XF6300

5-Axis Vertical Machining Center

HYUNDAI WIA

THE WORLD'S BEST

When it comes to 5-axis machine tool technology, people tend to consider a product made in Japan, Germany and Switzerland to be the best.
In the past this may have been true, that is up until now.
Introducing the XF6300. The Best 5-axis Vertical Machining Center in the World.

Short CV of Dr. Dennis Korff

Director , Research and Development, EDDC,
HYUNDAI WIA Corporation

Education

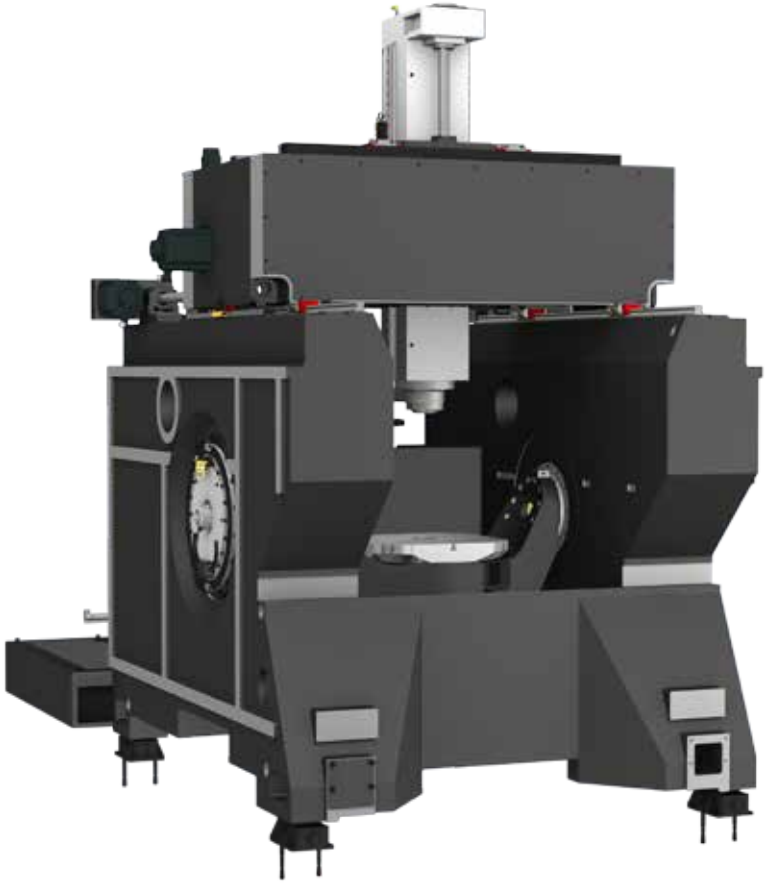
Doctorate, Mechanical Engineering, Machine Tool :
Darmstadt Technical University, Germany

Career

2008~2011	Germany PTW Machine Tool R&D, Engineer
2011~2013	Germany PTW Machine Tool R&D, Chief Engineer
2014~2015	HYUNDAI WIA Europe R&D Center Project Group Leader
Present	HYUNDAI WIA Europe, R&D Center, Project Team Leader

Epilogue

- The main goal of this new development is the enablement of five axis simultaneous machining processes achieving the highest productivity and quality possible
- This target defines all development steps from the beginning of the concept definition in 2014 to the final assembly of the first series machine in 2016
- A team of twelve experienced engineers responsible for mechanical and electrical design, simulation, prototype manufacturing and commissioning as well as test and application focused their activities to achieve the development goals
- The result is the new XF6300, which demonstrates a perfect combination of dynamics, accuracy, quality and productivity which debuted at EMO 2015 and SIMTOS 2016



XF 6300

The XF6300 5-axis vertical machining center in the world-best level, developed by HYUNDAI WIA Europe R&D Center. XF6300 is a perfect blend of machine and technology to realize the ultimate performance in composite machining and mold machining with the highest quality possible resultant of its cutting-edge design features such as the monoblock type bed structure, X/Z axis box-in-box structure, etc.

- Table size (LxH) Ø630 (Ø24.8″)
- Max. load capacity 600 kg (1,323 lb)
- Spindle speed 15,000 rpm [24,000 rpm] [40,000 rpm]
- Spindle power (Max/Cont.)
  31/25 kW (41.6/33.5HP) [26/20 kW (34.9/26.8 HP)] [26/18 kW (34.9/24.1 HP)]
- No. of tools Rack Type : 34 ea [68 ea] [102 ea]
- Travel (X/Y/Z) 650/765/500 mm(25.6″/30.1″/19.7″)
- Rapid traverse rate (X/Y/Z)
  60/60/60 m/min (2,362/2,362/2,362 ipm)
  [HEIDENHAIN TNC640 : 50/50/50] m/min (1,967/1,967/1,967 ipm)]

THE INNOVATION

People ask: "How could machine tool be so innovative?"

The appearance of HYUNDAI WIA's XF6300 may look like an ordinary machine tool. However, XF6300 is designed with a high-tech monoblock type bed structure, box-in box type structure and other advanced features to differentiate it from standard machine tools.

High accuracy and productivity are achieved through its innovative structure.

Applications & Parts

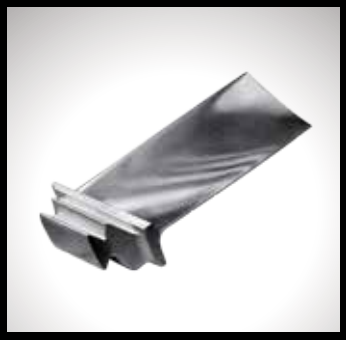
VACUUM PUMP ROTOR

IMPELLER

MOUNTING SHELL

GEAR BOX HOUSING

ELECTRIC MOTOR HOUSING



COMPRESSOR BLADE

HOUSING, ENGINE

TIRE MOLD

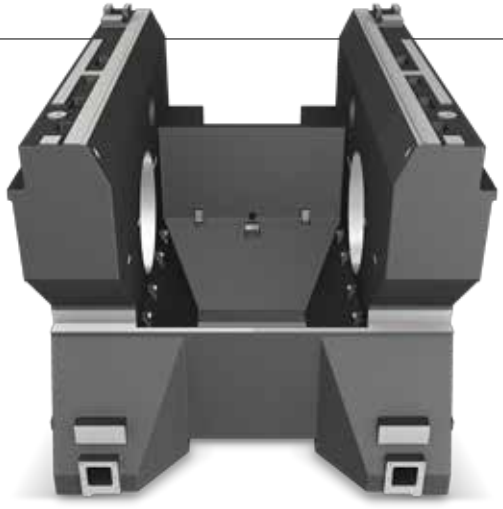
XF6300 Cutting Edge Technology

High Precision & Lightning Fast 5-Axis Vertical Machining Center

60/60/60 m/min Rapid traverse rate (X/Y/Z-axis)	650/765/500 mm Travel (X/Y/Z-axis)
2,362/2,362/2,362 ipm Rapid traverse rate (X/Y/Z-axis)	25.6/30.1/19.7 inch Travel (X/Y/Z-axis)
70/110 r/min Rapid traverse rate (A/C-axis)	150/360 deg Travel (A/C-axis)

❖ HEIDENHAIN TNC640 Rapid traverse rate (X/Y/Z) : 50/50/50 m/min (1,967/1,967/1,967 ipm)

Basic Features

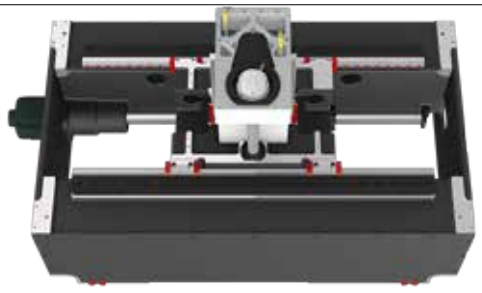


01

Column/Bed All-in-One Structure

XF6300 is designed with an integrated one piece column-bed structure provides superior stability when compared with separate structures.
The All-in-One structure delivers high rigidity and excellent vibration absorption providing exceptional performance and superior surface finishes.

‹Monoblock structure›



02

Box-in-Box Structure (X/Z Axis)

The Box-in-Box design is a symmetrical structure without overhang facilitating unprecedented speed, accuracy, stability, and acceleration. The ram is captured in the saddle of X-axis which surrounds the spindle cartridge providing a thermally stable structure minimizing thermal distortion. The LM guides and drive systems are constant with the center of gravity providing excellent balance of all motion.

03

Built-in Spindle

The built-in type 15,000 rpm spindle (optional 24,000/40,000rpm) dampens vibration transmitted to spindle ensuring tremendous performance in high precision machining such as die mold.

04

DDM Tilting Rotary Table

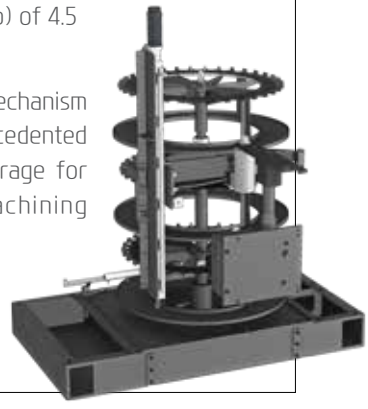
The DDM rotary table is designed to embody highly accurate high speed simultaneous 5-axis motion which allows for the machining of complex prismatic parts with superior accuracy and surface finishes.

05

Multi Step Rack Type ATC

Tool change time (chip-to-chip) of 4.5 seconds is the best in its class.

The rack type tool change mechanism was developed to add unprecedented extra-large capacity tool storage for vastly complex 5 axis machining applications.

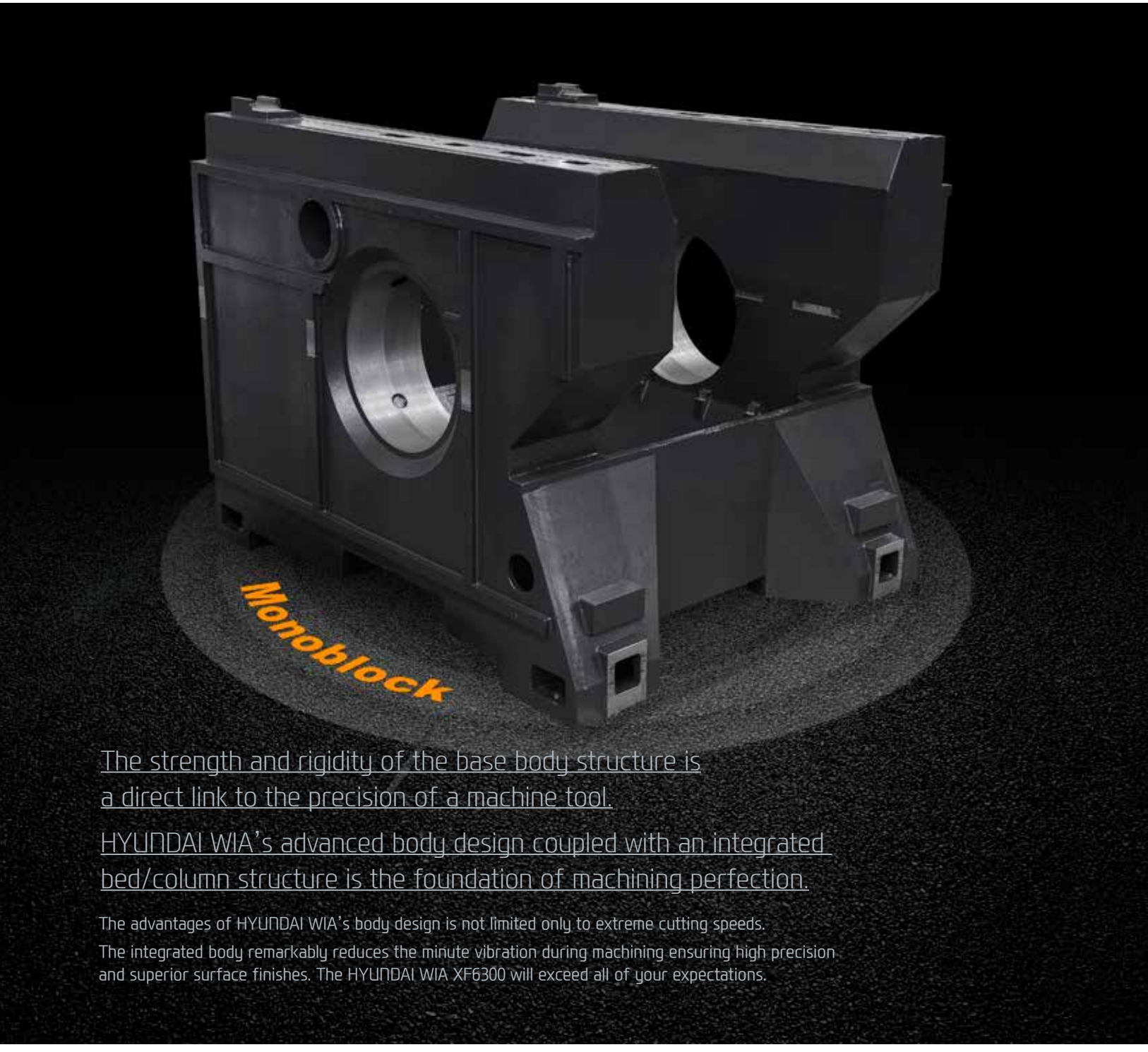


01

XF6300

Body Structure

High-Precision & Lightning Fast 5-Axis Vertical Machining Center

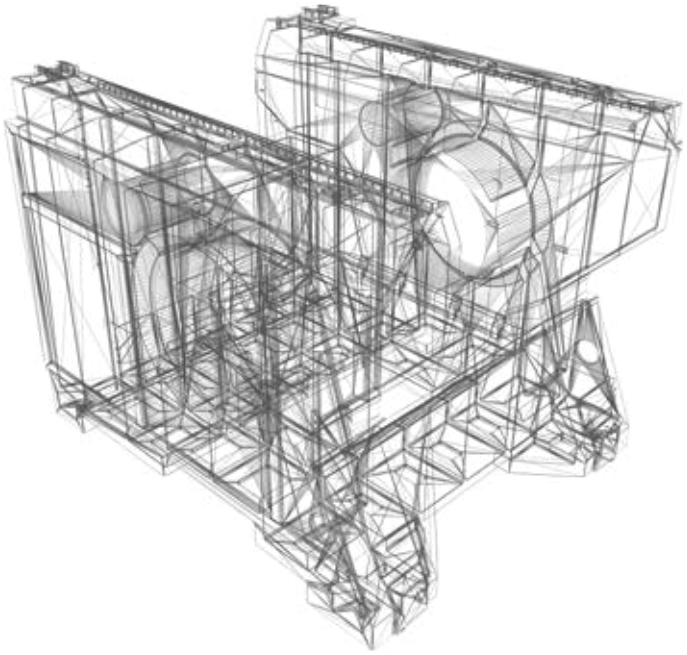


The strength and rigidity of the base body structure is a direct link to the precision of a machine tool.

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

The advantages of HYUNDAI WIA's body design is not limited only to extreme cutting speeds.

The integrated body remarkably reduces the minute vibration during machining ensuring high precision and superior surface finishes. The HYUNDAI WIA XF6300 will exceed all of your expectations.

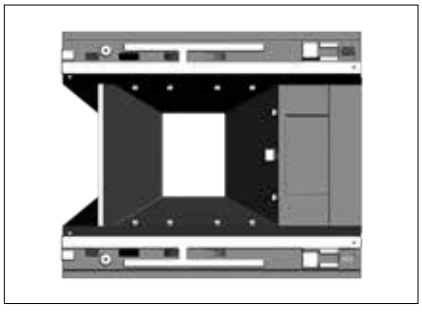


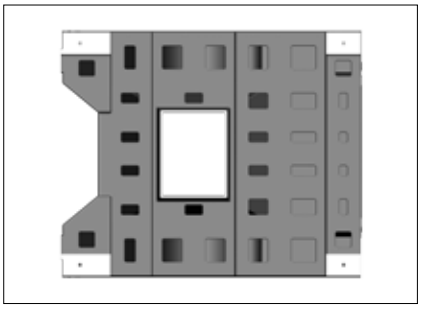
Optimal Structural Analysis (FEM)

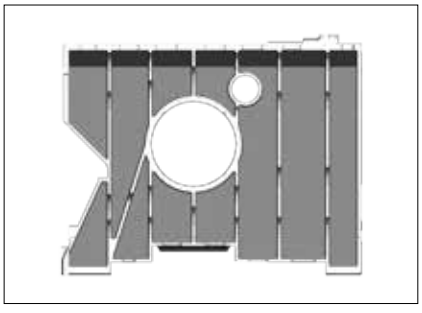
The XF6300 is designed to be the optimum structure through HYUNDAI WIA's exclusive structural analysis.

Column / Bed All-in-One Structure (Rigidity has improved by 130%)

The XF6300 is designed with an integrated one piece column-bed structure providing superior stability when compared with separate structures.
The All-in-One structure delivers high rigidity and excellent vibration absorption providing exceptional performance and superior surface finishes.







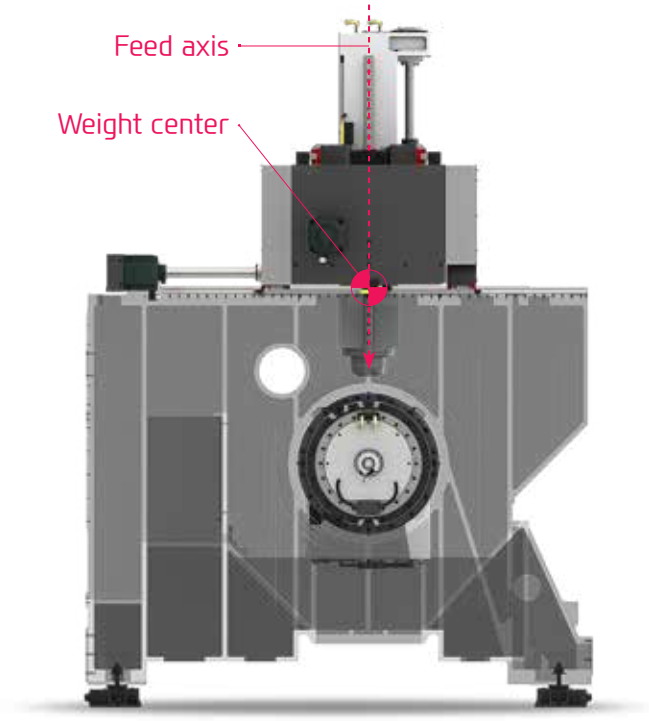
- The monoblock design and integrated bed/column structure provides high rigidity ensuring outstanding dynamic characteristics
- Highly rigid structure without holes on the side wall and a minimal number holes are required on the top and bottom top area
- Casting rib structure optimized for high rigidity
- The integrated rotary table A-axis/column structure ensures high rigidity and superior precision
- The bed structure's agronomical design allows for easy access to the work area

02

XF6300

Slideway Features

High-Precision & Lightning Fast
5-Axis Vertical Machining Center



Symmetric Structure of Z-axis

Vibration and thermal displacement during travel can be minimized by symmetric structure of Z-axis where travel axis is aligned with the weight center of spindle.

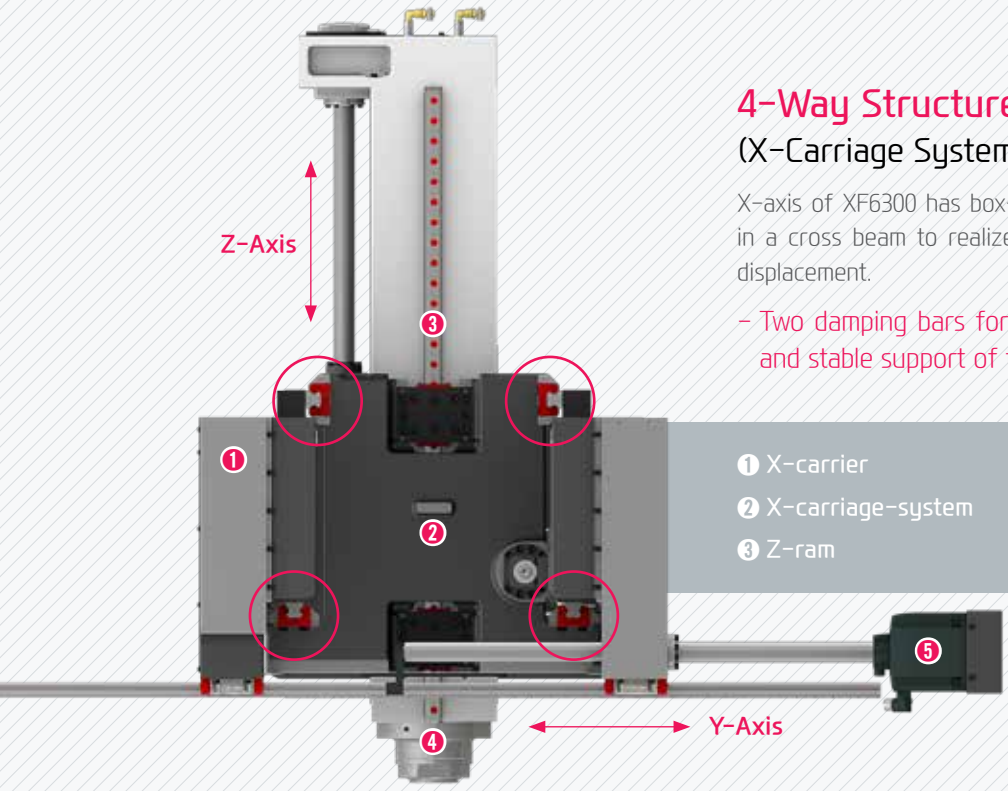
60/60/60 m/min
Rapid traverse rate (X/Y/Z)

650/765/500 mm
Travel (X/Y/Z)

2,362/2,362/2,362 ipm
Rapid traverse rate (X/Y/Z)

25.6/30.1/19.7 inch
Travel (X/Y/Z)

❖ HEIDENHAIN TNC640 Rapid traverse rate (X/Y/Z) :
50/50/50 m/min (**1,967/1,967/1,967** ipm)



4-Way Structure on X Axis
(X-Carriage System)

X-axis of XF6300 has box-type saddle design with 4-way structure in a cross beam to realize improved strength and minimal thermal displacement.

- Two damping bars for the X and Z axis slide providing rigid and stable support of the ram

1. X-carrier
2. X-carriage-system
3. Z-ram
4. Spindle
5. Drive for Y-carriage-system

High-Speed Roller LM Guideway

The XF6300 features **roller type LM guideway** to reduce non-cut time with faster acceleration while providing high rigidity.

⊙ **Feed Axis Acceleration/Deceleration** (X/Y/Z axis) : 1.0G/0.8G/1.0G

❖ HEIDENHAIN TNC640 Feed Axis Acceleration/Deceleration (X/Y/Z axis) : 1.0G/0.7G/1.0G

High-Precision Linear Scale (Standard)

The XF6300 is 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.

03

XF6300

Built-in Spindle

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

Built-in Spindle

The spindle is designed as a built-in structure. This helps reduce vibration and heat and performs with fast acc./dec. rates for high precision machining.

Spindle Cooling

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

HSK-A63 : 15K, 24K | HSK-E40 : 40K

HSK Tool Holder

HSK tool holder is untilized 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.

Through Spindle Coolant {20/30/70 bar (290 psi/435 psi/1,015 psi)} OPTION

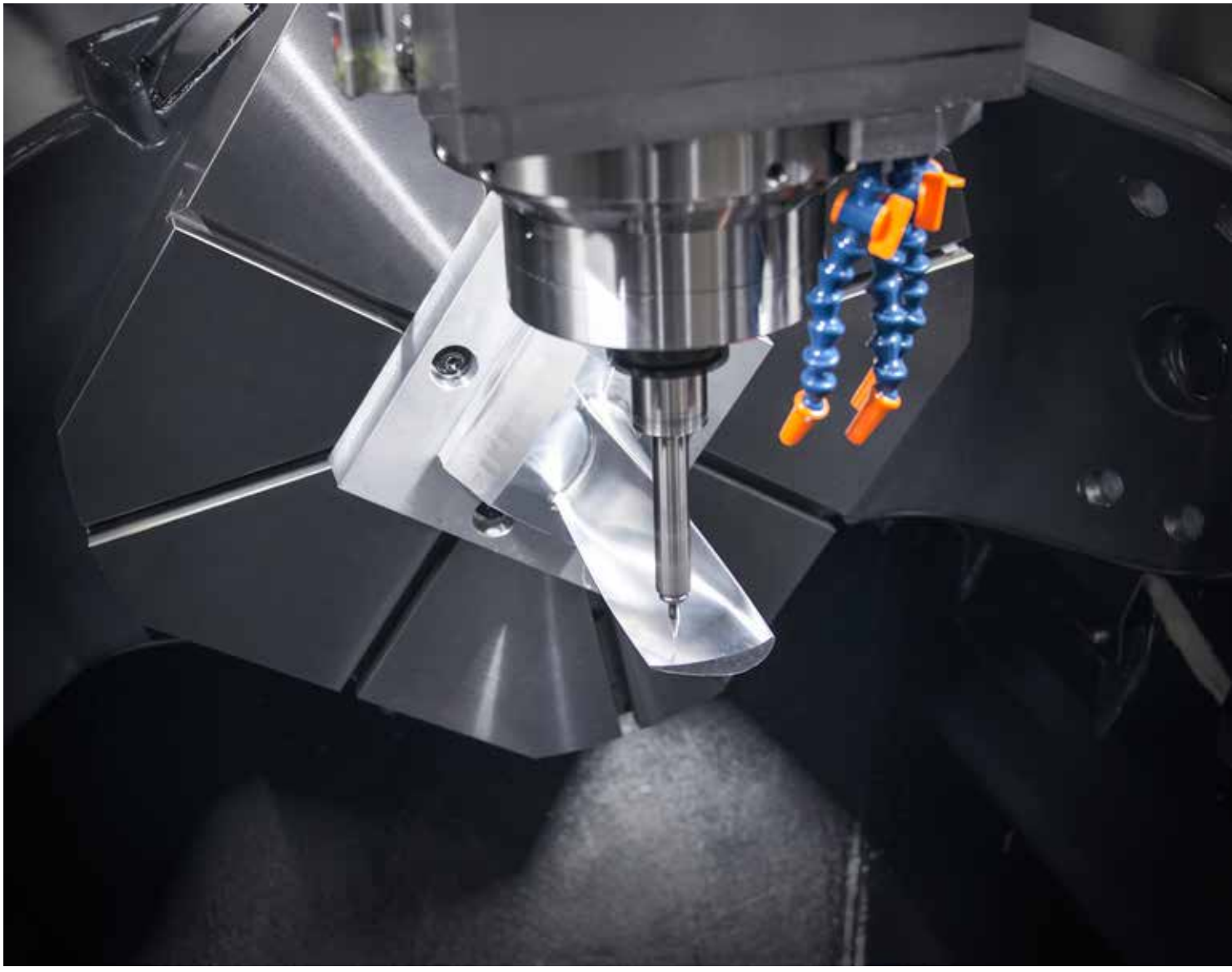
15,000 r/min	24,000 r/min	40,000 r/min
31 kW Output(Max.)	26 kW Output(Max.)	26 kW Output(Max.)
153 N·m Torque (Max.)	85.9 N·m Torque (Max.)	9.9 N·m Torque (Max.)
41.6 HP Output(Max.)	34.9 HP Output(Max.)	34.9 HP Output(Max.)
112.8 lbf·ft Torque (Max.)	63.4 lbf·ft Torque (Max.)	7.3 lbf·ft Torque (Max.)

04

XF6300

Tilting Rotary Table

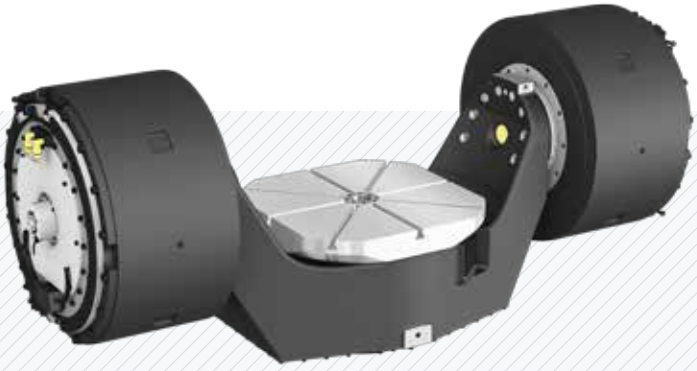
Super Quality & Productivity
5 Axis Vertical Machining Center

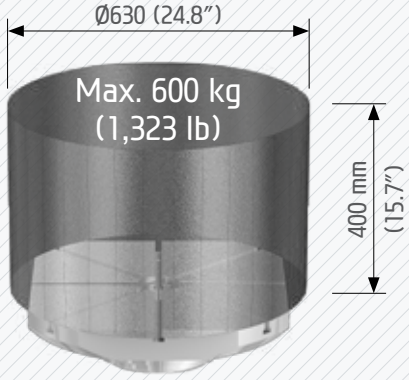


Column-Integrated Table

The A-axis table is designed to be integral to the column. To do so the table is secured using HYUNDAI WIA`s proprietary method of injecting a specially formulated epoxy resin into a gap between column and table.

This assembly technic delivers excellent clamping force and shock absorption are provided from the column.





Ø630 mm
Table size

Max. 600 kg
Max. load capacity

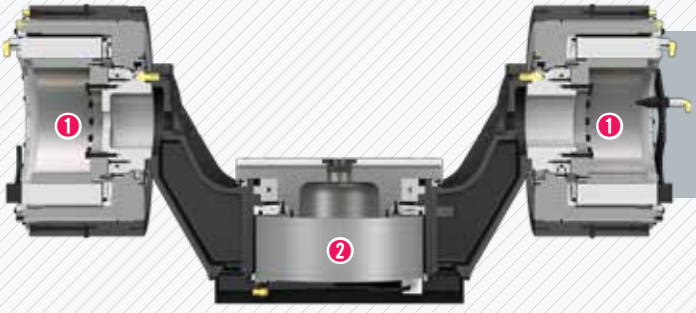
Ø24.8 inch
Table size

Max. 1,323 lb
Max. load capacity

DDM Tilting Rotary Table

The XF6300 has a **tilting rotary table** is designed to embody highly accurate high speed simultaneous 5-axis motion which allows for the machining of complex prismatic parts with superior accuracy and surface finishes.

The direct drive system utilizes **direct drive motor (DDM)** delivering high precision and high speed for improved productivity. The integrated **A-axis housing/column** design ensures high rigidity.



DDM TABLE (Simultaneous 5-Axis)

❶ A-axis built-in motor (tandem type)

❷ C-axis built-in motor

⊙ **A/C indexing angle** : -30~+120˚/360˚

⊙ **A/C indexing speed** : 70/110 rpm

A/C-Axis Rotary Scales Standard

Scale integrated YRTM bearing is assembled directly to the C-axis rotary table providing high precision positioning accuracy and repeatability

⊙ **A-axis** : Rotary Encoder (5 sec. precision)

⊙ **C-axis** : YRTM Bearing (Scale embedded bearing)

05

XF6300

ATC & Magazine

High-Precision & Lightning Fast
5-Axis Vertical Machining Center

ATC & Tool Magazine

Tool change time (chip-to-chip) of 4.5 seconds is the best in its class. The rack type tool change mechanism was developed to add unprecedented extra-large capacity tool for vastly complex 5 axis machining applications.

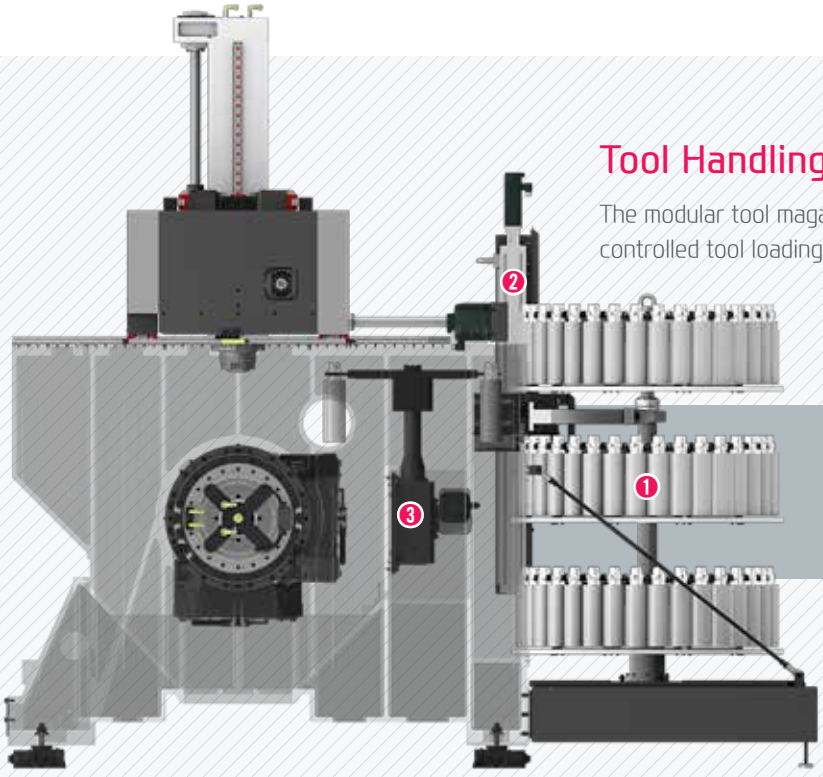
A single step rack magazine of 34 tools is provided standard. 68 and 102 tool capacity are optional.

Rack Type Magazine

34 [68, 102] ea
No. of tools

4.5 sec
Tool change time (C-C)

❖ C-C : 3kg (6.6lb) tool base



Tool Handling System (2-Axis Loading)

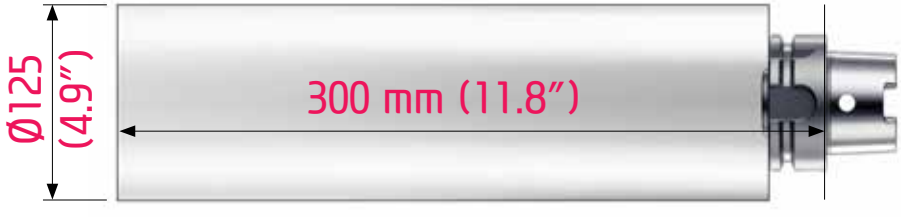
The modular tool magazine of XF6300 is designed as a 2-axis controlled tool loading system for quick tool change.

1. Rack type tool magazine
2. Tool handling system
3. ATC (Twin arm)

Magazine

The tool magazine and machining area are completely separated by a shutter door to prevent coolant and chip contamination out of the tool storage area maintaining high precision and cleanliness. Minimal tool change distance between the tool changer and work area permits for a rapid tool change.

In addition, collision is avoided regardless of A-axis position eliminating the need for homing of A-axis.



HSK-A63 (15K, 24K)
HSK-E40 (40K)

- **Max. Tool Dia.** (W/T Adjacent Tool) : Ø90/Ø125 (Ø3.5″/Ø4.9″)
- **Max. Tool Length** : 300 mm (11.8″)
- **Max. Tool Weight** : 8 kg (17.6 lb) [**40K** : 1.5 kg (3.3 lb)]


SIEMENS

FAST, DYNAMICS, CONVENIENT

· Highest level of acceleration and deceleration (FAST): Acc./Dec. time-1G

· High performance built-in 15, 000 rpm spindle (DYNAMIC) supplying 153 N·m (113 lbf·ft) of torque : Breaking the mold regarding high speed spindle and high torque

· The 19″ monitor allows for easy viewing and accessibility through its ergonomic design (CONVENIENCE)

Those are just some of the values that the XF6300 pursues.

n6 SIEMENS Controller

XF6300

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.

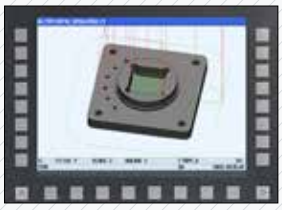
SIEMENS Technology

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
- NC 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)

07 HYUNDAI-iTROL+

XF6300

The Powerful CNC platform for Machine Tools

HYUNDAI-iTROL+ HYUNDAI Intelligent Control

HYUNDAI-iTROL+ & SIEMENS Motor & Drive provide the best solution!

01 19 inch Multi-touch Monitor

02 Convenience enhanced White Grip

03 Quick Function Bar

04 Keyboard/MCP Integrated Panel that enables 30° folding (Keypad LED Lighting)

HYUNDAI-iTROL+ Smart Function

Smart Factory

It is able to check machining list and its status using Regular Maintenance App. Also, you can improve the work by analyzing the problems occurred in the past.

- Check regular inspection and past work history
- Check Work Order/Machining Criteria/Shape of Object/Tool List before machining
- Check machining load, change of transfer speed, status of other equipment during operation

Smart Machining

Tool monitoring (TM), machining speed adaptive control (AFC) features are equipped as default to improve convenience, and machining accuracy is improved by balance measurement of workpiece.

- Equipped with Tool Monitoring (TM) and machining speed adaptive control (AFC) features as default.
- Shifted load compensation feature through balance measurement of workpiece

Smart Diagnosis

Automatic recovery is available through 1 time click of ATC recovery button. It is able to use it to analyze machine's defective status through data collection function for electronic manual and equipment diagnose.

- Reinforced ATC Recovery Function
- Electronic manual is equipped for convenient search and accessibility
- Collect main data for equipment diagnose

Smart Network Service

Smart Network Services, that can monitor the operating status of machining tools in the factory, can perform documentations and CAC /CA M through remote access to user PC.

- Monitor the status of factory operation
- Remote access to other equipment and office PCs

n8 HEIDENHAIN

XF6300

TNC Contouring Control with Drive System

HEIDENHAIN

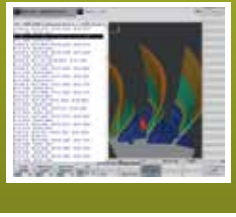
The TNC 640 is compact and easy to read.

The TNC 640 is a versatile contouring control system that can control a 19-inch screen and up to 18 axes.

Its flexible workshop-friendly programming functions, Heidenhain interactive programming and offline programming, allow the user to create the optimal machining environment.

dynamic + precision

Portable Handwhee ››



Perfect 5-Axis Machining

- Powerful motion control shows its strength in 5-axis machining
- ADP (Advanced Dynamic Prediction) for high surface quality and contour accuracy
- Interpolation turning / hobbing of external gears

Detailed Simulation

- PDF files, drawings, etc. can be opened directly on the control
- high resolution, finely detailed 3D simulation function
- 0.5ms block processing time / 21G of storage
- Calculates the geometry ahead of time in order to adjust the feed rate (5,000 blocks).

HW-MCG (Machine Guidance)

NC S/W for various user conveniences such as machine control, maintenance, monitoring and etc.

Common Function

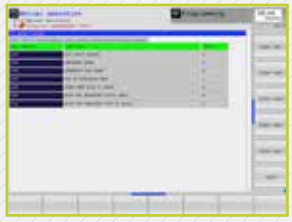
M-code List | Operation Status | Work Count | Working ratio | | I/O Monitor | Cycle Time Monitoring | Working Time | | Machine Option List | Macro Guide |

M-code List
M code search & guide function

Operation Status
Program history managing function

Work Count
Managing work count & lifespan

Working ratio
Power/Running/Machining/ Spindle/Alarm Time



I/O Monitor
Sensor & sol. valve status monitoring

Working Time
Particular program block analysis

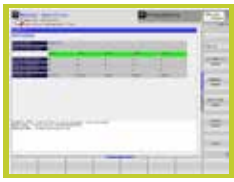
Cycle Time Monitoring
Alarm function according to C/T

Macro Guide
Macro manual for Hyundai WIA S/W

Machine Option List
Machine option list searching & setting

HW-TDC
HYUNDAI WIA Thermal Displacement Compensation

- Thermal displacement compensation designed to minimize machining deviations caused by changes in the external.
- Overcooling control when the main spindle stops.
- Direct compensation by the displacement sensor.
- Same HMI structure as FANUC/SIEMENS for operational convenience.



HW-WARMUP
HYUNDAI WIA Tool Monitoring

- Main spindle stop time check → automatic setting of warm-up time.
- Interlock disables the machining cycle if warm-up is not performed.
- Customer machining program in the warm-up auto mode.
- Automatic warm-up logic when the cycle start begins.
- Same HMI structure as FANUC/SIEMENS for operational convenience.

09

XF6300

Mold Package

Powerful Mold Package, HYUNDAI-WIA Die Mold All in One

HYUNDAI-WIA Mold Package

The XF6300 is equipped with the HW mold package for efficient mold machining.

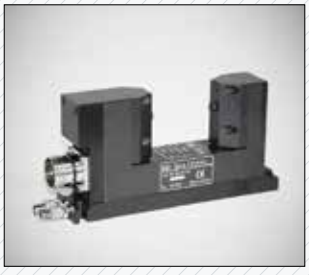
The die mold package includes MDynamics, the most advanced mold software prepared by SIEMENS. Spindle thermal displacement compensation, and automatic tool measuring system ensure high quality mold machining.

SIEMENS 840D sl

1. MDynamics
   (High speed/High accuracy function)
2. Automatic Power Off Device
3. PCU50.5 (Hard Disk Included)

4. Main Spindle Cooling Device (8-channel)
   Spindle temperature monitored with embedded thermal sensors

5. Cutting Air Blow
   Mold machining without coolant



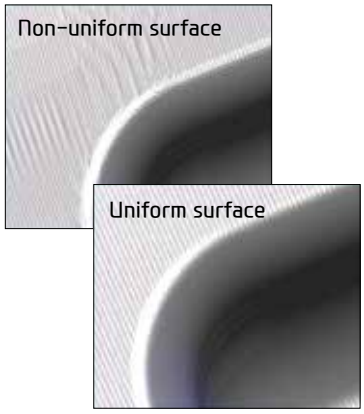
6. Auto Tool Measuring Device
   Renishaw (NC4)
   BLUM (Laser Control Micro Compact)
   Sets tool length and detects wear

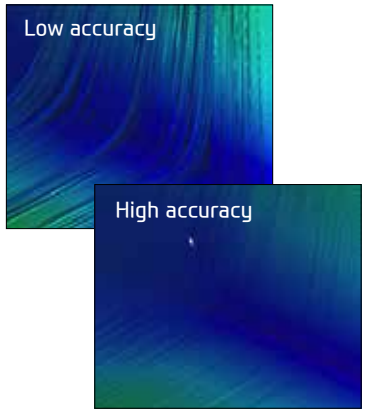
SIEMENS

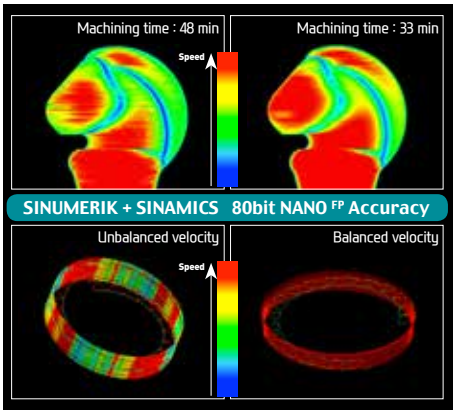
MDynamics 5-Axis Package

- Shop mill
- Remaining material sensing
- Real-time 3D simulation
- Spline interpolation
- 5-axis processing package
- 3D tool radius compensation
- 1,000 block look ahead
- Advanced surface
- Transmitting and circumferential shift
- Measurement cycles
- Compact Flash Card ready
- Coordinate measurement system

Advanced Surface







- Advanced surface software for high speed, high accuracy mold processing
- 80-bit floating-point calculation accuracy is superior to nano-interpolation
- A brand new filter for speed and acceleration control - Minimizes errors generated from 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

10 XF6300

User Convenience

Various Devices for User Friendly

Large 19” Monitor

The XF6300 adopts a 19”monitor for improved visibility of SIEMENS’s main NC functions including shop mill and 3D simulation.

19 inch
Monitor size

120 deg
Indexing angle

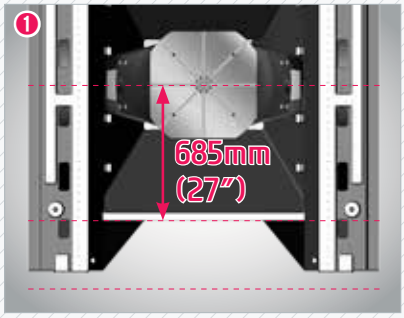
1,450 mm
Height From the screen center

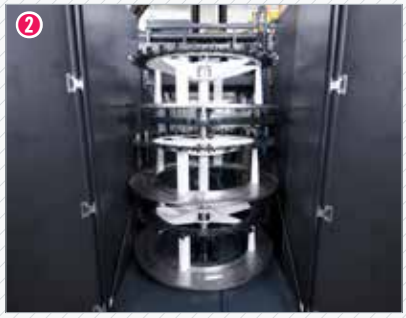
57 inch
Height From the screen center

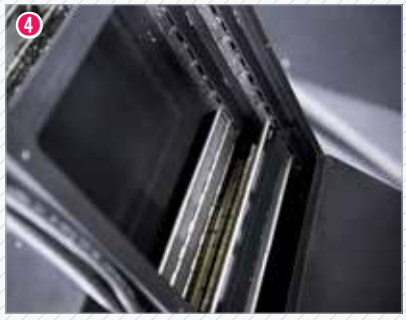
Ergonomic Operation Panel

The XF6300 is designed to be 1,450mm (57”) high for ease of operation while setting up and running a workpiece.

In addition, the PC keyboard ensures user convenience.







❶ Improved Accessibility to Table

The short distance (685 mm [27″]) between the front of bed and the center of table facilitates easy workpiece and fixture setup.

❷ Convenient Tool Change

The magazine cabinet located at the rear of the machine simplifies tool change.

❸ Separate Coolant Tank

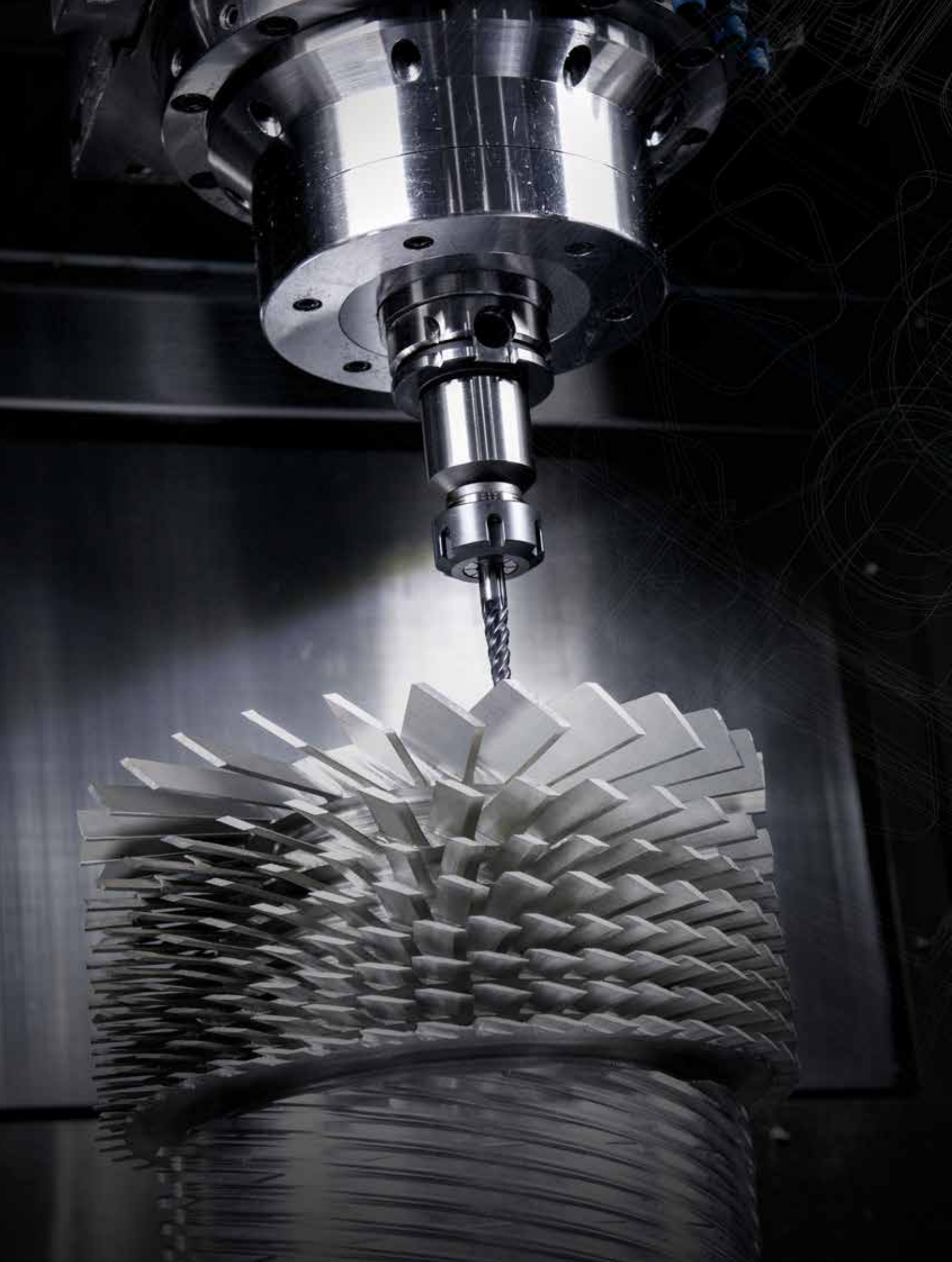
A coolant tank holding up to 1,200 ℓ [317 gal] (optimal capacity: 800 ℓ [211 gal]) is provided.
The coolant tank is a separated from the heat source not allowing heat to be transferred to the machine, resulting in precision improvement.

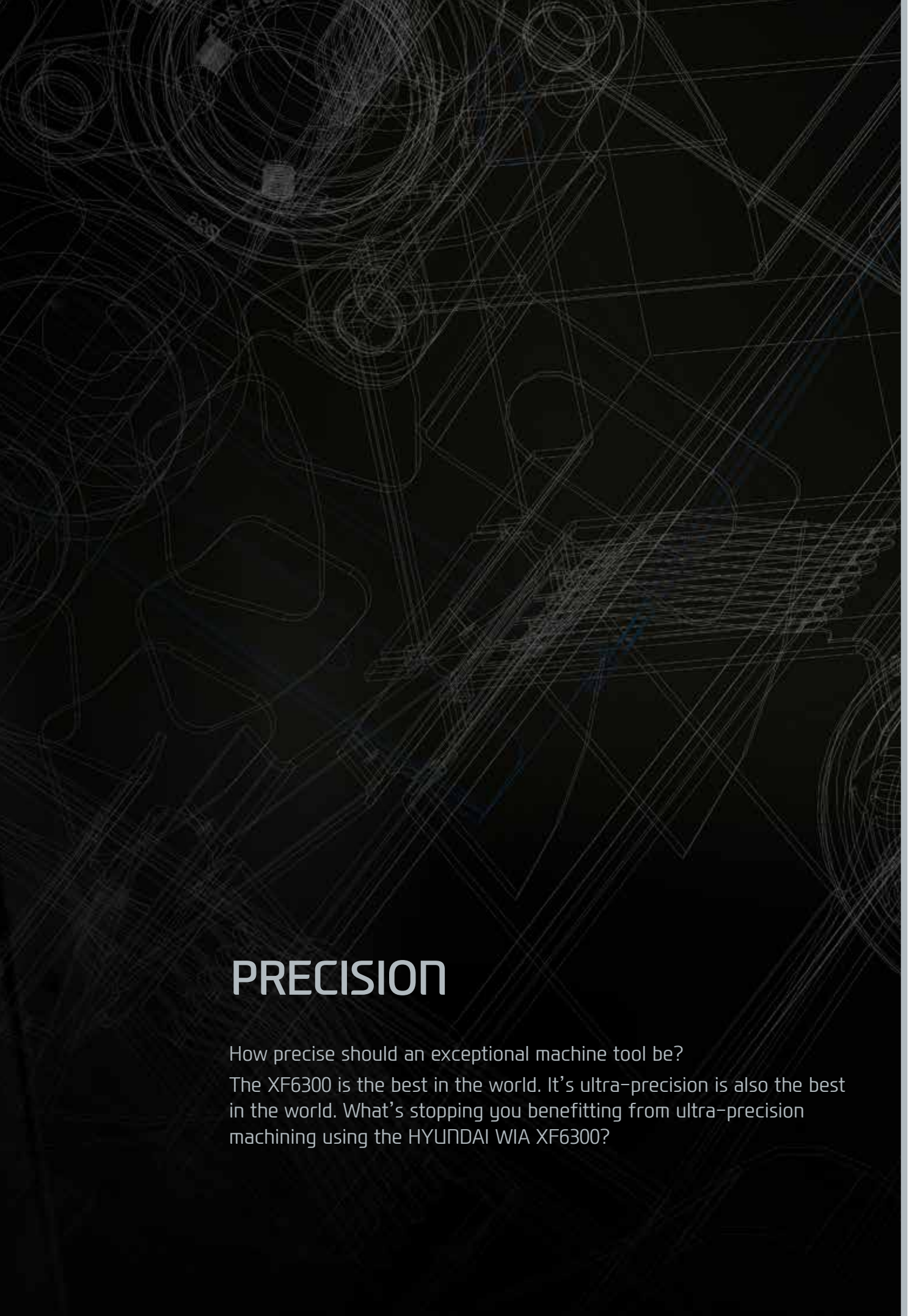
❹ Wedge Wire Chip Conveyor (Integrated Scraper and Hinge Type) OPTION

A combined structure of a scraper type chip conveyor and hinge type rail allows general chips and fine chips to be disposed of at all times.

❺ Auto Pivot Compensation

It can be easily self-calibrate the A-axis and C-axis displacement due to processing conditions and surroundings are always able to maintain a high accuracy.
<Pivot Compensation software (HW-TPC) : Std. Probe & Datumball : Opt.>





PRECISION

How precise should an exceptional machine tool be?

The XF6300 is the best in the world. It's ultra-precision is also the best in the world. What's stopping you benefitting from ultra-precision machining using the HYUNDAI WIA XF6300?

SPECIFICATIONS

Standard & Optional

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

Spindle		
15,000rpm	Bulit-in	●
24,000 / 40,000 rpm	Bulit-in	○
Spindle cooling system		●
ATC		
ATC extension	34	●
	68	○
	102	○
Tool shank type	HSK A63(15/24K)	●
	HSK E40(40K)	●
U-center	D'andrea	☆
Table & Column		
Tap type table		☆
T-slot table		●
DDM NC rotary table (simultaneous 5 axis)		●
Gear NC rotary table((3+2 axis machining suggest)		○
Coolant System		
Std. coolant (flood coolant)		●
Bed flushing coolant		●
Through spindle coolant {25 ℓ (6.6 gal)}	20bar (290 psi)	○
	30bar (435 psi)	○
	70bar (1,015 psi)	○
Shower coolant		☆
Gun coolant		○
Air gun		○
Cutting air blow		●
Tool measuring air blow		●
Air blow for automation		☆
Thru MQL device (without MQL)		☆
Coolant chiller (Sub tank)		☆
Power coolant system (for automation)		☆
Chip Disposal		
Coolant tank	1,200 ℓ (317 gal)	○
Chip conveyor (Hinge/Scraper)	Left	○
	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	○
Electric Device		
Call light	1color : ■	○
Call light	2color : ■ ■	○
Call light	3color : ■ ■ ■	○
Call light & buzzer	3color : ■ ■ ■ B	●
Work light		●
Electric cabinet light		○
Remote MPG		●
3 axis MPG		○
Electric circuit breaker		○
AVR (Auto voltage regulator)		☆
Transformer	65kVA	○
Auto power off		●
ETC		
Tool box		●
Customized color	Need for Munsel No.	☆
CAD & CAM software		☆

Controller		
SIEMENS 840D sl		●
HEIDENHAIN TNC640		○
S/W - SIEMENS		
Machine guidance (HW-MCG)		●
Tool Monitoring (HW-TM)		–
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)		○
Tool Offset Measurement (HW-TOM)		–
Machining Condition Selection (HW-MCS)		●
Adaptive Feed Control (HW-AFC)		–
Conversational Program (HW-DPRO)		○
S/W - HEIDENHAIN		
Advanced function set 1		○
Advanced function set 2		○
HEIDENHAIN DNC		○
DCM collision		○
Python OEM process		○
KinematicOpt		○
S/W - HEIDENHAIN (Customer)		
Display step		○
DXF converter		○
AFC : Adaptive Feed Control		○
KinematicComp		○
CTC : Cross Talk Compensation		○
PAC : Position Adaptive Control		○
LAC : Load Adaptive Control		○
ACC : Active Chatter Control		○
AVD : Active Vibration Damping		○
Measuring Device		
Auto work measuring device		○
Tool monitoring (OMARTIVE/MARPOSS)		○
Auto tool measuring device (Laser)	Renishaw / BLUM	● (Choose one)
Linear scale	X/Y/Z axis	●
Rotary scale	A/C axis	●
Coolant level sensor (only for chip conveyor)		●
Environment		
Control air conditioner (SAMIK/AIR MAJER)		●
ECO energy (hydraulic device/chip conveyor shaving mode)		●
Dehumidifier (SAMIK)		○
Oil mist collector (MORE/YHB/YOUNGPOONG)		☆
MQL (minimal quantity lubrication)		☆
Fixture & Automation		
Auto door		○
Auto shutter (only for automatic system)		○
Sub operation pannel		☆
External M code 4ea		○
Automation interface		☆
I/O extension (In & out)	16 contact	○
	32 contact	○
Hyd. Device		
Std. hyd. unit	70bar (1,015 psi)/ 4 ℓ (1 gal)	●
Center type hyd. supply unit	2×2(4 port)	○
Hyd. unit for fixture	50bar (725 psi)	☆
	Customized	☆

Specifications are subject to change without notice for improvement.

※ Mold Package (HWM AILL IN ONE SIEMENS II) Std. - Mdynamics (S840D)

Spindle Output/Torque Diagram

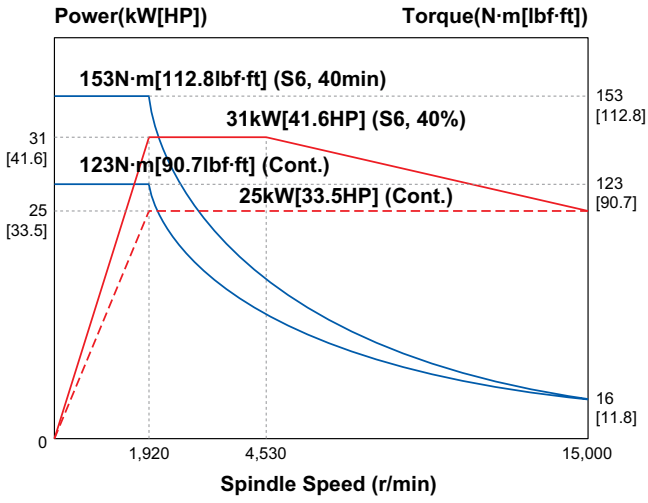
15,000 r/min

31/25 kW Output (Max./Cont.)

153/123 N·m Torque (Max./Cont.)

41.6/33.5 HP Output (Max./Cont.)

112.8/90.7 lbf·ft Torque (Max./Cont.)



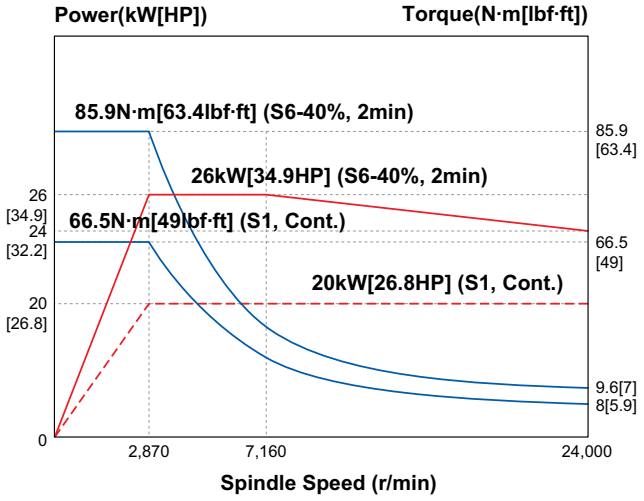
24,000 r/min

26/20 kW Output (Max./Cont.)

85.9/66.5 N·m Torque (Max./Cont.)

34.9/26.8 HP Output (Max./Cont.)

63.4/49 lbf·ft Torque (Max./Cont.)



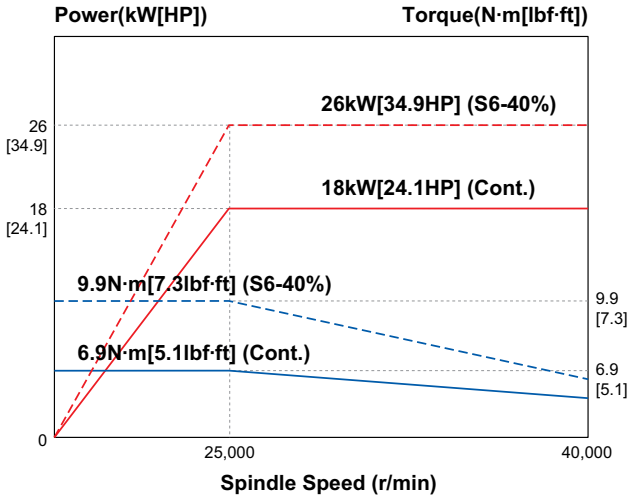
40,000 r/min

26/18 kW Output (Max./Cont.)

9.9/6.9 N·m Torque (Max./Cont.)

34.9/24.1 HP Output (Max./Cont.)

7.3/5.1 lbf·ft Torque (Max./Cont.)

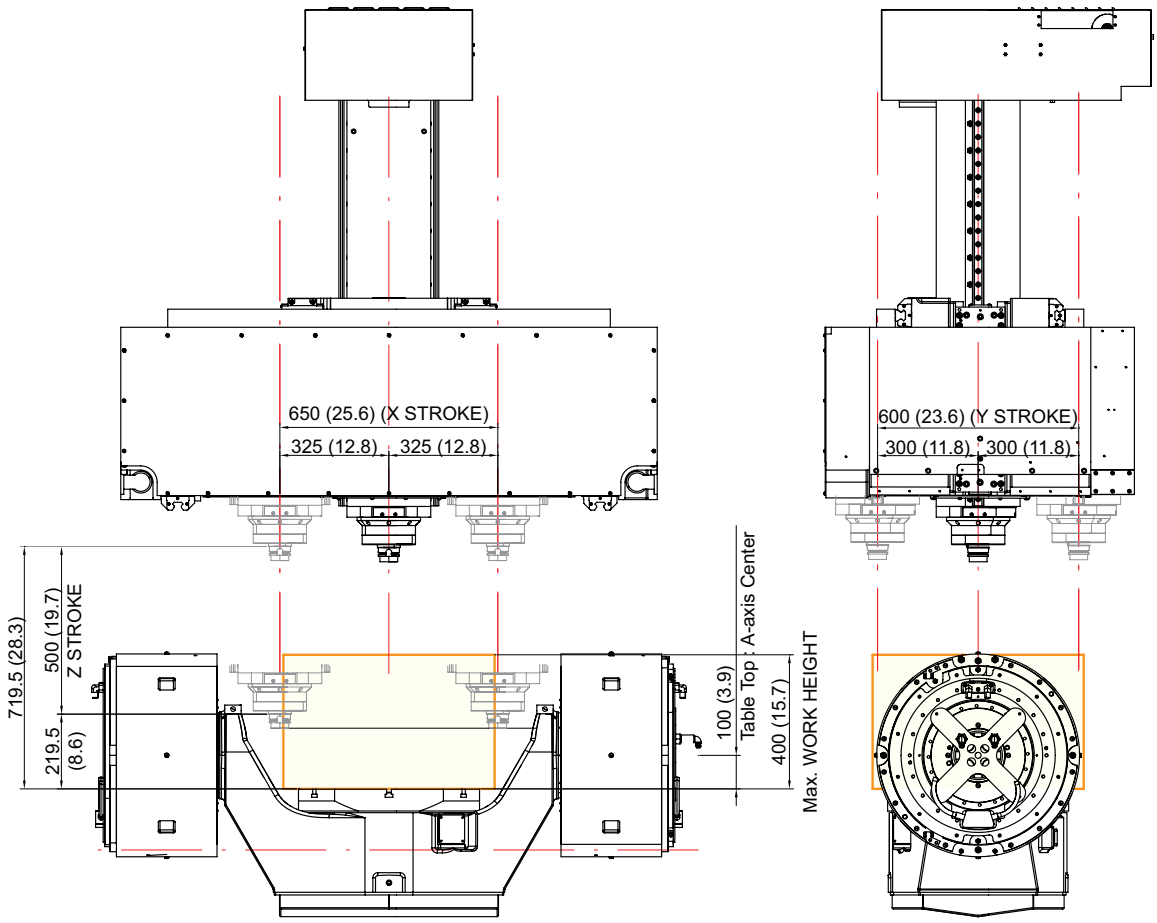


SPECIFICATIONS

Spindle & Table Travel Range

unit : mm (in)

Tilting : A-axis 0°



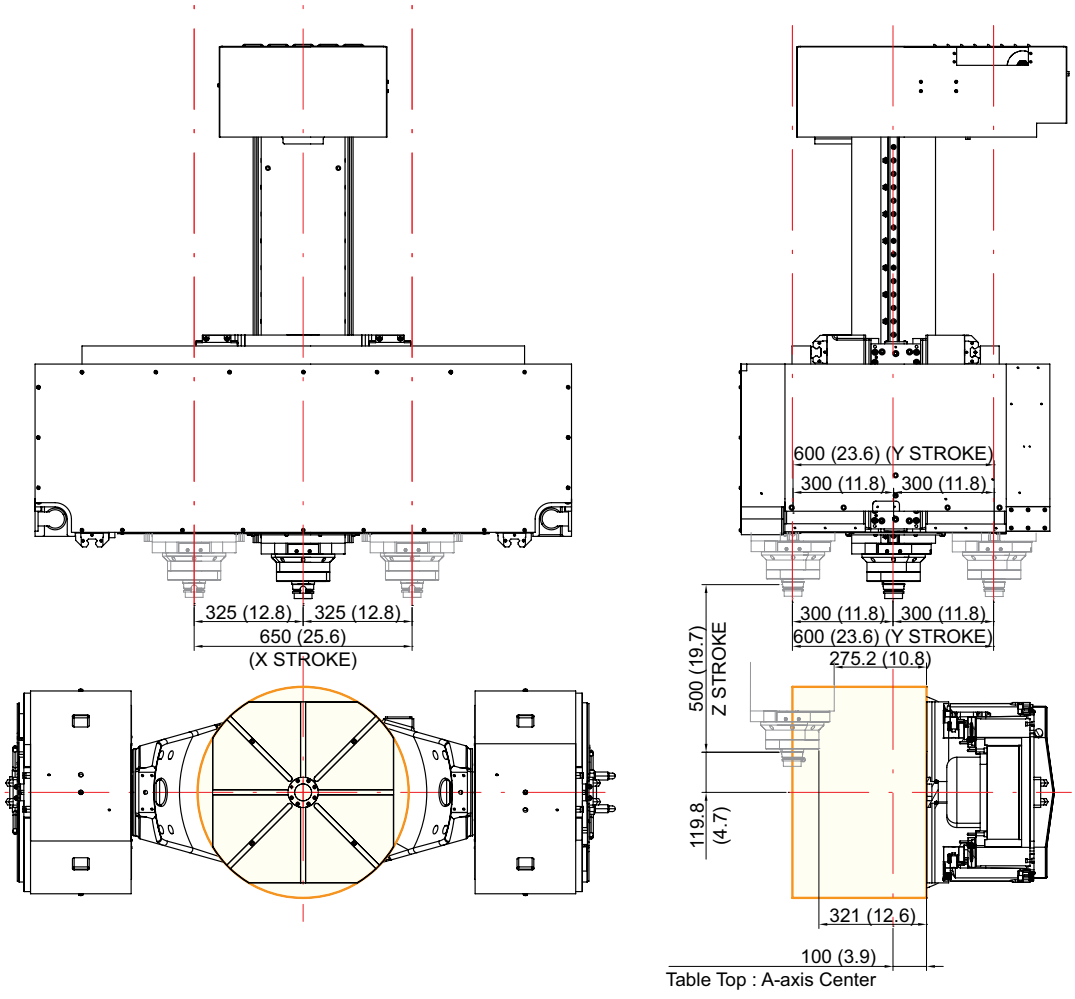
FRONT

LEFT

Spindle & Table Travel Range

unit : mm (in)

Tilting : A-axis +90°



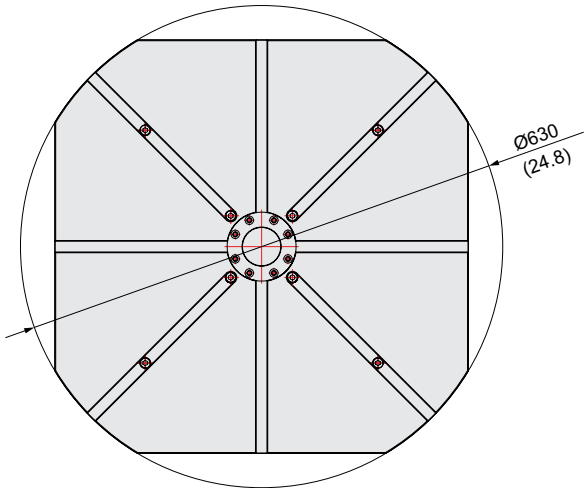
FRONT

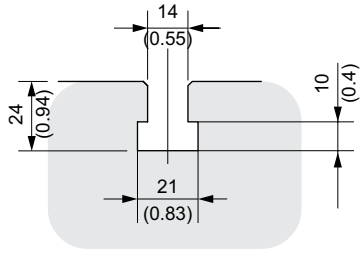
LEFT

SPECIFICATIONS

Table Dimensions

unit : mm (in)



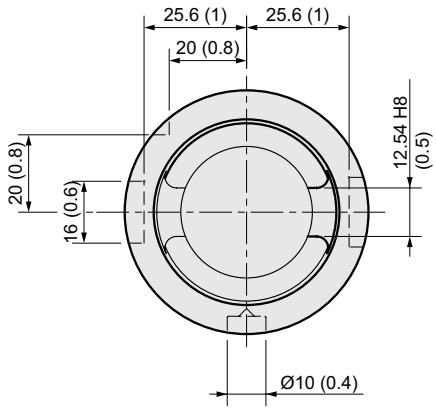


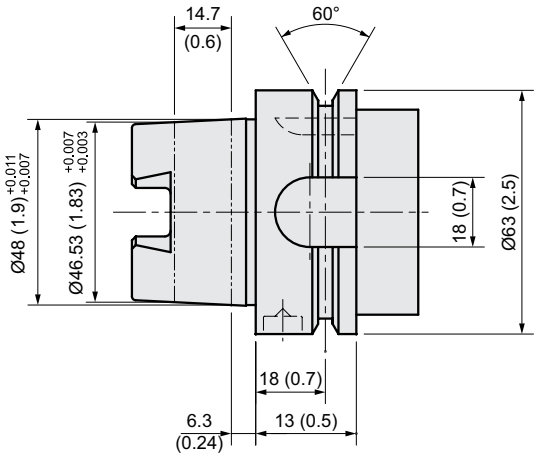
T Slot Detail

Tool Shank

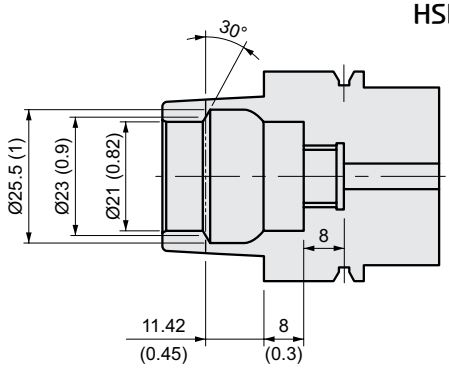
unit : mm (in)

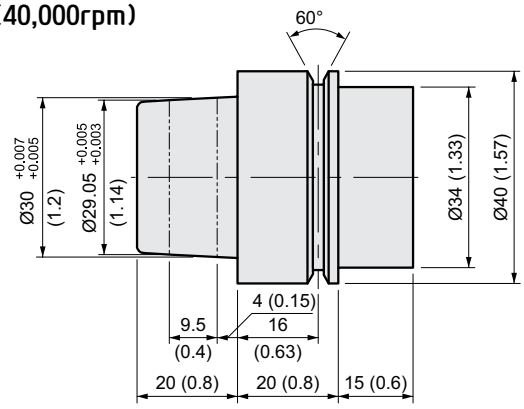
HSK-A63 (15,000rpm / 24,000rpm)





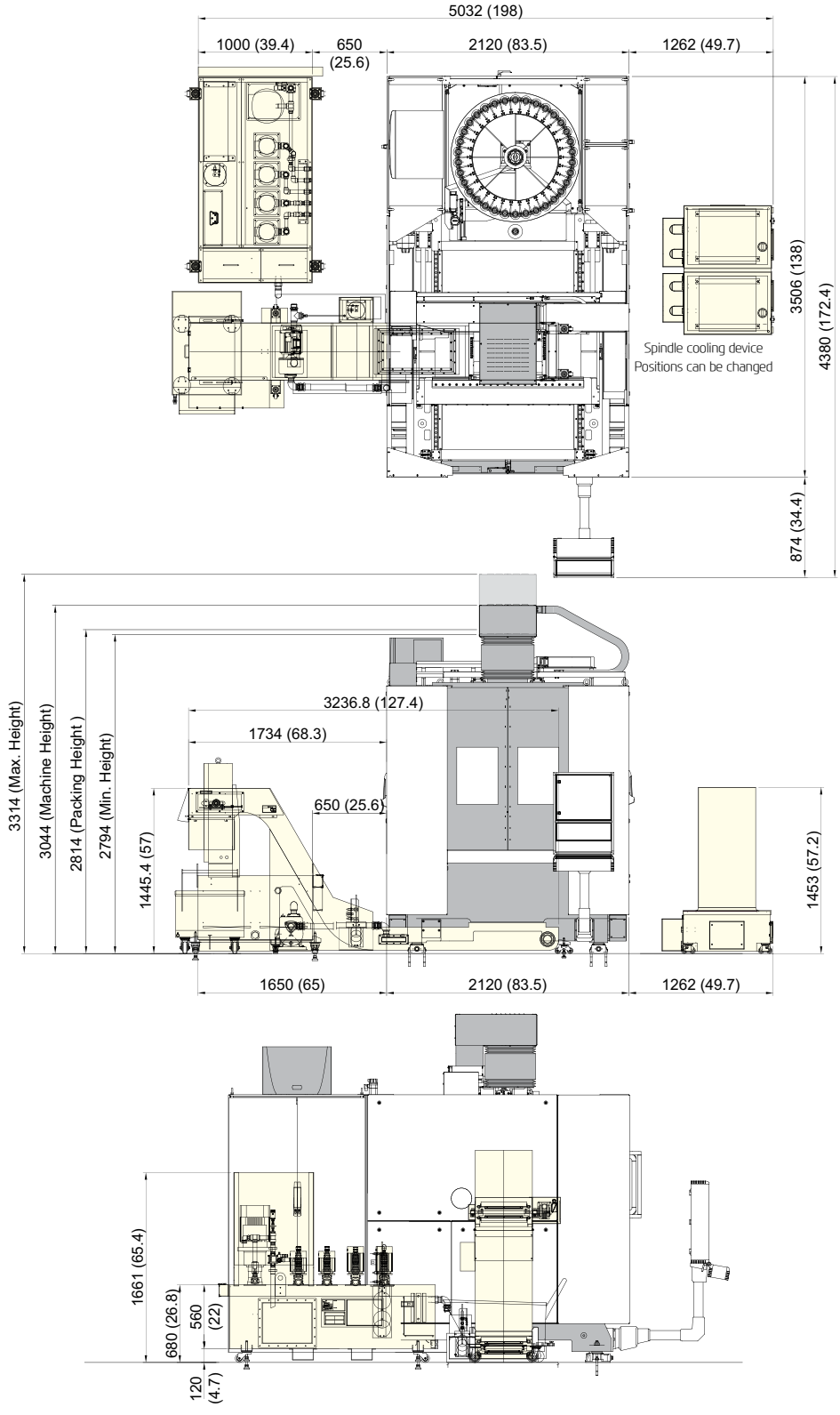
HSK-E40 (40,000rpm)





External Dimensions

unit : mm (in)



SPECIFICATIONS

Specifications

[ ] : Option

MODEL				XF6300
TABLE	Table Size		mm(in)	Ø630 (Ø24.8″)
	Maximum Load Capacity		kg(lb)	Max. 600 (1,323)
	※Max. Macining Height(IxH)		mm(in)	Ø800×500 (Ø31.5″x19.7″)
	Table Driving Method		mm(in)	DDM [GEAR]
SPINDLE	Spindle Taper		-	HSK-A63 [40K : HSK-E40]
	Spindle RPM		r/min	15,000 [24,000] [40,000]
	Spindle Power Output (Max./Cont.)		kW(HP)	31/25 (41.6/33.5) [26/20 (35/27)] [26/18 (35/24)]
	Spindle Torque (Max./Cont.)		N·m(lbf·ft)	153/123 (112.8/91) [85.9/66.5 (63.4/49)] [9.9/6.9 (7.3/5)]
	Spindle Driving Method		-	BUILT-IN
FEED	Travel	X/Y/Z Axis	mm(in)	650/600/500 (25.6″/23.6″/19.7″)
		A/C Axis	deg	150° (-30°~+120°)/360°
	Distance from Table Top to SP. Nose		mm(in)	220 (8.7″) ~ 720 (28.3″)
	Rapid Traverse Rate	X/Y/Z Axis	m/min(ipm)	SIEMENS 840D sl : 60/60/60 (2,362/2,362/2,362) [HEIDENHAIN TNC640 : 50/50/50 (1,967/1,967/1,967)]
		A/C Axis	r/min	DDM : 70/110 [Gear : 25/50]
	Slide Type		-	ROLLER GUIDE
ATC	Number of Tools		ea	34 [68, 102]
	Tool Shank		-	HSK-A63 [40K : HSK-E40]
	Max. Tool Dia. (W/T Adjacent Tool)		mm(in)	Ø90/Ø125 (Ø3.5″/Ø4.9″)
	Max. Tool Length		mm(in)	300 (11.8)
	Max. Tool Weight		kg(lb)	8 (17.6) [40K : 1.5 (3.3)]
	Tool Change Time	C-C	sec	4.5
	Tool Selection Method		-	FIXED / RANDOM
TANK CAPACITY	Coolant Tank		ℓ (gal)	1,200 (317) {Propriety Capacity : 800 (211.3)}
	Lubricating Tank		ℓ (gal)	2 (0.5)
	Hydraulic Tank		ℓ (gal)	4 (1)
POWER SUPPLY	Electric Power Supply		KVA	73
	Thickness of Power Cable		Sq	OVER 50
	Voltage		V/Hz	440/60
MACHINE	Floor Space (L×W)		mm(in)	5,032×4,380 (198″×172.4″)
	Machine Size (L×W)		mm(in)	2,120×4,380 (83.5″×172.4″)
	Height		mm(in)	3,045 (120″)
	Weight		kg(lb)	11,000 (24,251)
CNC	Controller		-	SIEMENS 840D sl [HEIDENHAIN TNC640] [HYUNDAI-iTROL^{+}]

※ If the machining area exceeds Ø630 × 400(Ø24.8″x15.7″), some interference may occur. Please also check the interference area on page 38 of the catalog.

Specifications are subject to change without notice for improvement.

SPECIFICATIONS

HYUNDAI-iTROL+ | SIEMENS 840D sl

Control Function	
Controlled axis	10 axis
Simultaneous controllable axis	5 axis (max 20 axis)
Least Command/input	0.0001mm / 0.0001inch
Feed Function	
Feedrate / Rapid traverse override	0 – 120%
Tool Function	
Tool radius comp.	
Zero offset (G54, G55, G56, G57, G58, G59)	6ea (Max:100ea)
Programmable zero offset	
3D tool radius compensation	
Display	
Language	Chinese simplified, English, French German, Italian, Spanish
CRT/MDI	TFT 19˝ color
Screen saver	
Spindle Function	
Spindle override	50% – 120%
Spindle orientation	
Spindle speed limitation	
Rigid tapping	
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	
Diagnosis Function	
Alarm display / Monitor	
Programming Function	
Part program storage length	10MB
Program name	23 Digits
Subroutine call	7 Level
Absolute/incremental command	G90 – G91

Programming Input & Interpolation Function	
Scaling / Rotation	
Inch / Metric conversion	
Conversational cycle program	22 ea
Block search	
Macro	
Read/Write system variable	
Background editing	
Miscellaneous functions	M – code
Skip	
Program stop	M00, M01, M02, M30
Lookahead, jerk limitation feed & forward control	
Helical interpolation	
COMPCAD, COMPCURB	
Cylinderical interpolation	
Work coordiante interpolation	
Interactive program	
Fanuc program exe.	
Machining package milling	
Protection Function	
Emergency stop	
Soft limit	
Contour monitoring	
Program protection	
Automation Support Function	
Actual speed display	
Tool life management	Time, parts
Work count	Internal
Language	
Two language switchable	Chinese traditional, Czech, Danish Dutch, Finnish, Hungarian, Japanese Korean, Polish, Russian, Swedish Portuguese, Turkish
DATA Transfer	
RS 232C I/F	
Ethernet	

Option	
Display	With harddisk
Data transfer	Only PCU50

HYUNDAI-iTROL+ Native Smart Software

Standard Specification	
Home screen	A launcher function similar to the smart device's home screen
Remote viewer	Remote access to other devices, office PCs, etc., and management of access lists
Manual viewer	PDF manuals for machines, NC, and iTROL+
Calculator	2-points or 3-points center calculation, machining condition calculation
Machine monitoring	Visualized machining status
Job document viewer	Viewer function designed to check work documents such as work instruction and work schedule
Factory monitoring	Real-time monitoring of the machining status of other in-factory machines connected via OPC_UA
Work coordinate setup	An integrated screen designed to execute the workpiece machining coordinate system without switching the screen
Regular check	Inspection list by period, and informs about impending inspections
Energy saving	Energy saving functions (such as Machine Ready power save and work light automatic off), and graphic expression of energy consumption
Machining history	Real-time storage of important machine information (spindle load, tool number, etc.)
Touch MCP	Physical MCP implemented in HMI to resolve the physical limitations
Side screen	All-time display of the frequently used coordinate system, frequently-used expressions, etc. on the left to improve work convenience
ATC recovery	Help screen designed to solve the tool change problems
Tool monitoring & AFC	Real-time monitoring of tool status, and control of machining speed adjustment according to load
Built-in diagnosis history	Provides the machine status history for the machine lifespan through the machine sensor information
Collision avoidance for manual operation mode	Function designed to prevent machine/workpiece collision during the manual operation mode (optional)
HW-DPRO	Automatic creation of part program through an interactive program (optional)

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

SPECIFICATIONS

HEIDENHAIN TNC640 Standard

Axes	
Controlled axes	10 Axes (Max. 18 Axes)
Simultaneously controllable axes	5 Axes.
Rotary Controlled axes	3 Axes (Max. 3 Axes)
Least command increment	0.0001 mm / 0.0001 ° (Option : 0.00001 mm / 0.00001 °)]
Display unit	19-inch color TFT (Option : 15-inch color TFT)]
Program memory	21GB (SSDR solid state disk)
Block processing time	0.5 ms
Path interpolation time	3 ms
Fine interpolation time	0.2 ms
Position controller time	0.2 ms
Speed controller time	0.2 ms
Current controller time	100 us (5000 hz)
Encoder	Absolute EnDat 2.2
Commissioning and diagnostics	
Data interface	Ethernet 2x1000 BASE-T
	4xUSB 3.0
	RS-232-C (max. 115200 baud)
Machine Function	
Look ahead	5,000 Block
HSC filters	
Switching the traverse ranges	
User Function	
Program input	HEIDENHAIN conversational
	DIN/ISO
Position entry	Nominal position for lines and arcs in Cartesian / Polar coordinates
	Incremental / absolute dimensions
	Display / entry in mm or inch
Tool compensation	Tool radius in th working plane and tool length
	Radius-compensated contour for up o 99 blocks (M120)
	3-diemensional tool-radius compensation for changing tool data without having to recalculate an existing program
Tool tables	Multiple tool tables with any number tools
Cutting data	Automatic calculation of spindle speed, cutting speed, feed per tooth / revolution
Constant contour speed	Relative to the path of the tool center
	Relative to the tool's cutting edge
Parallel operation	Creating program with graphical support while another program is being run
3D machining	Motion control with smoothed jerk
	3D tool compensation through surface normal vectors
	Tool Center Point Management (TCPM)
	Keeping the tool normal to the contour
	Tool radius compensation normal to the tool direction
	Manual traverse in the active tool-axis
Rotary table maching	Programming of cylindrical contours as if in two axes
	Feed rate in distance per minute
Contour elements	Straight line
	Chamfer
	Circular path
	Circle center
	Circle radius
	Tangentially connecting circular arc
	Corner rounding
FK free contour programming	in HEIDENHAIN conversational format with graphic support for workpiece drawings not dimensioned for NC
Program jumps	Subprograms
	Program section repeats
	Calling any program as a subprogram
Coordinate transformation	Datum shift, rotation, mirror image, scaling factor (axis-specific)
Q parameters programming with variables	Mathematical functions
	Logical operations
Q parameters programming with variables	Calculating with parentheses
	Absolute value of a number, constant π, negation, truncation of digits
	Functions for calculation of circles
	Functions for text processing

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

HEIDENHAIN TNC640 Standard

User Function	
Fixed cycle	Drilling, tapping, rigid tapping
	Peak drilling, reaming, boring, centering
	Milling internal and external threads
	Clearing level and oblique surfaces
	Multioperation machining of straight and circular slots
	Multioperation machining of rectangular and circular pockets
	Cartesian and polar point patterns
	Contour train, contour pocket
	Contour slot with trochoidal milling
	Engraving cycle
Programming aids	Calculator
	Complete list of all current error messages
	Context-sensitive help function for error
	TNCguide : The integrated help system
	Graphic support for programming cycles
CAD viewer	Display of CAD data formats on th TNC
Teach-In	Actual positions can be transferred directly into the NC program
Test grphics Display modes	Graphic simulation
	Plan view /projection in 3planes /3D view
	Magnification of details
3D line graphics	For verification of programs created offline
2D pencil-trace graphics	2D pencil-trace graphics
Program-run graphics display moded	Graphic simulation during real-time maching
	Plan view /projection in 3planes /3D view
Machining time	Calculation of machining time in the Test Run operating mode
Machining time	Display of the current maching time in the Program Run operating modes
Returning to the contour	
Datum management	One table for storing reference point
Datum tables	Multiple datum tables for storing workpiece-specific datums
Language	English / German / Korean / French / Italian / Spanish / Portuguese / Swedish / Danish / Finnish / Dutch /
	Polish / Hungarian / Russian / Chinese / Chinese_Trad /Slovenian / Norwegian / Czech / Romanian / Slovak / Turkish
Interpolation	
Linear	5 Axes
Circular	3 Axes
Spline	(Max. 5 Axes)
Helical	
Cylinder surface	
Rigid tapping	

HEIDENHAIN S/W OPTION (As a standard)	
Option #8	Advanced function set 1
Option #9	Advanced function set 2
Option #18	HEIDENHAIN DNC
Option #40	DCM collision
Option #46	Python OEM process
Option #48	Kinematic Opt

HEIDENHAIN S/W OPTION (Customer Option)	
Option #23	Display step
Option #42	DXF converter
Option #45	AFC : Adaptive Feed Control
Option #52	Kinematic Comp
Option #141	CTC : Cross Talk Compensation
Option #142	PAC : Position Adaptive Control
Option #143	LAC : Load Adaptive Control
Option #145	ACC : Active Chatter Control
Option #146	AVD : Active Vibration Damping

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