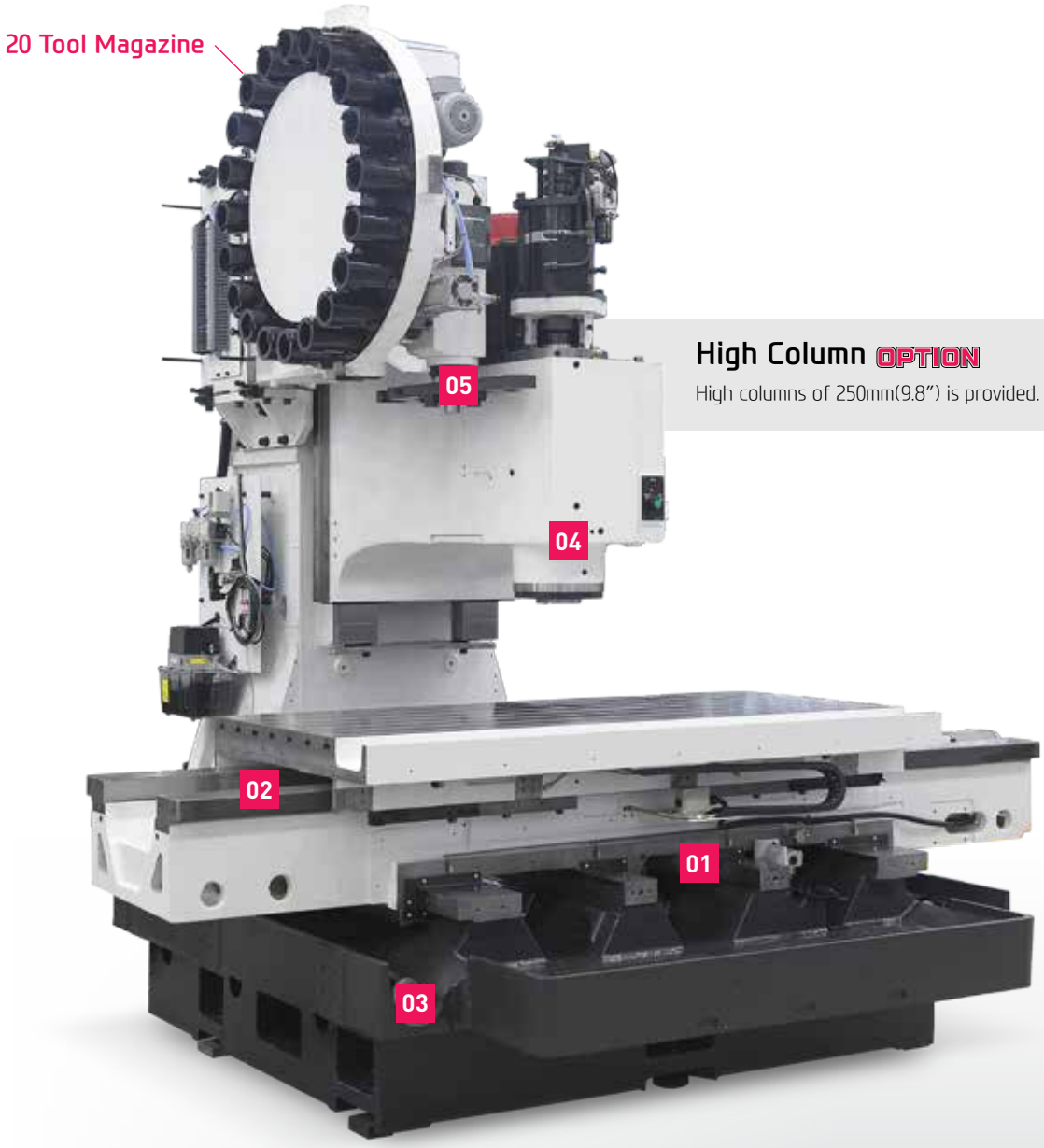
F750B is designed with a 2 step gear drive, providing both high spindle speed and powerful torque.

05

## High Speed ATC

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






**High Column** OPTION

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

## 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)

[HYUNDAI-ITROL]

02

F750B/960B

# F960B Basic Structure

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

## 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.

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.

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.

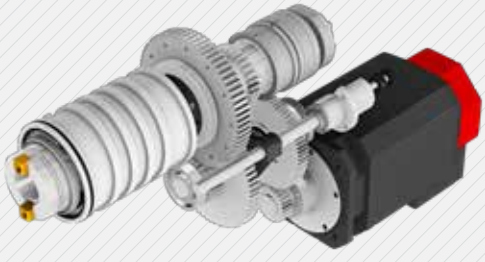
## Directly Coupled Servo Motor

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.

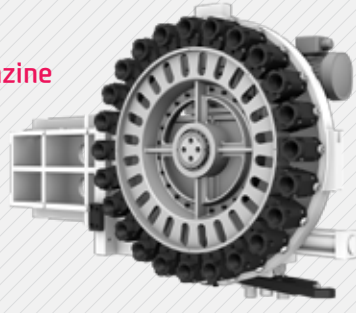


04

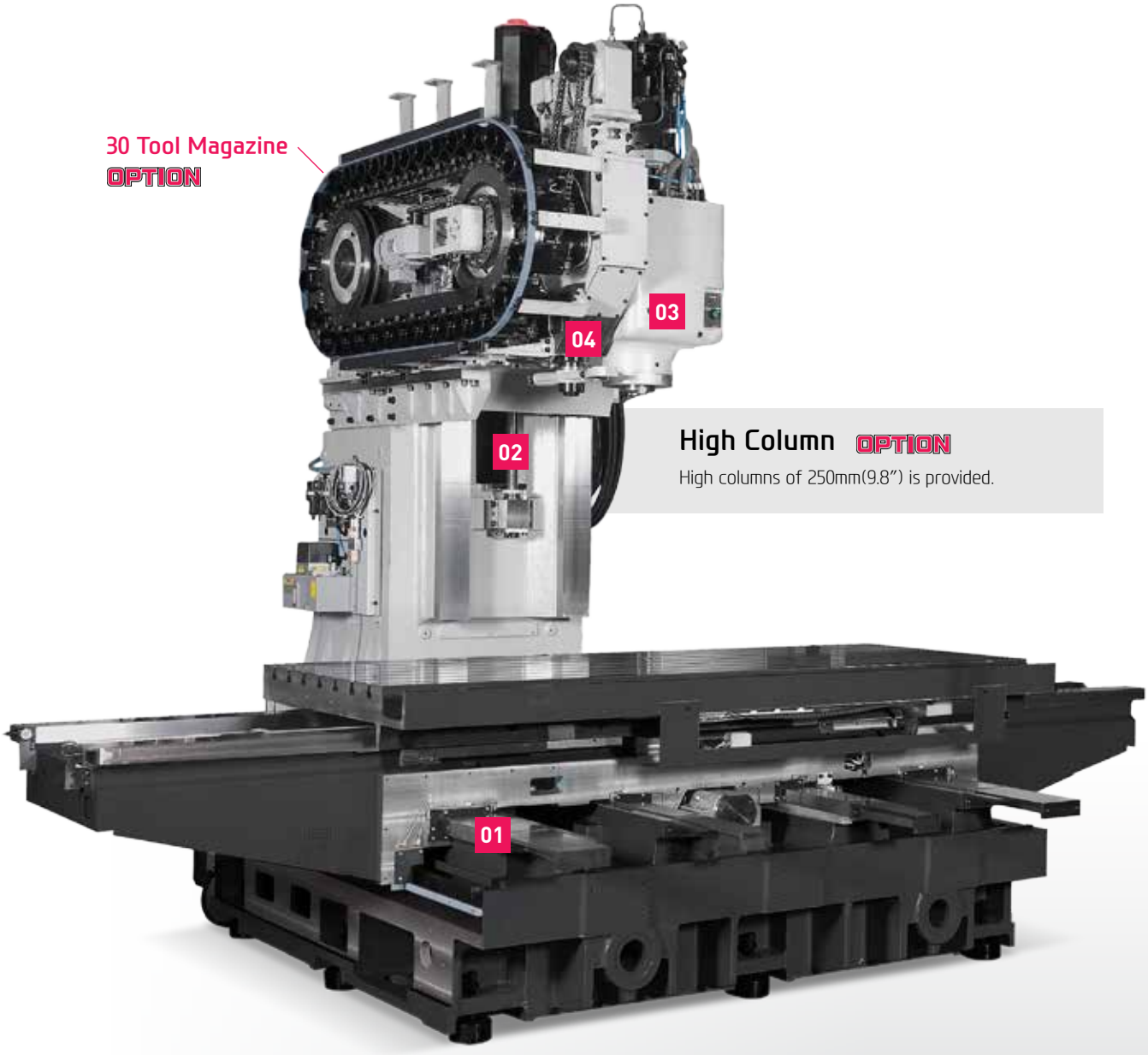
## Magazine

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

20 Tool Magazine



# Basic Structure




**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)

[HYUNDAI-ITROL]

n3

F750B/960B

# High Precision Spindle

High Accuracy & Excellent Performance
Vertical Machining Center

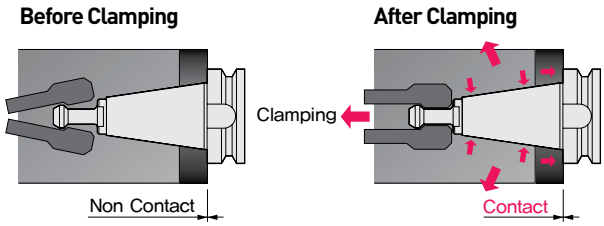
## Spindle

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.




## 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.

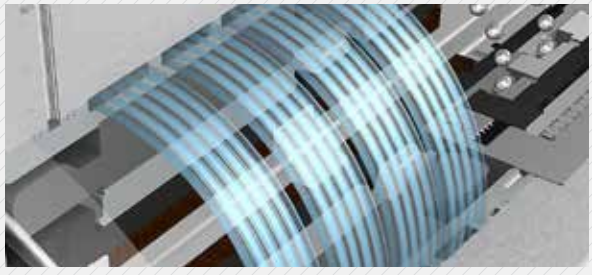
### Through Spindle Coolant

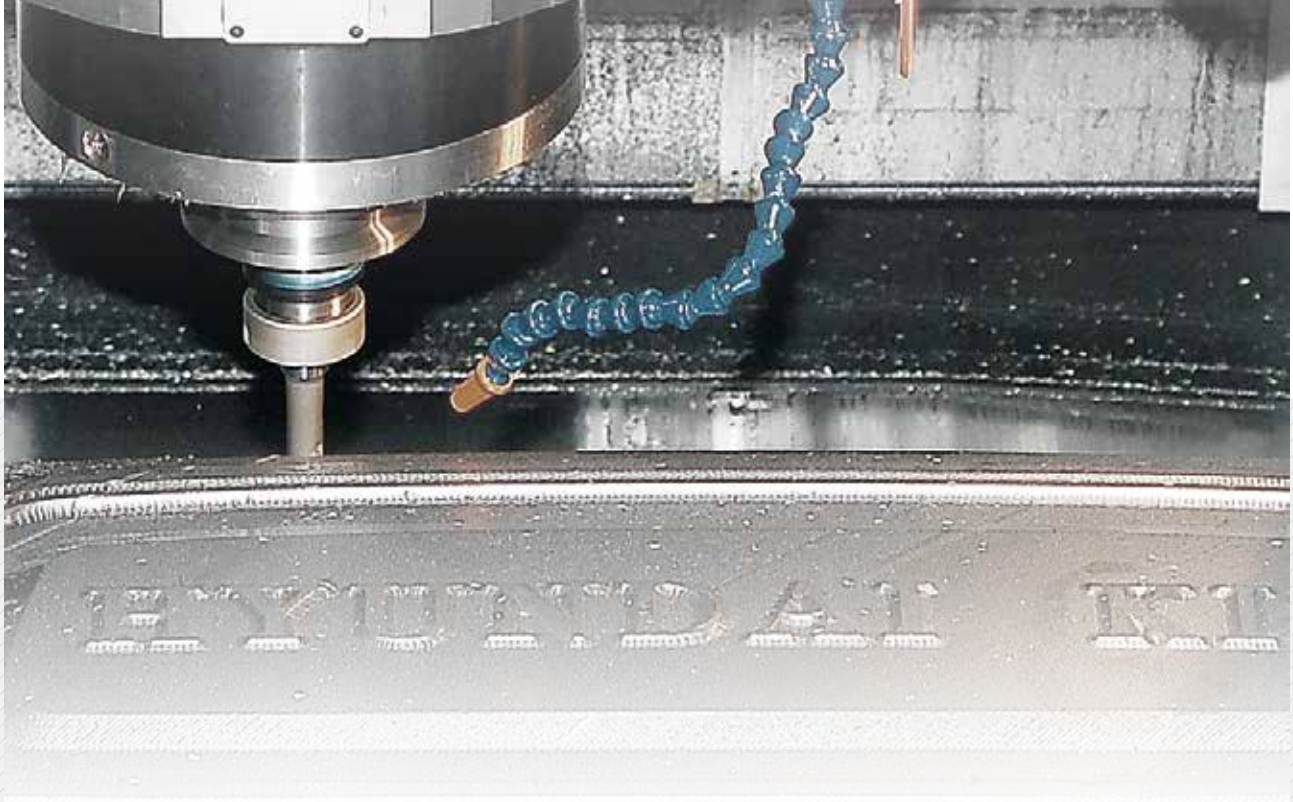
Through Spindle Coolant is exceedingly useful when drilling deep holes. It helps increase the lifetime of the tool, while decreasing cycle time.

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

### Spindle Cooling

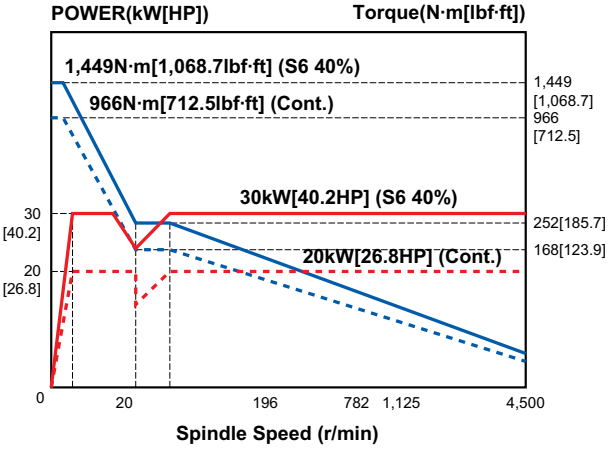
The spindle cooling system minimizes thermal displacement which can happen during lengthy machining operations, and offers continued accuracy based on the thermal stability.



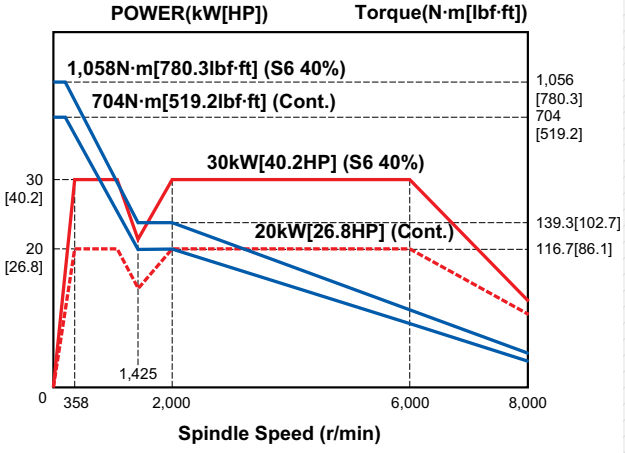


# HYUNDAI-iTROL

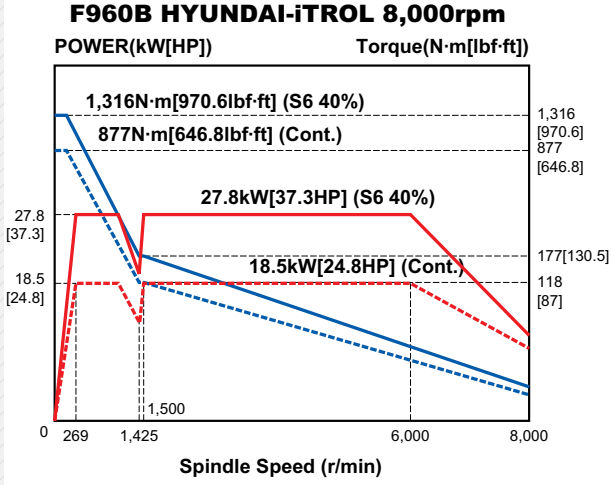
### F750B HYUNDAI-iTROL 4,500rpm




### F750B HYUNDAI-iTROL 8,000rpm




### F960B HYUNDAI-iTROL 8,000rpm

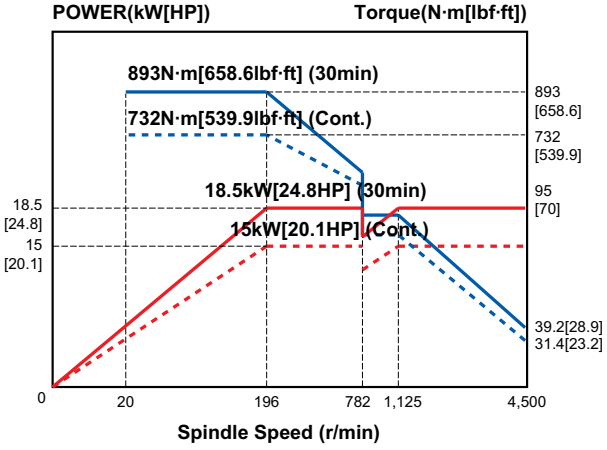



## SIEMENS 1PH8 Servo Motor

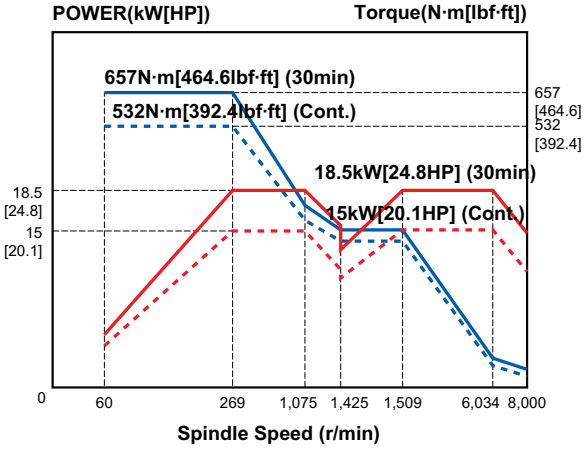
The 1PH8 Series is a high quality performance motor providing concentricity of 10㎛ and fast response time.

# FANUC Spindle Motor

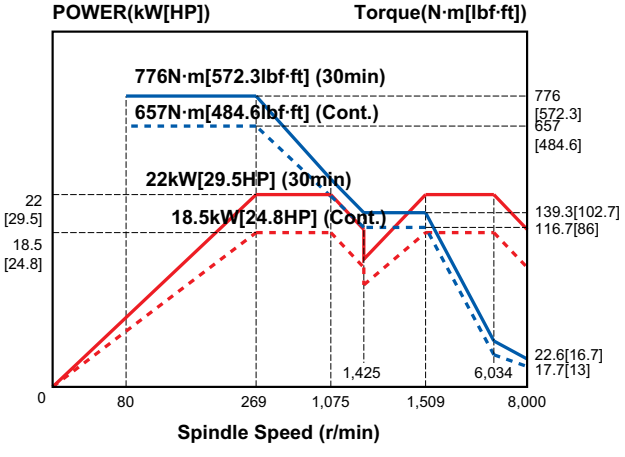
### F750B FANUC 4,500rpm




### F750B FANUC 8,000rpm



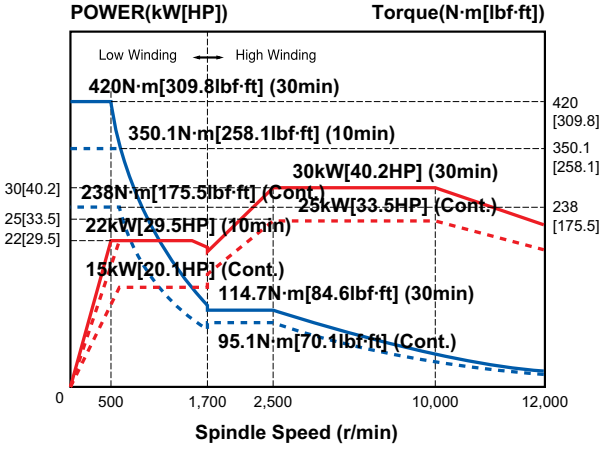

### F960B FANUC 8,000rpm




## Built-in Spindle OPTION

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

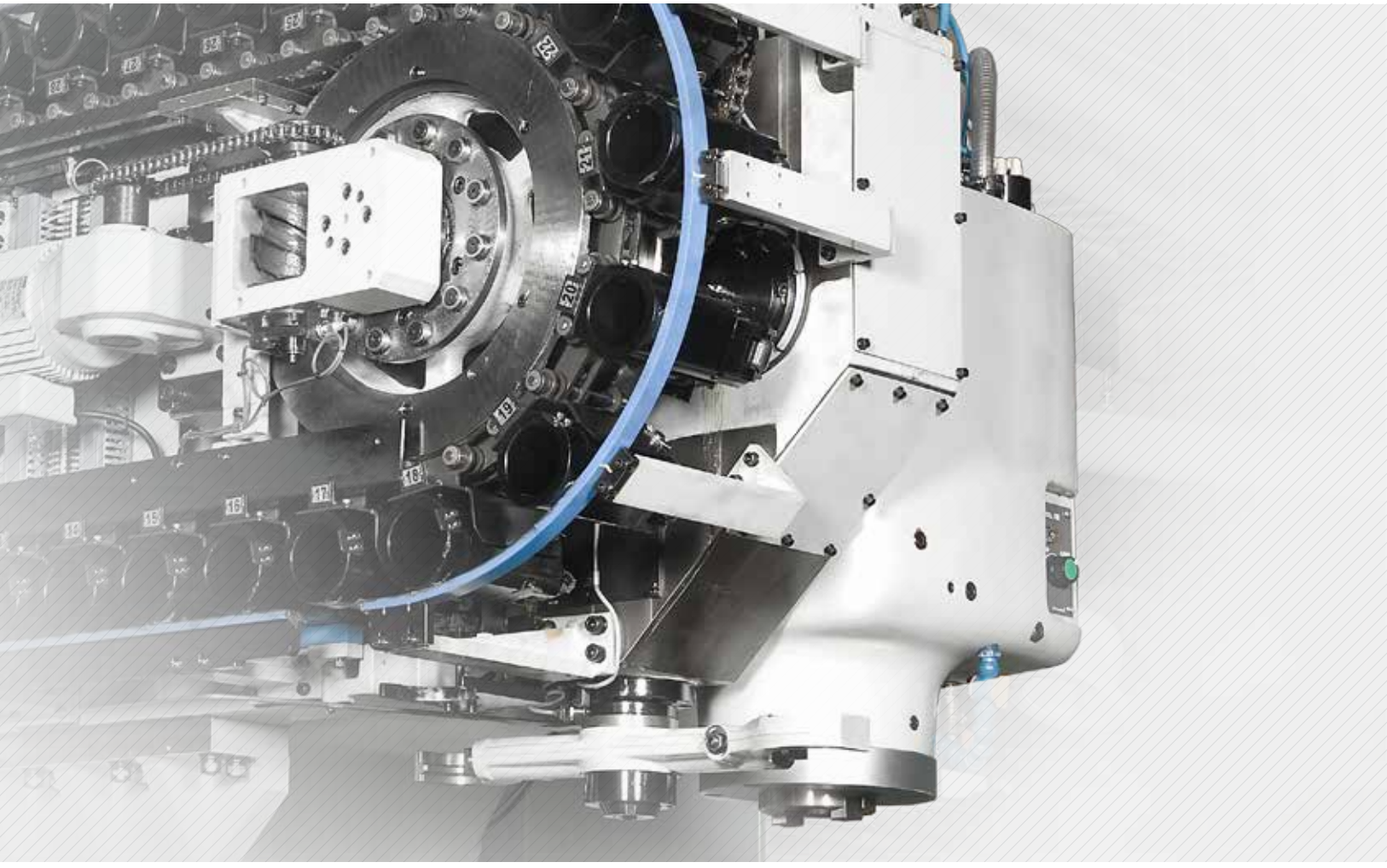
### F750B/960B FANUC 12,000rpm (Built-in)

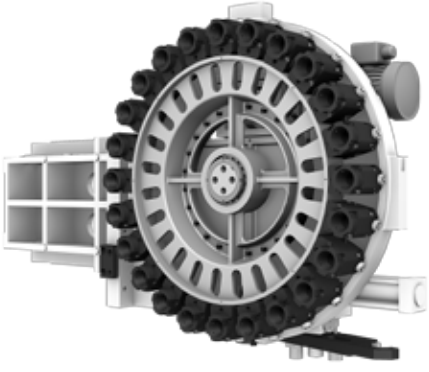


F750B/960B

# 04 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.



## 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 iRiS HYUNDAI WIA Smart Factory Solution

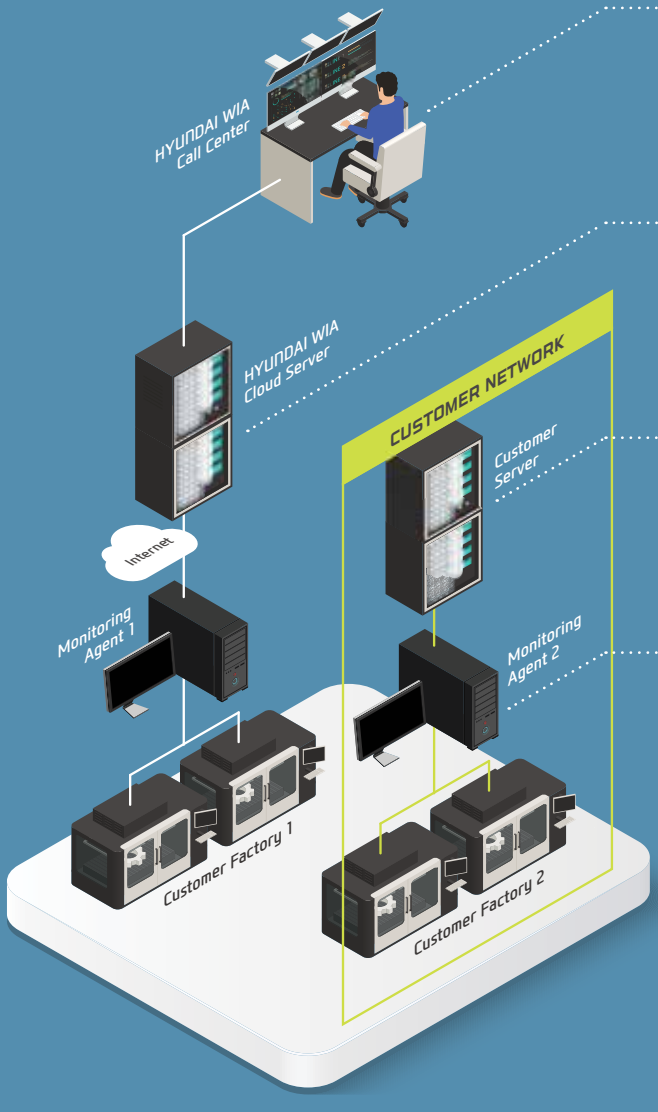
F750B/960B

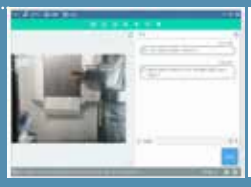
integrated Revolution of industrial Solution

## iRiS is HYUNDAI WIA's Smart Factory Solution.

iRiS, HYUNDAI WIA's revolutionary smart factory solution, consists of **Smart Monitoring System** for integrated management of HYUNDAI WIA machines around the world, and the **Smart Machining System** with ease, quality control, productivity and safety of the operator in mind.

## SMART MONITORING



### HW-MMS Remote
(Remote service based)

Hyundai Wia Call Center's remote diagnosis service provides a HMI/video diagnostic function.

### HW-MMS Cloud
(Cloud server based)

A cloud server-based equipment monitoring system for collecting and analyzing facility operation data.

### HW-MMS Edge
(Customer Server Based)

A customer server-based equipment monitoring system for collecting and analyzing facility operation data.

### HW-MMS Collector
(Machine data collector)

A dedicated program for collecting CNC data for MES/ERP.

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.

# SMART MACHINING

## HW-MCG

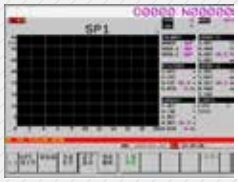
HYUNDAI WIA
Machine Guidance

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

## HW-TDC

HYUNDAI WIA Thermal
Displacement Compensation

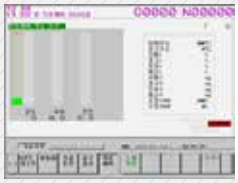
Software that measures the changes in the external environment as well as heat emission during processing to help reduce thermal displacement.



## HW-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.



## HW-AFC

HYUNDAI WIA
Adaptive Feed Control

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

## HW-MCS

HYUNDAI WIA Machining
Condition Selection

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

## HW-ESS

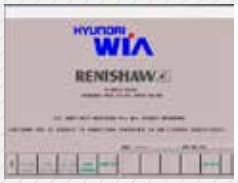
HYUNDAI WIA
Energy Saving System

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

## HW-WARMUP

HYUNDAI WIA
WARMing Up

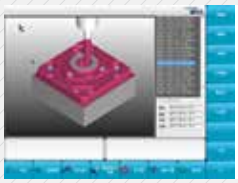
Warm-up software that measures main spindle halt and offers system warm-up time automatically.




## RENISHAW GUI

WorK / Tool Offset
Measurement

User-friendly GUI software for material coordinate system, tool length /diameter/breakage measurement (included in RENISHAW H/W set)



## HW-DPRO

HYUNDAI WIA
Dialogue PROgram

Software to create machining program easily and quickly through interactive operation


## HW-eDNC

HYUNDAI WIA ethernet
Direct Numerical Control

This software allows transmition 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.

06

# HYUNDAI - iTROL

The Powerful CNC platform for Machine Tools

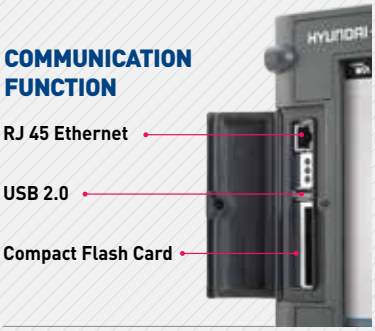
F750B/960B


## HYUNDAI Intelligent Control

**Convenient and Easy-to-Use Machine Tool...**

Hyundai WIA take operator convenience to a higher level with the new controller, HYUNDAI-iTROL. Experience the new operating environment with HYUNDAI-iTROL.

### COMMUNICATION FUNCTION




Easy input/output of programs is possible with the use of USB memory card, CF memory card and LAN.


Energy Saving & ECO System

### Energy Saving System

You can use energy saving function (ECO) and machining optimization function (SMART) with the MCP button.

### Combination of HYUNDAI-iTROL with Siemens servo drive and motor offers the optimum machine tool solution!

Dynamic servo control, highly efficient Siemens servo drive and Siemens servo motor with durability and quick response have been applied.

## Tool Monitoring, AFC

- The same tool monitoring function as the Fanuc HW-TM + new AFC
- Automatic transfer speed control
  - Expected benefits : Tool monitoring possible even when machining molds and prototype products, etc. Shortens the cycle time and protects the machine through an active control function

## Measuring System

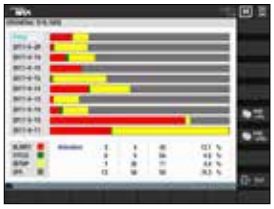
- Simplified UI by removing unnecessary screens
- Compatible with the standard Renishaw/Marposs as well as third-party TLM (the measuring program needs to be converted into TLM.SPF)
- Continuous measuring function to measure 10 tools at a time
- Tool data comparison (before and after measuring) and enhanced animation function

## Coordinate System Setting

- Quicker setting of coordinate system enabled by an improved UI (using the top-left coordinate system value)
- Parameter change process has been changed to "enter all and apply later" type to prevent the worker's erroneous entry
- Pre-defined coordinate value displayed in the bottom bed image for easier identification
- A 'Spindle rotation' button added for easier spindle rotation

## Engraving Setting

- Ability to engrave model name/serial number in mass production
- Available in the program edit window
- Text, quantity of work, working date, working time can be engraved and ordered
- Easily and quickly apply the engraved functions of Siemens CYCLE



## Monitoring of Operating Ratio

- Intuitive display uses distinctive colors to indicate the 4 stages of alarm, cycle, setup, and inactivity.
- Displays current activated status as "Activated".
- Options to export 10-day operation history as an NC file or to CF card (MS Excel compatible format)

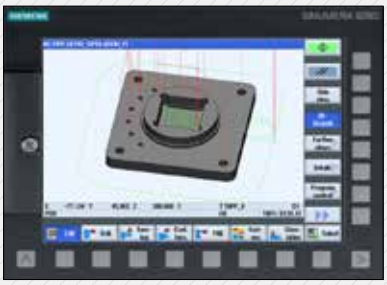
## Warming-up

- The mode selection path simplified with an improved UI
- Except Tool, Spindle RPM, Time, Program, the parameters not used frequently have been moved to 'Settings' screen.
- Messages for the current progress (%) and remaining time displayed at the top of the screen

## Shop Turn OPTION

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

## 3D Simulation OPTION



- 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 grogram during processing.

## ISO Code Programming

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

# 07 Mold Package

OPTION

F750B/960B

Powerful Mold Package,
HYUNDAI-WIA Mold All in One

## HWM ALL-IN-ONE

To enhance mold mahcining, the "HWM ALL-IN-ONE" is provided as an option feature for F750B/960B.

This ensures accurate and high quality surface finishing and contouring.

## Mold Package Specification (FANUC F31i-A / HYUNDAI-iTROL)

| HWM ALL IN ONE | | 1 Package (FANUC) | 2 Package (FANUC) | 3 Package (FANUC) | 4 Package (FANUC) | S Package (iTROL) |
|---|---|---|---|---|---|---|
| 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

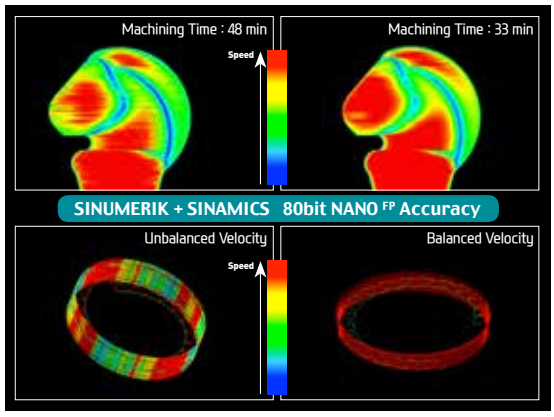
- **High Speed Contouring Control (AICC II)**
  Recognizes NC Data prior to the current processing phase
- **Optimal S/W (FANUC 31i-B Model)**
  **HW-MCS** (Selectable Process Conditions)
  **HW-AFC** (Adapive Feed Control)
- **Automatic Power Off**

- **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 caculation 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

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

| Spindle | | F750B | F960B |
|---|---|---|---|
| 4,500rpm (18.5/15kW [24.8/20.1HP) | FANUC | ● | – |
| 4,500rpm (30/20kW [40.2/26.8HP) | HYUNDAI-iTROL | ○ | – |
| 8,000rpm (18.5/15kW [24.8/20.1HP) | FANUC | ○ | – |
| 8,000rpm (30/20kW [40.2/26.8HP) | HYUNDAI-iTROL | ○ | – |
| 8,000rpm (22/18.5kW [29.5/24.8HP) | FANUC | – | ● |
| 8,000rpm (27.8/18.5kW [37.3/24.8HP) | HYUNDAI-iTROL | – | ○ |
| 12,000rpm Built-in (30/25kW [40.2/33.5HP) | FANUC | ○ | ○ |
| Spindle Cooling System | | ● | ● |
| **ATC** | | | |
| ATC Extension | 20 | ● | ● |
| | 30 | ○ | ○ |
| | 40 | – | ○ |
| Tool Shank Type | BBT50 | ● | ● |
| | BT50 | – | – |
| | CAT50 | ○ | ○ |
| U-Center | D'andrea | ○ | ○ |
| Pull Stud | 45° | ● | ● |
| | 60° | ○ | ○ |
| | 90° | ○ | ○ |
| **Table & Column** | | | |
| APC | Rorary Turn | – | – |
| Tap Type Pallet | | – | – |
| T-Slot Pallet | | ● | ● |
| NC Rotary Table | | ☆ | ☆ |
| High Column | 250mm(9.8") | ○ | – |
| | 200mm(7.8") | – | ○ |
| **Coolant System** | | | |
| Std. Coolant (Nozzle) | | ● | ● |
| Bed Flushing Coolant | | ● | ● |
| Through spindle coolant*1) | 20bar (290 psi) | ○ | ○ |
| | 30bar (435 psi), | ○ | ○ |
| | 70bar (1,015 psi) | ○ | ○ |
| 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) | | ☆ | ☆ |
| **Chip Disposal** | | | |
| Coolant Tank | 470ℓ (124.2 gal) | ● | – |
| | 690ℓ (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) | | ☆ | ☆ |
| 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 | ☆ | ☆ |

| S/W | | F750B | F960B |
|---|---|---|---|
| Machine guidance (HW-MCG) | | ● | ● |
| Tool Monitoring (HW-TM) : FANUC/HYUNDAI-iTROL | | ○/● | ○/● |
| DNC Software (HW-eDNC) | | ○ | ○ |
| Spindle Heat Distortion Compensation (HW-TDC) | | ○ | ○ |
| Spindle Warm up Function (HW-WARMUP) | | ● | ● |
| Energy Saving System (HW-ESS) | | ● | ● |
| Machine Monitoring System (HW-MMS) | | ○ | ○ |
| RENISHAW GUI | | ○ | ○ |
| Machining Condition Selection (HW-MCS) | | ● | ● |
| Adaptive Feed Control (HW-AFC) | | ● | ● |
| Conversational Program (HW-DPRO) | | ○ | ○ |
| **Electric Device** | | | |
| 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 | ○ | ○ |
| | HYUNDAI-iTROL | – | – |
| 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 *2) | | ○ | ○ |
| Back up Module for Black out | | ○ | ○ |
| **Measuring Device** | | | |
| 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) | | ☆ | ☆ |
| **Enviornment** | | | |
| 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 | ○ | ○ |
| | 2Axis | ☆ | ☆ |
| External M Code 4ea | | ○ | ○ |
| Automation Interface | | ☆ | ☆ |
| I/O Extension (In & Out) | 16 Contact | ○ | ○ |
| | 32 Contact | ○ | ○ |
| **Hyd. Device** | | | |
| Std. Hyd. Unit | 70bar (1,015 psi) / 13ℓ (3.4 gal) | – | – |
| Fixture Hyd. Unit | 45bar (652.7 psi) | ○ | ○ |
| | 70bar (1,015 psi) | ○ | ○ |
| | 100bar (1,450 psi) | ☆ | ☆ |
| | Customized | ☆ | ☆ |
| **ETC** | | | |
| Tool Box | | ● | ● |
| Customized Color | Need for Munsel No. | ☆ | ☆ |
| CAD&CAM Software | | ☆ | ☆ |

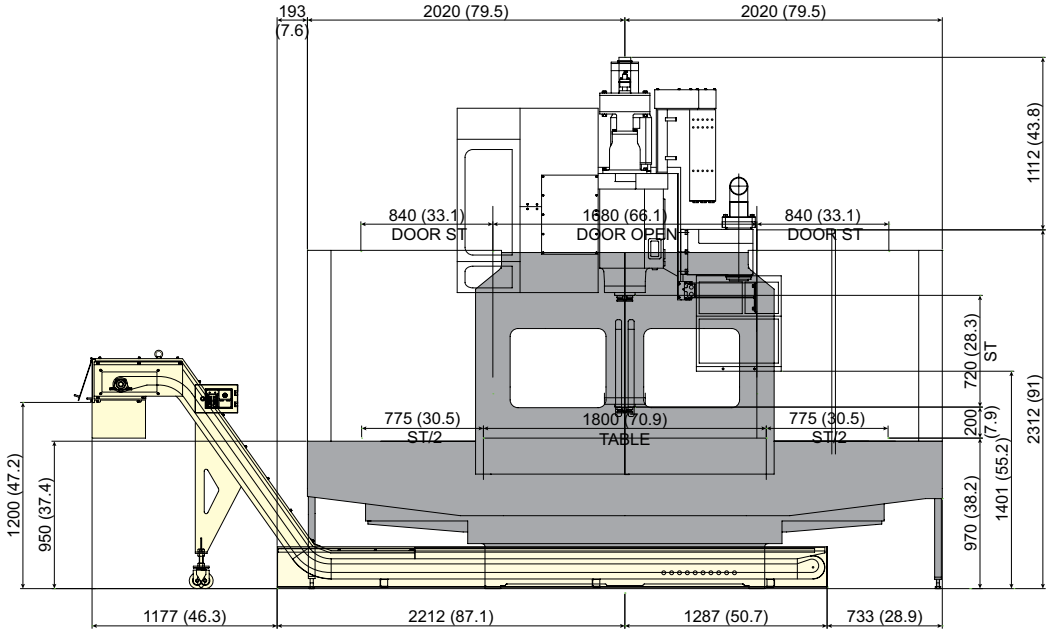
*1 : Please check the filter types with sales representative. / *2 : 12,000RPM Mold Package Standard

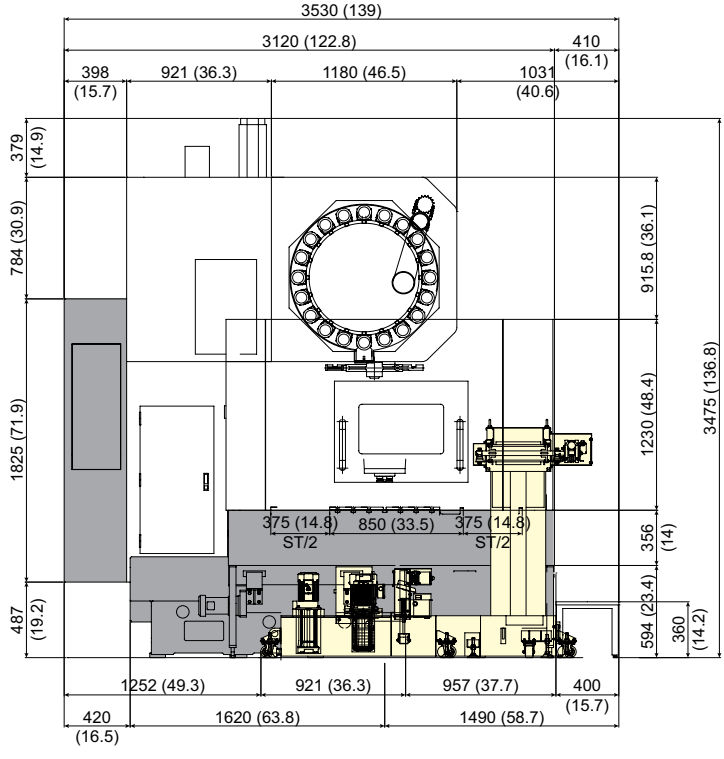
Specifications are subject to change without notice for improvement.

## External Dimensions

unit : mm(in)

### F750B



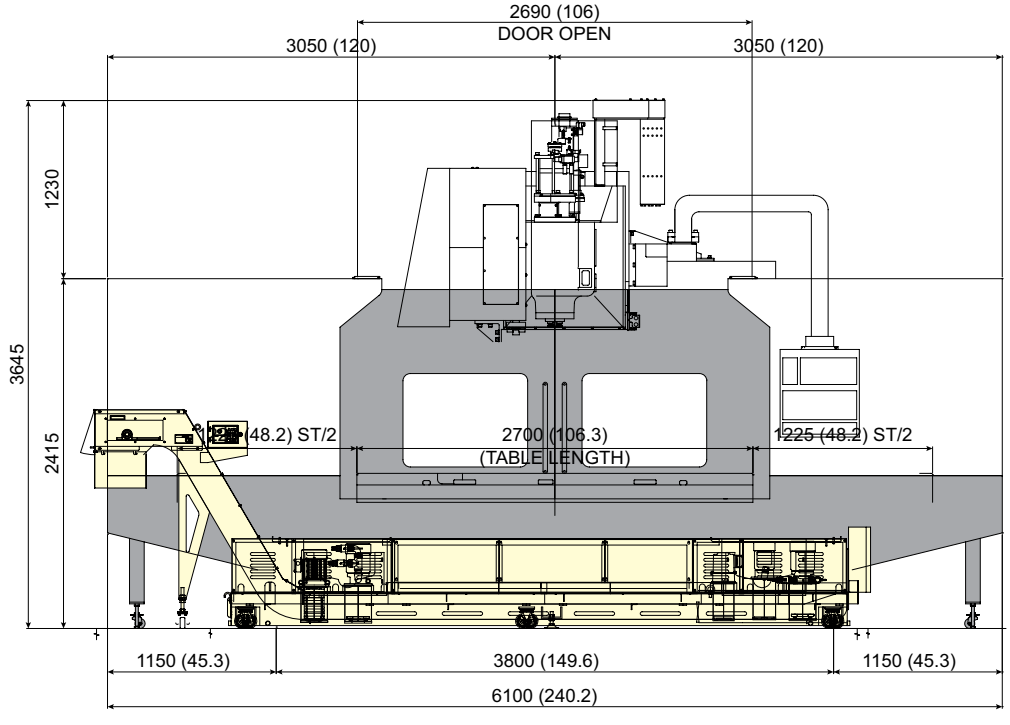



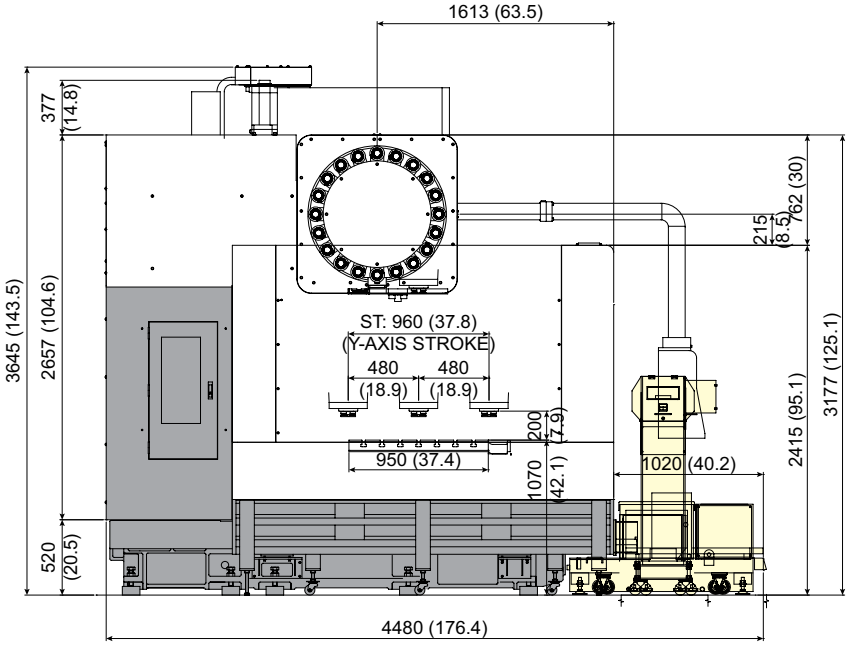
# SPECIFICATIONS

## External Dimensions

unit : mm(in)

### F960B

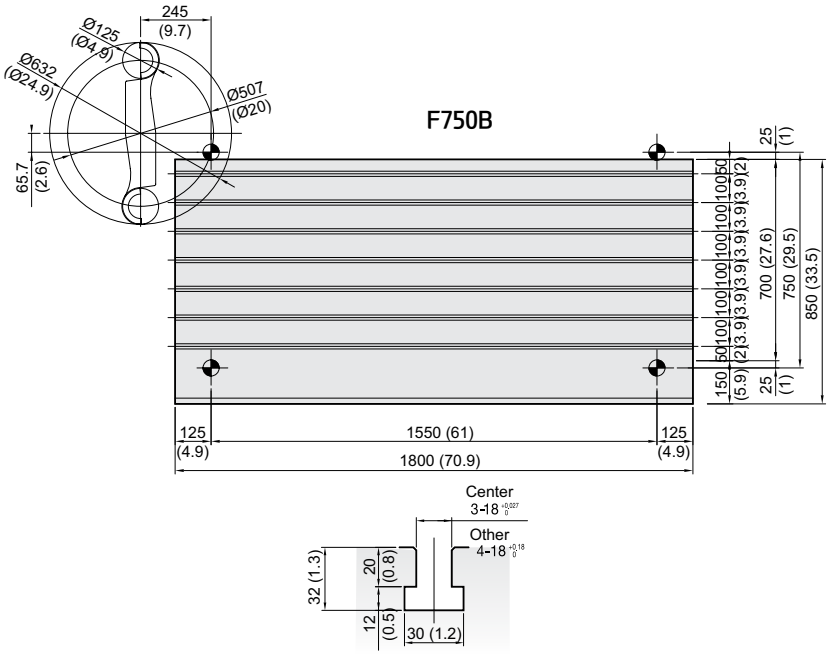


# SPECIFICATIONS

## Table Dimensions

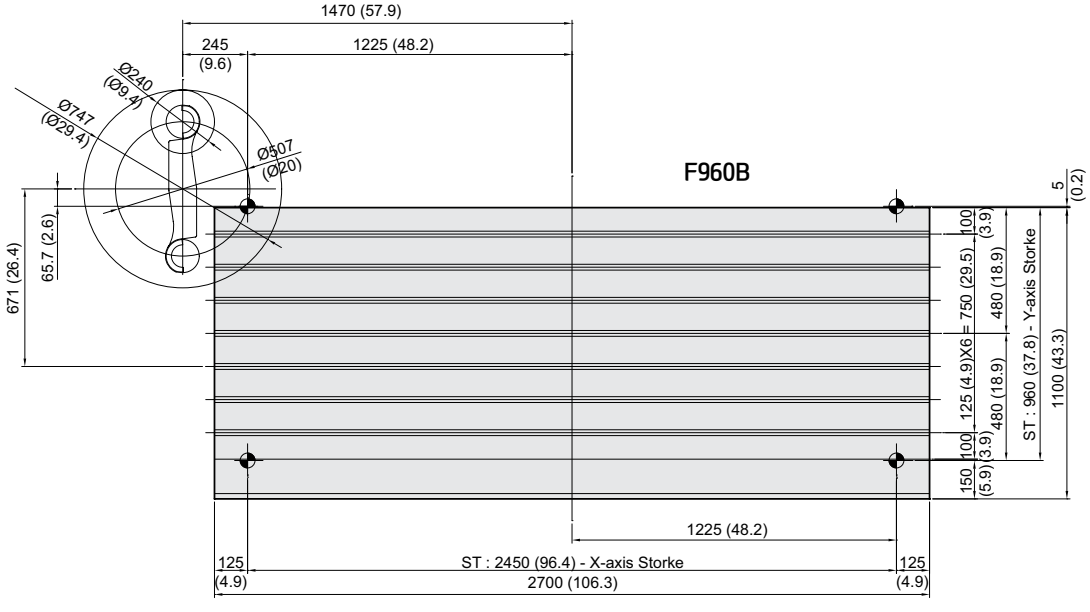
unit : mm(in)

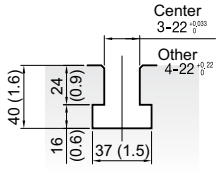






**T-Slot Detail**



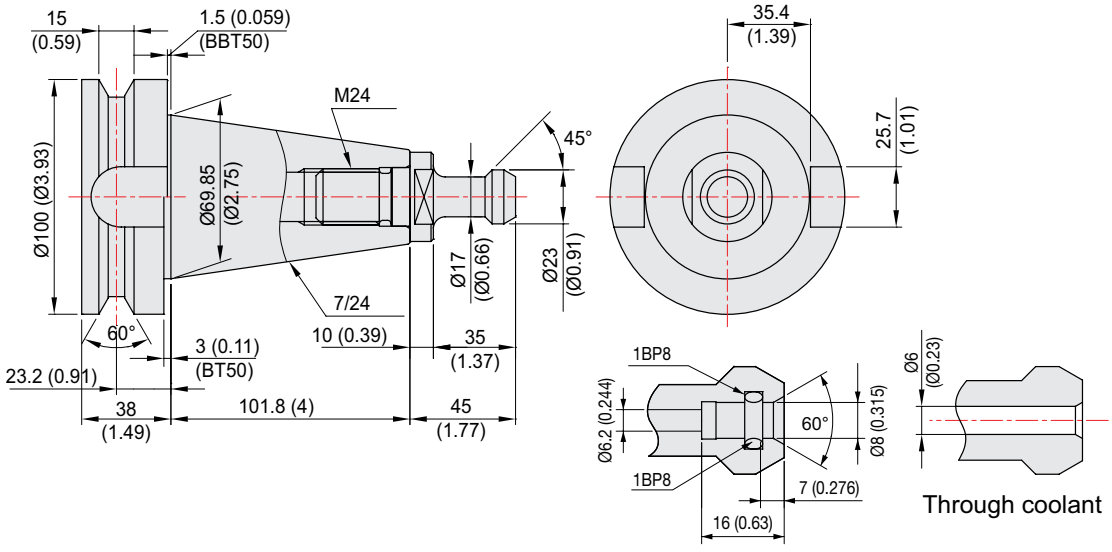

**T-Slot Detail**

# SPECIFICATIONS

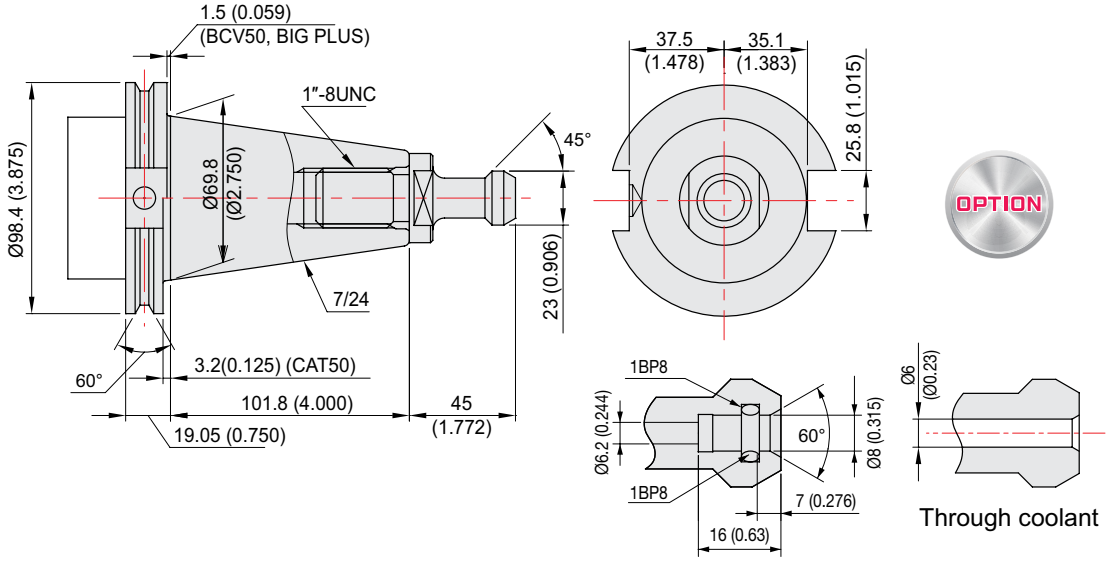
## Tool Shank

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 Top to SP. Nose | | mm(in) | 200 ~ 920 (7.9″ ~ 36.2″) [450~1,170 (17.7″ ~ 46.1″)] | 200 ~ 1,050 (7.9″ ~ 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 [BCV50] | |
| | 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″x139″) | 6,100×4,425 (240.2″x174.2″) |
| | Height | | mm(in) | 3,475 (136.8″) | 3,645 (143.5″) |
| | Weight | | kg(lb) | 13,000 (28,660) | 23,500 (51,809) |
| NC | Controller | | - | FANUC 31i-B [HYUNDAI WIA FANUC i Series] [HYUNDAI-iTROL] | |

*) 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

## 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<br>(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, Stroek check before move |
| Single block | |
| Search function | Program Number / Sequence Number |
| **Interpolation functions** | |
| Nano interpolation | |
| Positioning | G00 |
| Linear interpolation | G01 |
| Cylinderical 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/ridigity 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 |
| Cylinderical 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

## HYUNDAI WIA FANUC i Series

[ ] : 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<br>(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 axe Machine lock |
| | Stored limit check before move |
| Single block | |
| Search function | Program Number / Sequence Number |
| Handle interruption | |
| **Interpolation functions** | |
| Nano interpolation | |
| Positioning | G00 |
| Linear interpolation | G01 |
| Circular interpolation | G02, G03 |
| Exact stop mode | Single : G09, Continuous : G61 |
| Dwell | G04, 0 ~ 9999.9999 sec |
| Skip | G31 |
| Reference position return | 1st reference : G28 |
| | 2nd reference : G30 |
| | Ref. position check : G27 |
| Single direction positioning | G60 |
| Thread synchronous cutting | G33 |
| Helical interpolation | Circular + Linear 2 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 |
| Cylindrical interpolation | G07.1 |
| Inverse time feed | G93 |
| Look-ahead block | 20 blocks (AI APC) |
| **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, 48 pairs (G54.1 P1 ~ 48) |
| Manual absolute | Fixed ON |
| Programmable data input | G10 |
| Sub program call | 10 folds nested |
| Custom macro | #100 ~ #199, #500 ~ #999 |
| G code system | A |

| | |
|---|---|
| **Program input** | |
| Programmable mirror image | G51.1, G50.1 |
| G code preventing buffering | G4.1 |
| Optional chamfering corner R | |
| Polar coordinate command | G15, G16 |
| Scaling | G50, G51 |
| Coordinate system rotation | G68, G69 |
| **Auxiliary function / Spindle speed function** | |
| Auxiliary function | M 4 digit |
| Spindle speed function | S 5 digit , Binary output |
| Spindle override | 0% ~ 150% (10% Unit) |
| Spindle orientation | M19 |
| Retraction for rigid tapping | |
| FSSB high speed rigid tapping | |
| **Tool function / Tool compensation** | |
| Tool function | Max. T8 digit |
| Tool life management | |
| Tool offset pairs | 400 pairs |
| Tool nose / radius compensation | G40, G41, G42 |
| Tool length offset | G43, G44, G49 |
| Tool offset memory C | Tool geometry and wear (Cutter and tool length) |
| Tool length measurement | Z axe Input C |
| **Editing function** | |
| Part program storage size | 1280m (512KB) |
| No. of registerable programs | 400 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 & Operation | Alarm & Operator message & Operation |
| Run hour / Parts count display | |
| Maintenance information | |
| Actual cutting feedrate display | |
| Display of spindle speed / T code | |
| Graphic display | |
| Operating monitor screen | Spindle / Servo load etc. |
| Power consumption monitoring | Spindle & Servo |
| Spindle / Servo setting screen | |
| Multi language display | Support 20 languages |
| Display language switching | Selection of 5 optional Languages |
| LCD Screen Saver | Screen saver |

| | |
|---|---|
| **Option** | |
| Additional optional block skip | 9 ea ☆ |
| Fast ethernet | Needed option board |
| Data server | Needed option board |
| Protection of data at 8 levels | |
| Additional Axis | |
| Manual Guide i | Conversational auto program |
| Manual handle feed | 2/3 units |
| Addition of custom macro | #100 ~ #199, |
| | #500 ~ #999, #98000 ~ #98499 |
| Tool management function | |
| Part program storage size | 5120m (2MB) |
| No. registerable programs | Max. 1000 EA |
| Add. Workpiece | Max. 300 pairs (G54.1 P1 ~ P300) |
| AICC II | 40 blocks |
| | 200 blocks |
| | 400 blocks ☆ |

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

# CONTROLLER

## HYUNDAI-iTROL

| Control & Composition | |
|---|---|
| Number of axis/Spindles | 3 axis (X, Y, Z) |
| Number of axis/Spindles, max. | 6 axis (Axis + Spindle) |
| Color display | TFT 10.4" Color (800 x 600) |
| Keyboard | QWERTY Full Keyboard |
| Part program | 1MB, 3MB, 5MB |
| Addition of part program on CF card | |
| **Transfer Function** | |
| Feedrate override | 0% ~ 200% |
| Transfer value input range | ± 999999999 |
| Unlimited rotation of rotation axis | |
| Acc./Dec. with jerk limitation | |
| Measuring systems 1 and 2, selectable | |
| Travel to fixed stop | |
| Auto servo drive tuning | |
| **Spindle Function** | |
| Spindle override | 0% ~ 150% |
| Spindle speed, max. programmable value ange | 1000000 ~ 0.0001 |
| Automatic gear stage selection | |
| Spindle orientation | |
| Spindle speed limitation | |
| Rigid tapping | |
| **Interpolation** | |
| Linear interpolation axis, max. | 4 axis |
| Circle via center point and end point | |
| Circle via interpolation point | |
| Helical interpolation | |
| Non-uniform rational B splines | |
| Compressor for 3-axis machining | |
| Advanced surface | |
| **Program Function** | |
| Subroutine levels, max. | 11 |
| Interrupt routines, max. | 4 |
| Number of levels for skip blocks | 2 |
| Polar Coordinates | |
| Dimensions inch/metric, | |
| changeover manually or via program | |
| Dynamic preprocessing memory FIFO | |
| Look ahead | 50, 100, 150 |
| Absolute/Incremental command | G90 / G91 |
| Scaling/Rotation | |
| Read/Write system variables | |
| Block search | |
| Edit background | |
| Processing program number, max. | 750 |
| Using of CF Card, USB | |
| Basic coordinate number, max. | 1 |
| Work coordinate number, max. | 100 |
| Basic/Work coordinate programming change | |
| Scratching function | |
| Global and Local user data (GUD/LUD) | |
| Global program user data | |
| Interactive cycle program | |
| **Tool Function** | |
| Tool radius compensations | |
| Tool offset selection via T/D numbers | |
| Tools / Cutting edges in tool list | 80/160, 128/256, 256/512 |
| **Monitoring Function** | |
| Working area limit | |
| Software and Hardware limit | |
| Zero-speed/Clamping monitoring | |
| 2D/3D protection zones | |
| Contour monitoring | |

| Compensation | |
|---|---|
| Backlash compensation | |
| Leadscrew error compensation | |
| Measuring system error compensation | |
| Feedforward control (Speed control) | |
| **Safety Function** | |
| Safe torque off (STO) | |
| Safe brake control (SBC) | |
| Safe stop 1 (SS1) | |
| **Diagnostic Function** | |
| Alarm/Message , Alarm log | |
| PLC status/LAD online display | |
| PLC remote connection (Ethernet) | |
| **Automation Support Function** | |
| Actual velocity display | |
| Tool life management | As time / As amount |
| Work counter/Cycle time | Embedded |
| 2D simulation | |
| **Manual Operation** | |
| Manual handle/Jog transfer | |
| Manual measurement of workpiece / tool offset | |
| Automatic tool/Workpiece measurement | |
| Automatic/Program reference approach | |
| **Automatic Operation** | |
| Program run as using CF card/USB | |
| Program control/modification | |
| Block search | |
| Reposition | |
| Preset (Set actual value) | |
| **Data Transmission** | |
| Ethernet network | |
| USB memory stick & CF card | |
| **Convenience Function** | |
| Processing setting | Coordinate setting,<br>Auto tool length measurement |
| Processing support | Tool Monitoring, Spindle overload monitoring |
| Maintenance | Turret Guidance, I/O monitoring, Manual |
| Maintenance / Management | Soft MCP, Spindle warming-up<br>M/G code list |
| SMART machining | |
| Energy saving function (ECO) | |
| Machine Monitoring System (MMS Lite) | |
| **Language** | |
| Standard support language | Chinese Simplified, English, Korean |

| Option | |
|---|---|
| Maximum skip block number | 10 |
| DRF offset | |
| MDI program save/load | |
| Teach-In mode | |
| 3D simulation | Except for working area/Collision check |
| Real time simulation | |
| Shop Mill | Conversational Program |
| Spline interpolation | |
| Program remote control in network | |
| Language | Chinese Traditional, French, German,<br>Italian, Portuguese, Spanish |

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