

XF

2000i

High-speed & Small 5-axis Machining Center

HYUNDAI WIA 5-axis Machining Center

THE WORLD BEST

XF2000i the World's Top-Tier Horizontal Machining Center

At Germany's most prestigious **MM Awards ceremony**,

XF2000i won best machine in the milling segment

This result says it all.



Epilogue

Staffed with the world's top caliber researchers, the Hyundai WIA Europe R&D Center developed the XF2000i, a **simultaneously controlled 5-axis horizontal machining center**.

The R&D Center in Europe opened its doors in Germany in 2014, with the top priority emphasized on the execution of surprise and delight to the company's customers through the highest level of productivity and product quality.

Though the company has accomplished many great feats, its most notable achievement was receiving **the highest honor in the milling segment at the MM Awards** held in Hanover, Germany in 2017. The award symbolized the company's commitment to the global machine tool market, and in particular, the 5-axis technology.

XF 2000i

XF2000i, the world's top-tier 5-axis horizontal machining center, is the creation of the Hyundai WIA Europe R&D Center. With an integrated bed & column structure, it not only provides outstanding structural stability, but also delivers unrivaled productivity with the world's top-level acceleration/deceleration 1.2G by giving the linear feed axis extraordinarily powerful feed capabilities

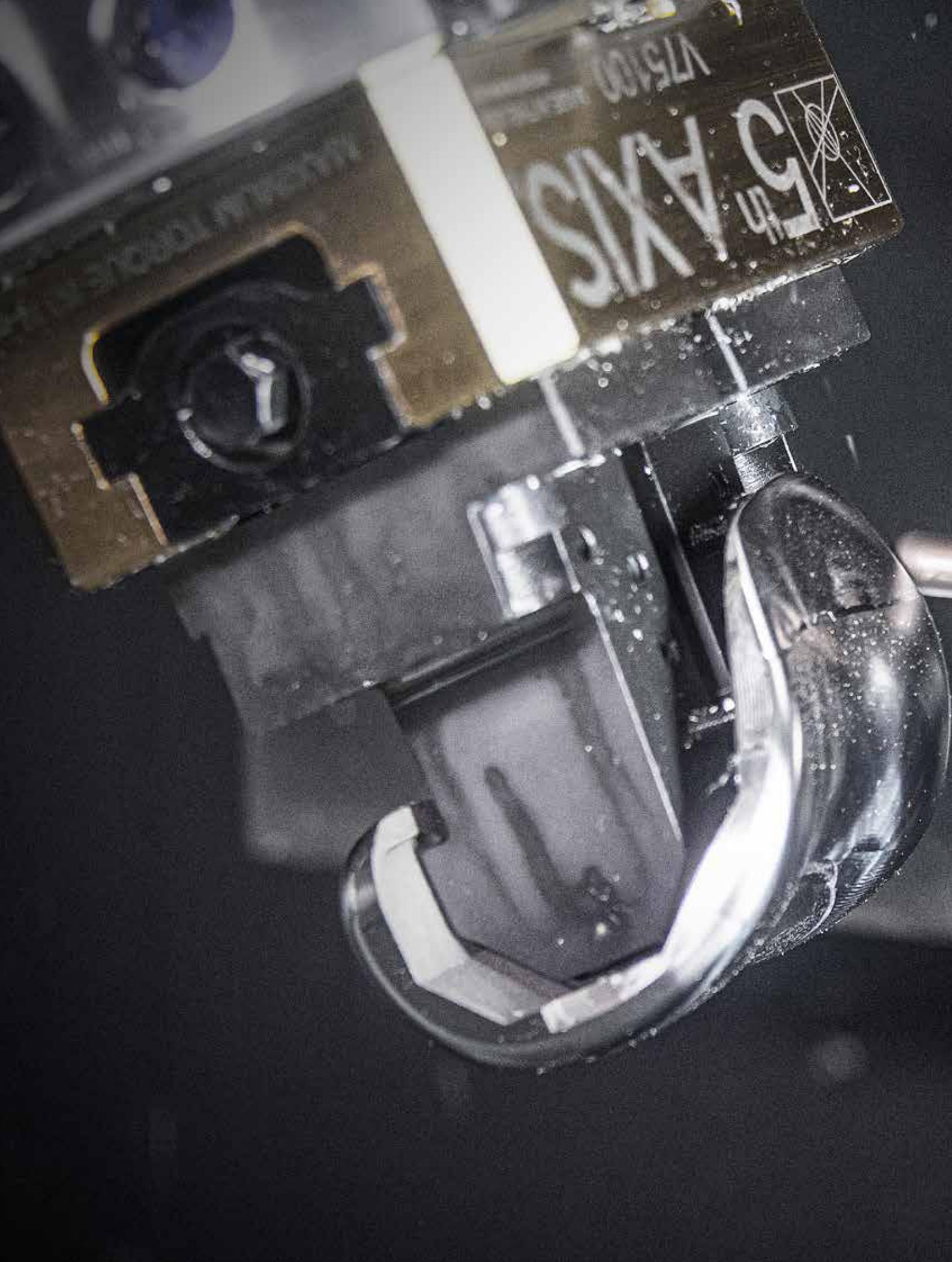
- Table Size : **Ø260 mm (Ø10.2")**
- Max. Load Capacity : **50 kg (110 lb)**
- Spindle Speed : **24,000 rpm**
- Spindle Output (Max./Cont.) : **12.5/8 kW (16.8/10.7 HP)**
- No. of Tools : **20 EA (Pick-UP) [40 EA (Chain)]**
- Travel (X/Y/Z) **300/300/200 mm (11.8"/11.8"/7.9")**
- Rapid Traverse Rate (X/Y/Z) **50/50/50 m/min (1,969/1,969/1,969 ipm)**



XF2000i
5-AXIS MACHINING CENTER

02
+
03

CREATING VALUE
IN SEAMLESS MOBILITY



5th AXIS

V75100



ULTRA PRECISION

The XF2000i is an optimized solution for small composite composite processing with the highest speed and precision in its class. To offer the company's customers the highest level of productivity, it is equipped with an efficient structure, backed by a monoblock type bed and a cantilever type DDM table.



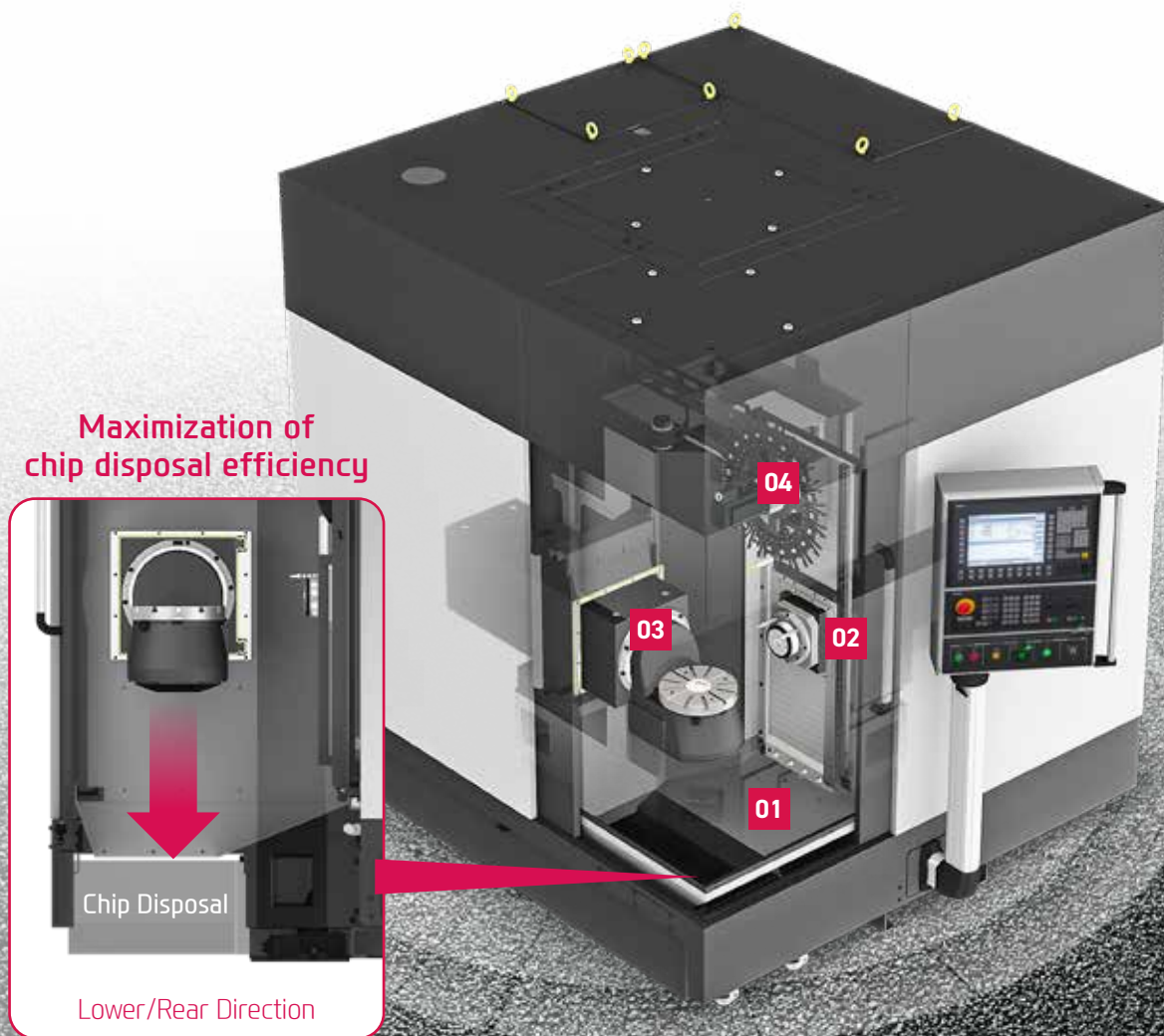
XF2000i
5-AXIS MACHINING CENTER

04
+
05

CREATING VALUE
IN SEAMLESS MOBILITY

XF2000i

Cutting Edge Technology



High Precision & Speed 5-Axis Machining Center

50/50/50 m/min (1,969/1,969/1,969 ipm)
Rapid Traverse Rate (X/Y/Z-axis)

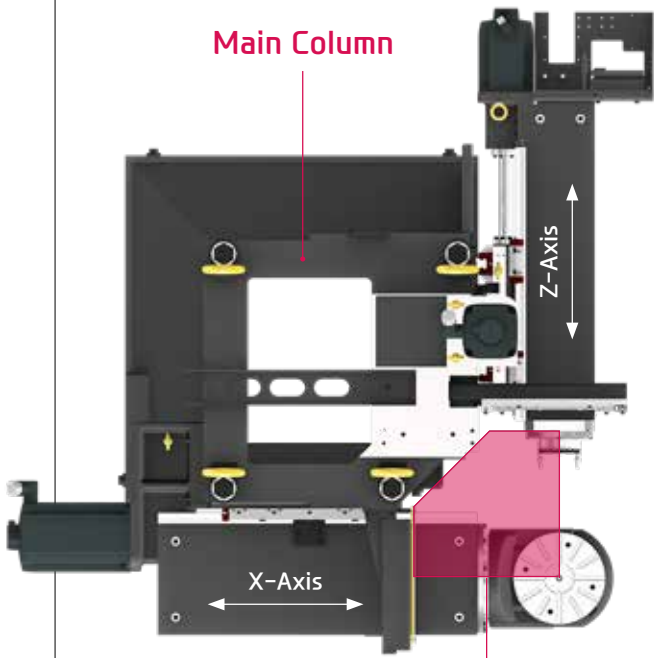
120/120 r/min
Rotation Speed (A/C-axis)

300/300/200 mm (11.8"/11.8"/7.9")
Travel (X/Y/Z-axis)

240/360 deg
Rotation Angle (A/C-axis)

Basic Features

01



Main Column

Z-Axis

X-Axis


Force Flow

One-piece Bed & Column

The XF2000i maximizes the dynamic rigidity by designing bed and column as an integral type, and improves the structural stability by concentrating the flow force between the work space and the tool.

Linear Scale (Std.)


Applied linear scale as a standard for high-precision machining through the compensation of thermal displacement.



02

Built-In Spindle


Designed with a built-in motor structure, the spindle provides maximum acceleration and deceleration while suppressing vibration and heat that can occur during the high-speed rotation. This leads to the excellent performance for high precision machining.



03

DDM Tilting Rotary Table


Precise 5-axis control can be done simultaneously by adopting DDM table, ensuring world-class travel speed to enhance productivity.



04

Pickup-type Magazine

Developed as a pickup-type magazine with a relatively simple structure, automatic tool loading device is unnecessary, which is excellent in maintenance.

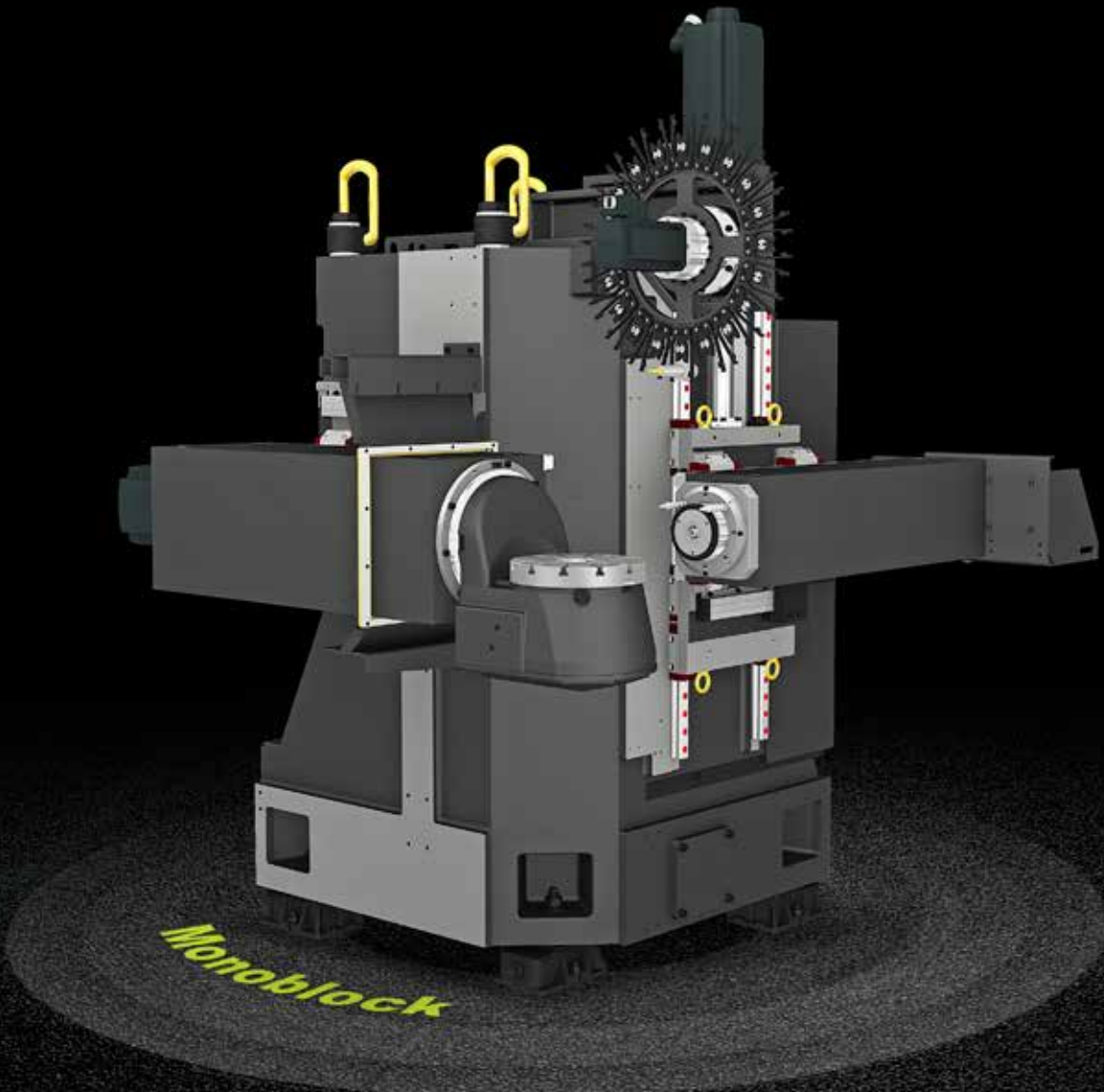


01

XF2000i

Basic Structure

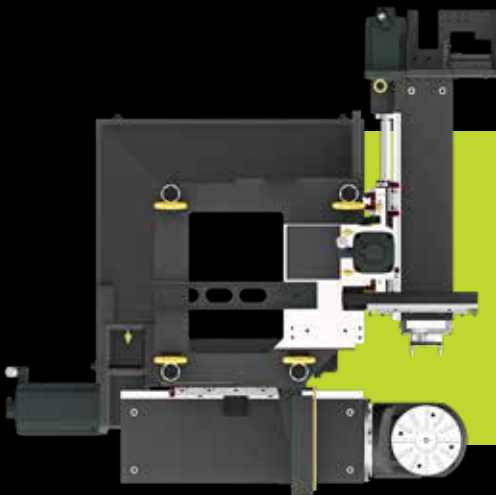
High-Precision & Speed 5-Axis Machining Center



XF2000i, a compact size high-speed, high-precision 5-axis machine developed by Hyundai WIA Europe R&D Center based in Germany, has optimized its structure to maximize its productivity. To complete the company's efforts toward a robust design, it applied a mechatronic simulation technique from initial design stage to maximize the mechanical performance of the machine tool.

The strength and rigidity of the base body structure are a direct link to the precision of a machine tool.

HYUNDAI WIA's advanced body design coupled with an integrated bed/column structure is the foundation of machining perfection.



- > A monoblock type high rigidity, integrated bed & column
- > Ensuring a robust design through mechatronics simulations
- > An optimized casting rib structure for high rigidity
- > The maximization of operational efficiency by horizontally arranging the main spindle and the table
- > The bed structure designed to optimize operators' accessibility



High-Speed Roller LM Guideway

Roller LM guide with high acc./deceleration and rigidity has applied to reduce non-cutting time.

◎ Acc./Deceleration Speed : **1.2G**



High-Precision Linear Scale (Standard)

The XF2000i are equipped with linear scales on all axes providing high precision positioning accuracy and compensates for ball screw thermal displacement ensuring extremely precise machining.

In addition, the absolute type linear scale is installed in close proximity to the ball screw of each axis. During operation an added benefit is not being require to home the machine.

02
XF2000i

RAM Type Spindle

Long Lasting High Accuracy & Excellent Performance
5-Axis Machining Center



Spindle

High-Precision Built-in Spindle

By using ultra precision angular ball bearings, fast acceleration and deceleration of the main spindle is achieved. The spindle head is designed to minimize the heat displacement of main spindle, and with the use of hydraulic tool lock system, the machining stability has increased.

Spindle Cooling

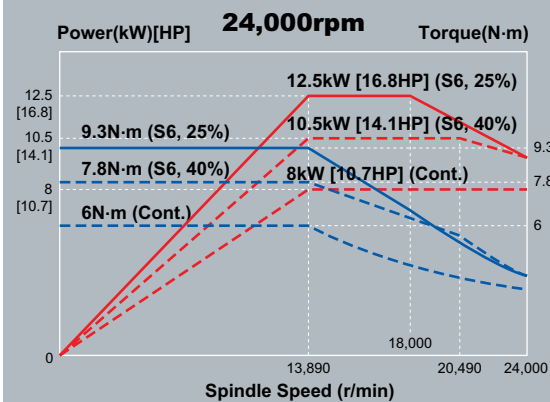
Spindle temperature is controlled by the use of a spindle oil chiller. This ensures consistent spindle temperature which minimizes thermal displacement.

HSK Tool Holder

HSK tool holder is utilized for precise positioning with less expansion in the spindle taper during high speed rotation. This ensures an excellent level of precision for die mold machining.



HSK-E40



Spindle Thru 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

24,000 rpm

12.5/8

kW (16.8/10.7 HP)
Spindle Power (Max./Cont.)

9.3/6

N·m
Spindle Torque (Max./Cont.)

03
XF2000i

Magazine & Table

Super Quality & Productivity
5 Axis Machining Center



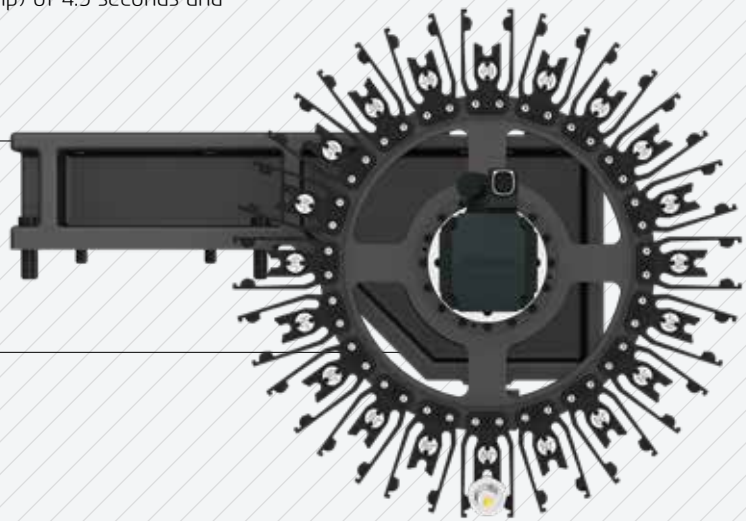
ATC & Tool Magazine

Automatic tool loading device with unnecessary pick-up type magazine achieves best-in-class tool change time (chip to chip) of 4.5 seconds and excellent maintainability.

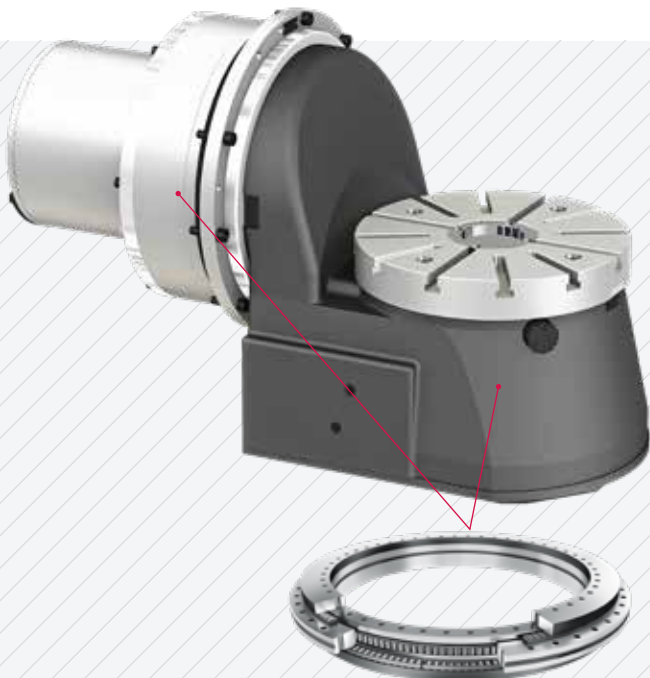
❖ 40 Tool Chain type Magazine Option

20 [40] ea
No. of tools

4.5 [5.0] sec
Tool change time (C-C)



- ⦿ Max. Tool Dia. : $\varnothing 50$ ($\varnothing 2''$)
- ⦿ Max. Tool Length : 150 mm (5.9'')
- ⦿ Max. Tool Weight : 1.5 kg (3.3 lb)



5-axis DDM Table

Precise 5-axis control can be done simultaneously by adopting DDM table, ensuring world-class travel speed to enhance productivity.

- ⦿ Table Size : $\varnothing 260$ ($\varnothing 10.2''$)
- ⦿ Load Capacity : 50 kg (110 lb)
- ⦿ Tilting Angle (A axis) : 240° ($+120^\circ \sim -120^\circ$)
- ⦿ Rotation Speed (A/C axis) : 120/120 rpm

A/C-axis Rotary Scale

High quality machining is achieved by scale built-in YRT bearing which is applied to the A/B-axis of rotary table.



FAST & DYNAMICS & CONVENIENCE

Highest level of acceleration and deceleration (FAST): Acc./Dec. time-1.2G

High performance built-in spindle (DYNAMIC)

High visibility programming and accessibility through its ergonomic design (CONVENIENCE)

Those are the values that the XF2000i pursues.



XF2000i
5-AXIS MACHINING CENTER

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+
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CREATING VALUE
IN SEAMLESS MOBILITY

04

XF2000i

SIEMENS Controller

The Powerful CNC Platform for Machine Tools



SIEMENS

**DIFFERENTIATED CAPABILITIES,
INTEGRATED ENGINEERING SEAMLESSLY INTERLINKED**

SIEMENS 840D sl is the latest generation CNC controller with the capability of running up to 20 axes on a single machine.

The powerful 80-bit controller reduces processing time and increases productivity. It supports the preparation of a variety of programs and setup functions for ease of operation.



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



Real Time 3D Simulation

- Real time 3D simulation is possible
- 2D simulation offered standard
- Possible to confirm NC program thru simulation



Easy Screen

- Create an easy screen
- Insert text and pictures
- Max. 5-screen configuration
- PLC variables and PLC interface with read/write support



SIEMENS MDynamics



SIEMENS MDynamics is required for a variety of CNC mold processing software solutions which is combined into one package achieving the highest processing rates

ISO Code Programming



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

SPECIFICATIONS

Standard & Optional

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

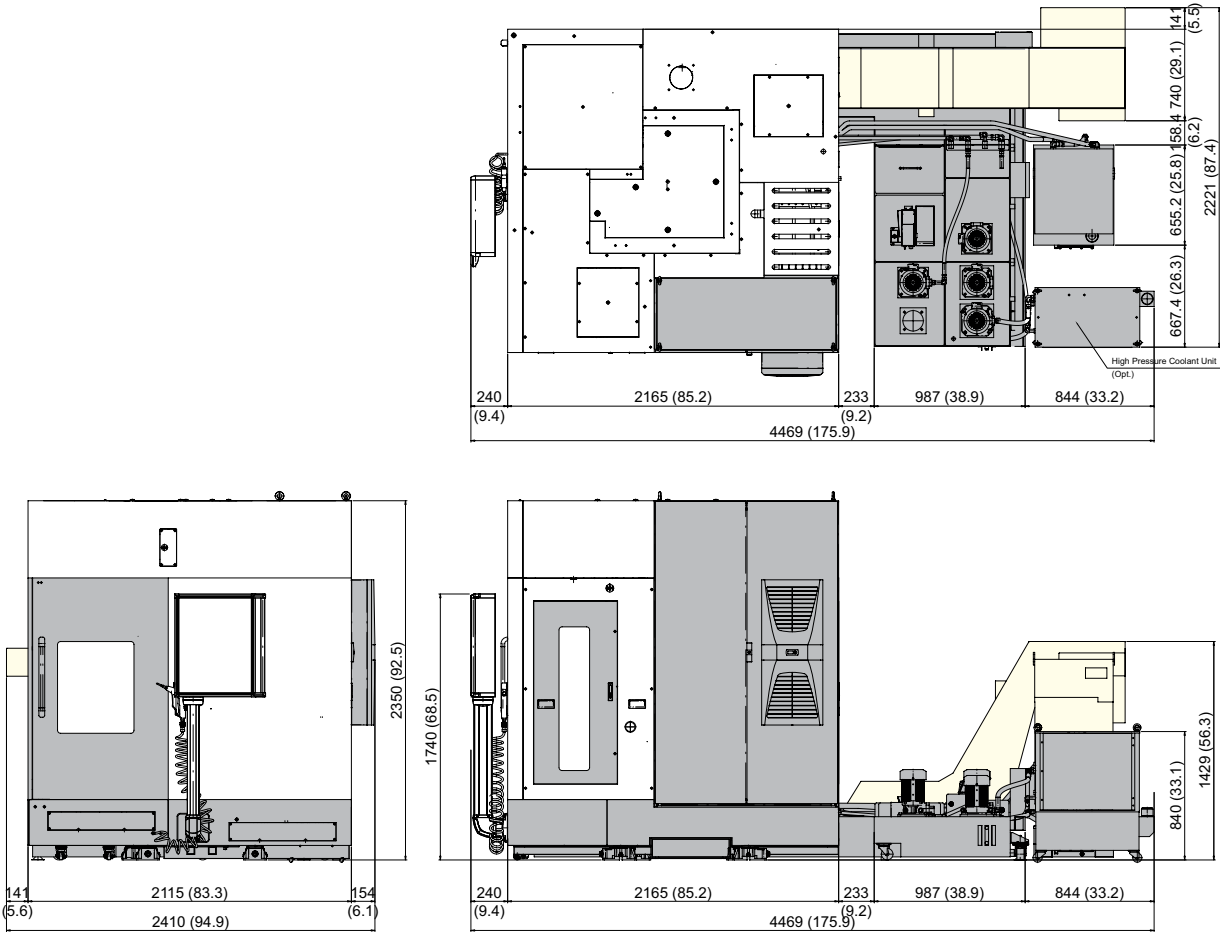
Spindle		XF2000i
24,000rpm	Built-in	●
Spindle cooling system	WATER Chiller	●
ATC		
ATC extension	20EA (Pick-UP Type)	●
	40EA (Chain Type)	○
Tool shank type	HSK E40	●
Tool weight	1.5kg (3.3 lb)	●
Servo motor drive magazine		●
Table, APC & Pallet		
T-slot type pallet		●
Impeller type pallet		☆
Coolant System		
Std. coolant (Nozzle+Bed)		●
Shower coolant (Niagara)		○
Through spindle coolant (25 ℓ (6.6 gal))	20bar (290 psi)	○
	30bar (435 psi)	○
	70bar (1,015 psi)	○
Gun coolant		○
Air gun		○
Spindle air blow		○
Tool measuring air blow (Selected Tool measuring Device)		○
Coolant cooling device		○
Thru MQL device (without MQL)		☆
Air blow (for automation)		☆
Power coolant system (for automation)		☆
Chip Disposal		
Coolant tank	470 ℓ (124 gal) -High Level	●
Chip conveyor (Hinge/Scraper)	Rear	○
Chip wagon	Standard (180 ℓ [47.5 gal])	○
	Swing (200 ℓ [52.8 gal])	○
	Large Swing (290 ℓ [76.6 gal])	○
	Large Size (330 ℓ [87.2 gal])	○
	Customized	☆
Controller		
SIEMENS 840Dsl		●
S/W		
Automatic CAM (HW-ACAM)		-
Dialogue Program (HW-DPRO)		○ (3+2 axis support)
DNC software (HW-eDNC)		○
Machine Monitoring System (HW-MMS Cloud)		☆
Machine Monitoring System (Customer Installation : HW-MMS Edge)		☆
Smart Guide-i : FANUC		-
Smart S/W		☆

ETC		XF2000i
Tool box		●
Customized color	Need for Munsel No.	☆
CAD & CAM software		☆
Total splash guard		●
Electric Device		
Call light & buzzer	3color : ● ■ ■ B	●
Work light		●
Electric cabinet light		○
Front door interlock		●
Side door interlock (Selected side auto door)		○
Remote MPG		●
3 axis MPG		○
Transformer (220V/380V)	40/10kVA	●
Spindle load meter	LED	○
Spindle speed meter	LED	○
Work counter	Digital	○
Total counter	Digital	○
Tool counter	Digital	○
Multi tool counter	6ea	○
	9ea	○
Auto power off		○
Splash memory card		○
Back up Module for Black out		○
AVR (Auto Voltage Regulator)		☆
Measuring Device		
Air Zero (Selected impeller table)	FESTO	●
	SMC	○
Work Measuring Device		○
TLM	Touch	☆
	Laser	○
Tool Broken Detective Device		○
Linear Scale	X/Y/Z Axis	●
Rotary Scale	A/C Axis	●
Coolant Level Sensor (Only for Chip Conveyor, Bladder Type)		☆
Environment		
Air Conditioner		●
Dehumidifier		○
Oil Mist Collector		○
Oil Skimmer (Only for Chip Conveyor)		○
MQL (Minimal Quantity Lubrication)		☆
Fixture & Automation		
Auto door	Side	○
Sub operation pannel		☆
Control of Additional Axis	1 Axis	○
	2 Axis	○
External M code 4ea		○
Automation interface		○
I/O extension (In & out)	4 contact	○
	16 contact	○
Hyd. Device		
Std. hyd. unit	100bar (1,450 psi) / 4 ℓ (1 gal)	●
	45bar (653 psi)	☆
Hyd. unit for fixture	70bar (1,015 psi)	☆
	100bar (1,450 psi)	☆
	Customized	☆

SPECIFICATIONS

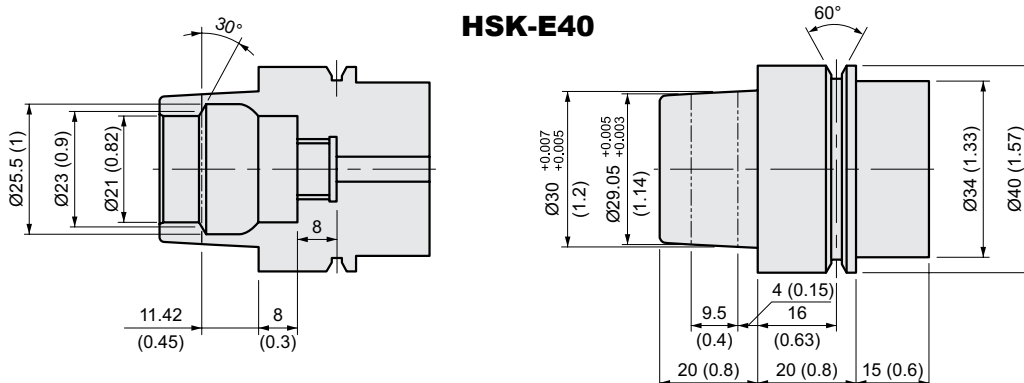
External Dimensions

unit : mm (in)



Tool Shank

unit : mm (in)

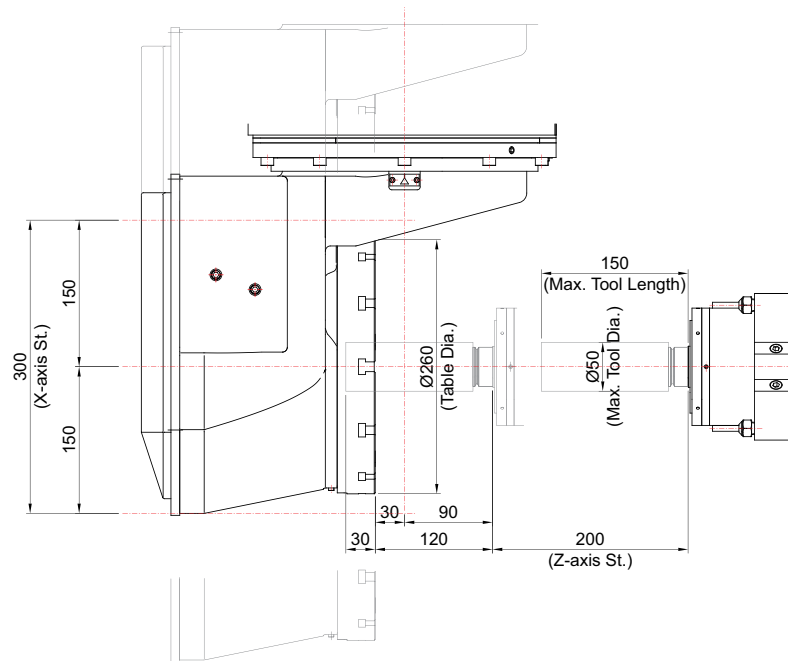


SPECIFICATIONS

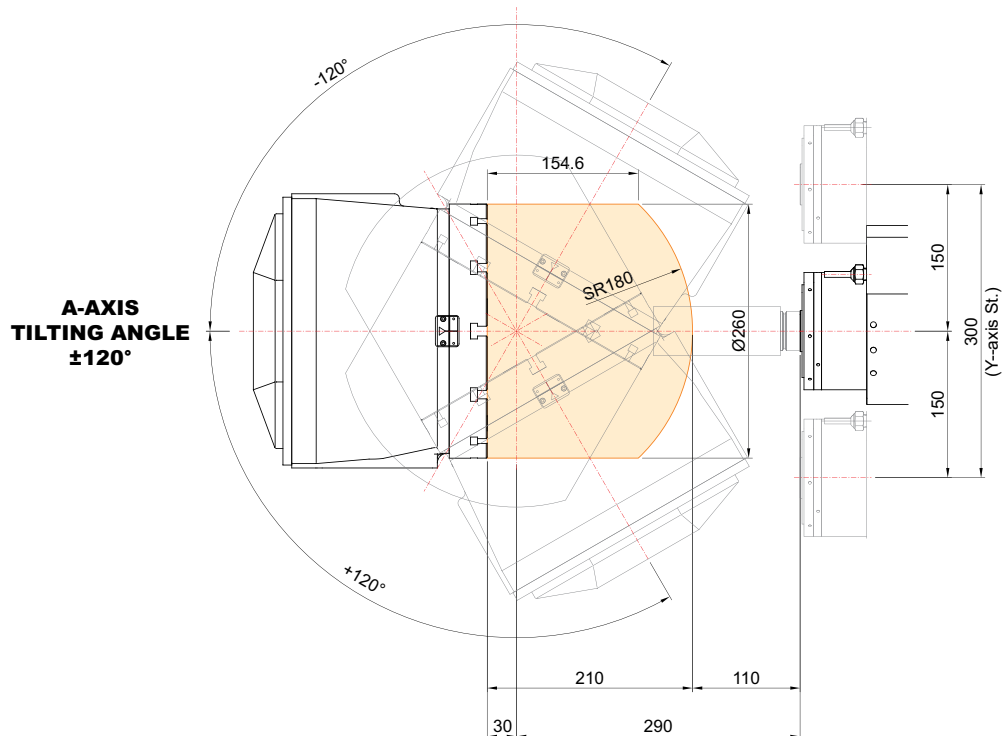
Table Dimensions

unit : mm (in)

Tilting : A-axis 0° (T-SLOT TABLE)



(A-AXIS CENTER)



SPECIFICATIONS

Specifications

[]: Option

MODEL			XF2000i
TABLE	Table Size	mm(in)	Ø260 (Ø10.2")
	Maximum Load Capacity	kg(lb)	50 (110)
	Max. Macining Height	mm(in)	210 (8.3")
	Table Driving Method	mm(in)	DIRECT DRIVE MOTOR
SPINDLE	Spindle Taper	-	HSK-E40
	Spindle RPM	r/min	24,000
	Spindle Power Output (Max./Cont.)	kW(HP)	12.5/8 (16.8/10.7)
	Spindle Torque (Max./Cont.)	N·m	9.3/6
	Spindle Driving Method	-	BUILT-IN
FEED	Travel	X/Y/Z Axis mm(in)	300/300/200 (11.8"/11.8"/7.9")
	Rotation Angle	A/C Axis deg	240° (-120°~+120°)/360°
	Distance from Table Top to SP. Nose	mm(in)	-150 ~ 150 (-5.9 ~ 5.9)
	Rapid Traverse Rate	X/Y/Z Axis m/min(ipm)	50/50/50 (1,969/1,969/1,969)
	Rotation Speed	A/C Axis r/min	120/120
	Feed Axis Acc./Dec. Speed	G	All-axis 1.2
	Slide Type	-	ROLLER GUIDE
ATC	Number of Tools	ea	20 : Pick up Type [40 : Chain Type]
	Tool Shank	-	HSK-E40
	Max. Tool Dia. (W/T Adjacent Tool)	mm(in)	Ø50 (2")
	Max. Tool Length	mm(in)	150 (5.9")
	Max. Tool Weight	kg(lb)	1.5 (3.3)
	Tool Change Time	C-C sec	4.5 : Pick up Type [5.0 : Chain Type]
	Tool Selection Method	-	FIXED
TANK CAPACITY	Coolant Tank	ℓ (gal)	470 (124)
	Lubricating Tank	ℓ (gal)	2 (0.5)
	Hydraulic Tank	ℓ (gal)	3.9 (1)
POWER SUPPLY	Electric Power Supply	KVA	40
	Thickness of Power Cable	mm ²	25 (AC 380V), 35 (AC 220V)
	Voltage	V/Hz	380,220/50,60
MACHINE	Floor Space (L×W)	mm(in)	2,410×4,469 (94.9"×175.9)
	Height	mm(in)	2,350 (92.5)
	Weight	kg(lb)	6,000 (13,228)
CNC	Controller	-	SIEMENS 840D sl

XF2000i
5-AXIS MACHINING CENTER

20
+
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CREATING VALUE
IN SEAMLESS MOBILITY

CONTROLLER

SIEMENS 840D sl Standard

[] : Option ☆ Needed technical consultation

Controlled axis / Display / Accuracy Compensation

Control axes	7 axes (X1, Y1, Z1, A1, C1, WR, AD)
Simultaneously controlled axes	Max. 5 axes
Least setting Unit	X, Y, Z axes : 0.001 mm (0.0001 inch), B, C, A axes : 0.001 deg
Least input increment	X, Y, Z axes : 0.001 mm (0.0001 inch), B, C, A axes : 0.001 deg
Inch / Metric changeover	G70 (inch) / G71 (metric)
Interlock	All axes / Each axis
Machine lock	All axes
Backlash compensation	
Pitch error compensation	
Feedforward control (Torque control)	
LCD / MDI	12 inch color LCD
Keyboard	ABCD Type
Stored stroke check	Over travel

Operation

Automatic operation (Memory)	
MDI operation	
Program restart	
Program check function	Dry run / Program check / Machine lock
Single block	
Block search	Block search
Reposition	
Working area limit	Working area limitations

Interpolation functions

Positioning	G00
Linear interpolation	G01
Circular interpolation	Circular interpolation CW (G02) Circular interpolation CCW (G03)
Exact position stop	Single block exact stop (G09) Exact stop G60 (G601, G602, G603)
Dwell	Dwell (G04)
Reference position return	Return to reference point Return to 2nd reference point
Helical interpolation	
Spline interpolation	Non-uniform rational B splines
Compressor (Improving machining quality)	CompCAD / CompCurv (Cycle 832)

Feed function / Acc. & Dec. control

Manual feed	Rapid traverse Jog Manual handle Reference position return
Cutting Feed command	Direct input F code
Feedrate override	0 ~ 120%
Rapid traverse override	1%, 25%, 50%, 100%
Feed per minute	G94
Feed per revolution	G95
Look-ahead block	3,000 block (With Mdynamics)

Program input

ISO correspondence	G291(ISO)/G290 (SIEMENS) (ISO G Code system-A)
Optional block skip	8 ea (0~7)
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, X-Z : G18, Y-Z : G19 G54 ~ G57, G505~G549
Workpiece coordinate system	G500 (Basic frame - settable zero offset) G53 (Work offset non modal) G153 (basic frame non modal)
Sub program call	16 folds nested
G code preventing buffering	STOPRE
Drilling/Milling cycle	with programing support
User cycle	

Auxiliary function / Spindle speed function

Auxiliary function	M Code 4 digit
Spindle speed function	S Code 5 digit
Spindle override	0% ~ 120%
Spindle orientation	SPOS
Rigid tapping	
Automatic mode Interchange	Spindle / Axis mode
Constant surface speed control	G96, G97
Spindle speed limitation	LIMS

Tool function / Tool compensation

Tool function	Tool number & Tool name
Tool life management	
Tools in tool list	1,500 ea
Cutting Edges in tool list	3,000 ea
Tool radius compensation	ISO (G40, G41, G42)
Geometry / Wear compensation	
Measurement of tool length	
Tool management function	

Editing function

Part program storage size	10MB
External Storage devices	USB
Background editing	
Extended part program editing	Copy, move and change of NC program
Memory card program edit	

Data input / output & Interface

I/O interface	USB memory interface Embedded Ethernet memory interface
Screenshot	

Setting, display and diagnosis

Self-diagnosis function	
History display & Operation	Alarm & Operator message & Operation
Run hour / Parts count display	
Regular maintenance screen	
Actual speed display	
Display of spindle speed / T code	
Graphic display	
Operating monitor screen	Spindle / Servo load etc.
Multi language display	Support 7 languages Chinese, English, French, German, Italian, Korean, Spanish
LCD Screen Saver	Screen saver & Motion sensing

Function

ShopMill	Machining step programming for milling
3D simulation	
Real time simulation	

Option

Built-in PC	Industrial PC (IPC427E)
Multi language display	☆ 20 Support languages : Inquiry need

Figures in inch are converted from metric values.

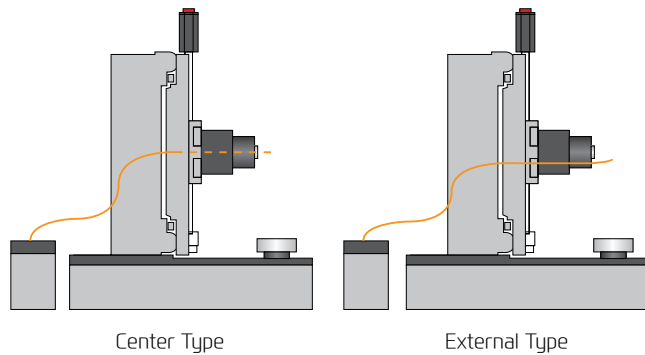
The SIEMENS controller specifications are subject to change based on the policy of company CNC supplying.

HYUNDAI WIA ECO SYSTEM

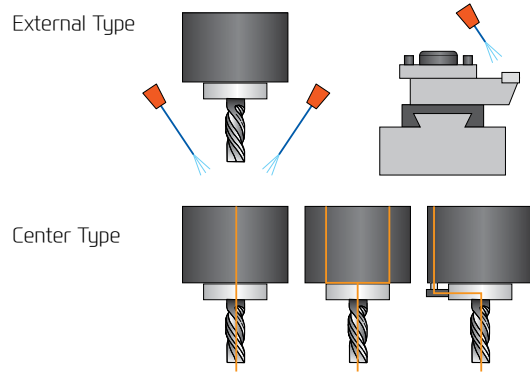
MQL (Minimal Quantity Lubrication)

The goal of this system is to spray only the amount of lubricant required to prevent heat and chip build up at the cutting tool or work piece face.

Example of Machining Center Application



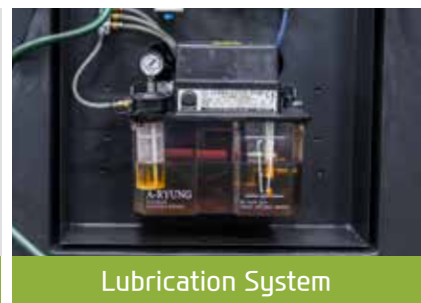
Example of Etc.



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



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.



By applying lubricant only when the machines axis are moving lubrication consumption is reduced by compared to standard systems.

HYUNDAI WIA ENERGY SAVING

HW-ESS (HYUNDAI WIA Energy Saving System)

HYUNDAI WIA Machine tool provides the optimum power saving function that can easily save energy with an intuitive user interface.



1. **Machine-ready power saving function** : Put all servo motors and other motors into sleep mode when no control or operation is done for a set time
2. **Work light auto-off function** : The work light is turned off automatically when no control or operation is done for a set time
3. **Chip conveyor auto power saving** : Operation/non operation time (timer) can be set to save energy
4. **Auto Power-off** : Auto power off after ending the an operation after a period of time
5. **Eco function** : Machine ready sleep mode can be activated/de-activated from the controller panel
6. **Power consumption monitor** : Real time power consumption can be monitored through the OP screen



YouTube HYUNDAI WIA MT

www.youtube.com/HYUNDAIWIAMT

CREATING VALUE IN SEAMLESS MOBILITY

With its top-quality HYUNDAI WIA machine tool creates a new and better world.



<http://machine.hyundai-wia.com>

HYUNDAI WIA Machine Tools
Global Links

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