# XF Series

**XF6300 | XF8500**

HYUNDAI WIA 5-Axis Vertical Machining Center

HYUNDAI
WIA
EXPERIENCE
THE NEW TECHNOLOGY

# THE WORLD 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 XF series. The Best 5-axis Vertical Machining Center in the World.



## TECH CUBE, HYUNDAI WIA Europe Technical Center

In our determination to develop machine tools that deliver unrivalled satisfaction to our customers, and our unwavering commitment to grow into the world's best machine tool company, HYUNDAI WIA have established a technical support center in Germany.

Through its new European Technical Center, HYUNDAI WIA will not only enhance technical support for its European clients but also run a variety of marketing campaigns on the continent with the aim of growing into the leading machine tool brand in the entire European market.

Notably, the company will staff the R&D Center with world-class researchers who will take the lead in promoting the technological enhancement by developing new machine tools that far surpass the performance of existing machine tools in Europe.

**HYUNDAI WIA is now set to become a global player.**

# Cutting Edge Technology

The XF series 5-axis vertical machining center in the world-best level, developed by HYUNDAI WIA Europe R&D Center.
XF series are 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.

## XF SERIES

| ITEM | | XF6300 | XF8500 |
|---|---|---|---|
| Table size | mm(in) | Ø630 (Ø24.8") | Ø850 (Ø33.5") |
| Max. load capacity | kg (lb) | 600 (1,323) | 1,000 (2,205) |
| Spindle speed | rpm | 15,000 [24,000/40,000] | 15,000 [9,000/24,000/30,000] |
| Spindle power (Max/Cont.) | kW (HP) | 31/25 (41.6/33.5) [26/20 (35/27)] [26/18 (35/24)] | 31/25 (41.6/33.5) [42/31 (56.3/41.6)] [26/20 (35/27)] [120/80 (160.9/107.3)] |
| No. of tools | ea | 34 [68, 102] | |
| Travel (X/Y/Z) | mm(in) | 650/600/500 (25.6"/23.6"/19.7") | 850/920/600 (33.5"/36.2"/23.6") |
| Rapid traverse rate (X/Y/Z) | m/min (ipm) | 60/60/60 (2,362/2,362/2,362) | 45/45/45 (1,772/1,772/1,772) |



XF6300

XF8500

# THE INNOVATION

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

The appearance of HYUNDAI WIA's XF series may look like an ordinary machine tool.
However, XF series ares 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.
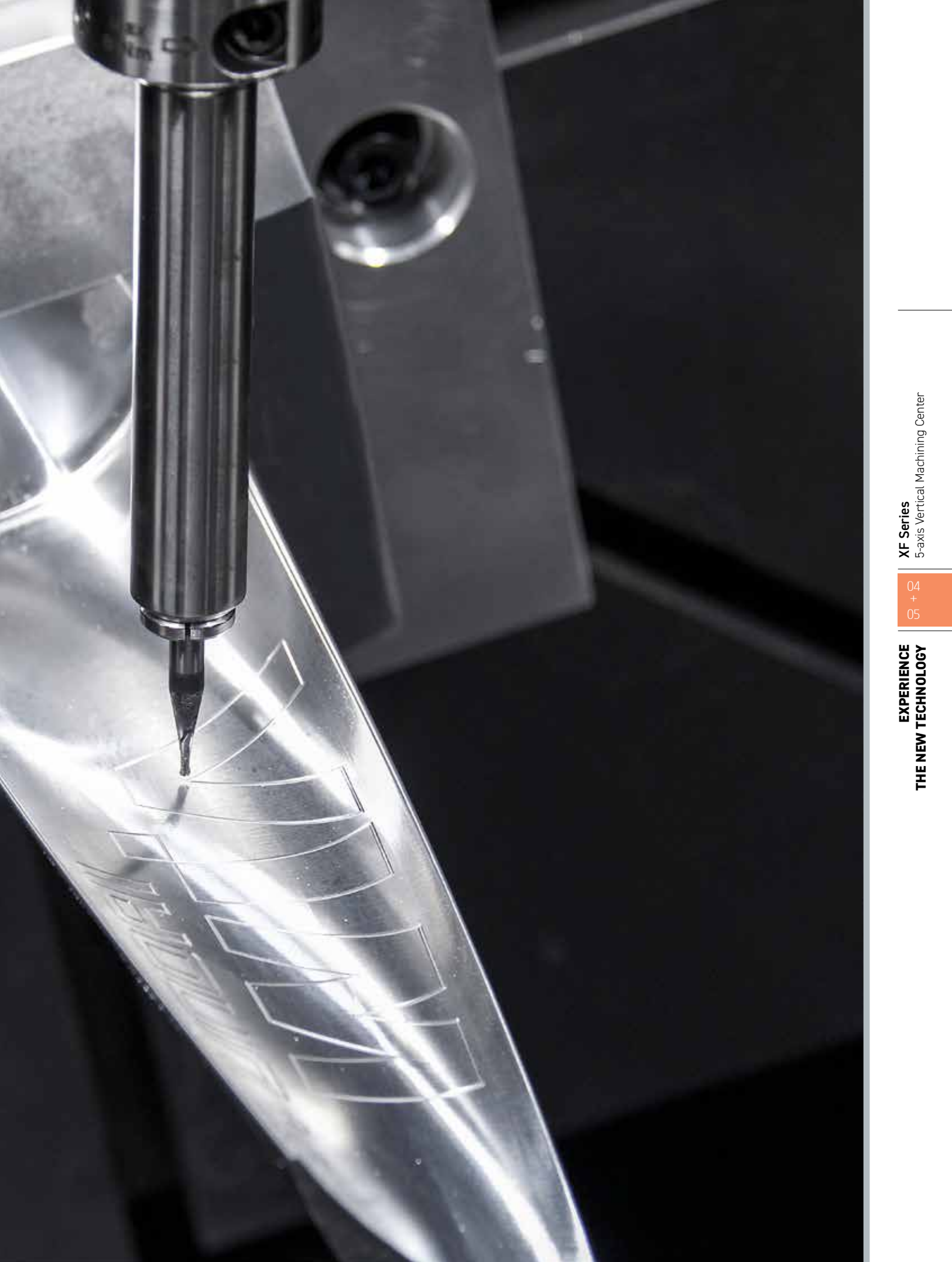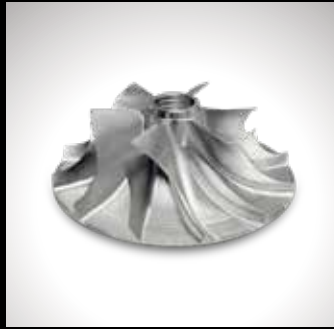
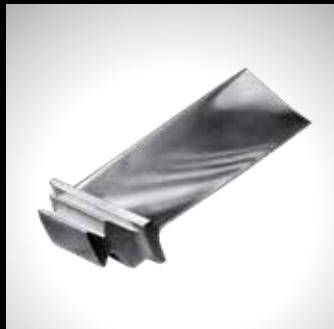# Applications & Parts

VACUUM PUMP
ROTOR

IMPELLER

MOUNTING
SHELL

HOUSING,
GEAR BOX

HOUSING,
ELECTRIC MOTOR

BLADE,
COMPRESSOR

HOUSING,
ENGINE
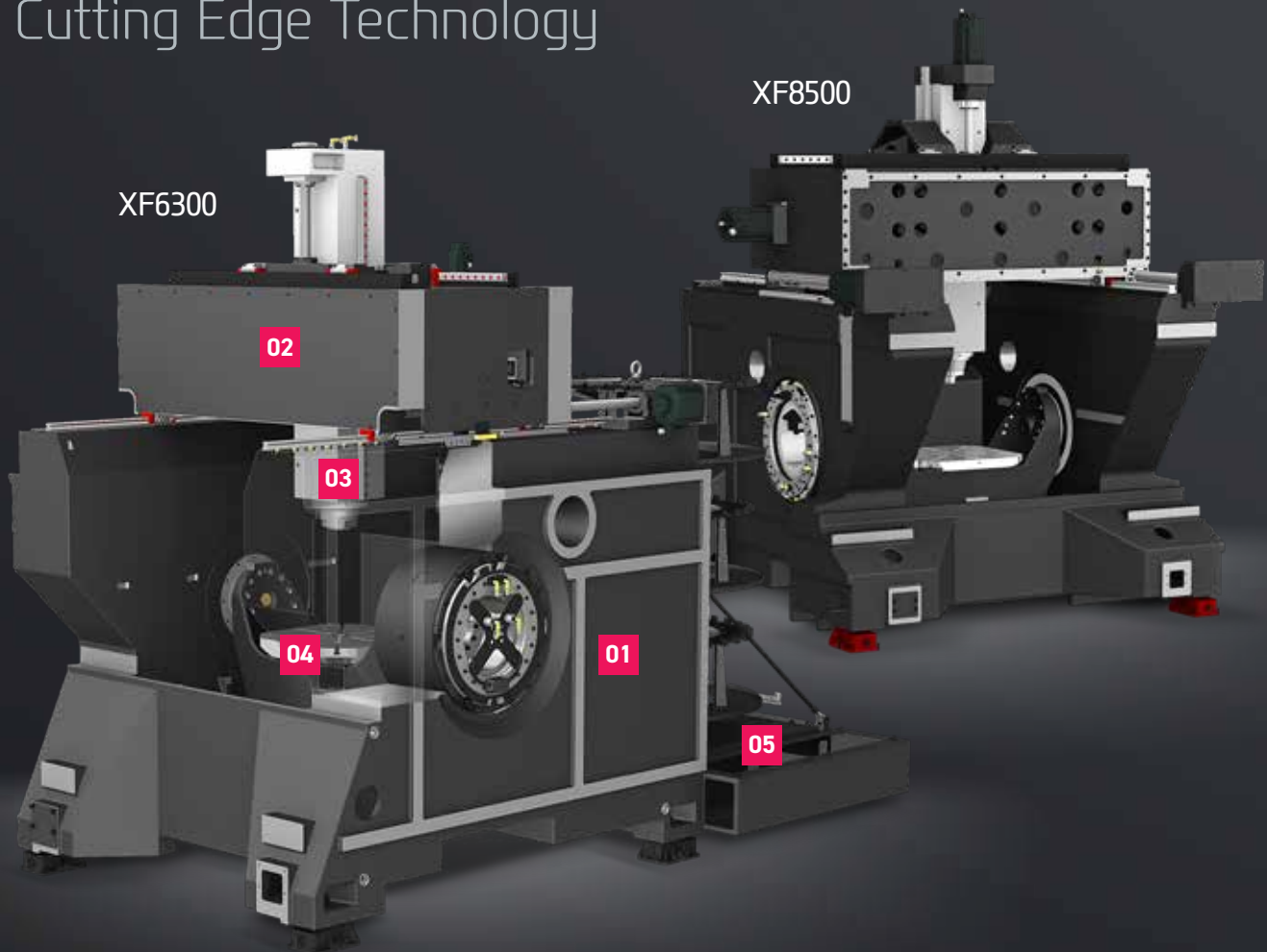
TIRE MOLD

# XF SERIES

## Cutting Edge Technology

XF8500

XF6300

**02**

**03**

**04**

**01**

**05**

## XF6300

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

**60/60/60** m/min (2,362/2,362/2,362 ipm)
Rapid traverse rate (X/Y/Z-axis)

**70/110** r/min
Rapid traverse rate (A/C-axis)

**650/600/500** mm (25.6"/23.6"/19.7")
Travel (X/Y/Z-axis)

**150/360** deg
Travel (A/C-axis)

## XF8500

**45/45/45** m/min (1,772/1,772/1,772 ipm)
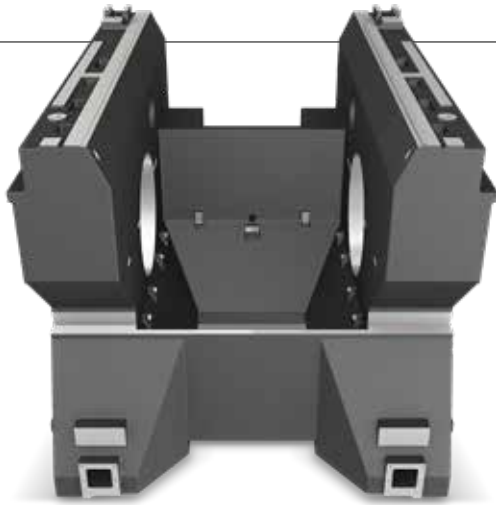Rapid traverse rate (X/Y/Z-axis)

**50/100** r/min
Rapid traverse rate (A/C-axis)

**850/920/600** mm (33.4"/36.2"/23.6")
Travel (X/Y/Z-axis)

**150/360** deg
Travel (A/C-axis)

# Basic Features

**01**

## Column/Bed All-in-One Structure

XF series are 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 pusher(head body) in the saddle of X-axis, which surrounds the spindle cartridge, is desinged with box-in-box type. This thermal equilibrium structure helps minimize thermal deformation.

**03**

## Built-In Spindle

The built-in spindle minimizes spindle vibration, enabling outstanding performance in a high-precision cutting environment such as mold products.

**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**

## Rack Type Magazine

A single step Rack type magazine of 34 tools is provided as a standard.
2 step 68 tools and 3 step 102 tools featured as an option.

XF630 :
Rack Type ATC

XF8500 :
Pickup Type ATC [Twin Arm]

# 01

# Body Structure

High-Precision & Speed 5-Axis Vertical Machining Center

_Monoblock_

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 XF series will exceed all of your expectations.
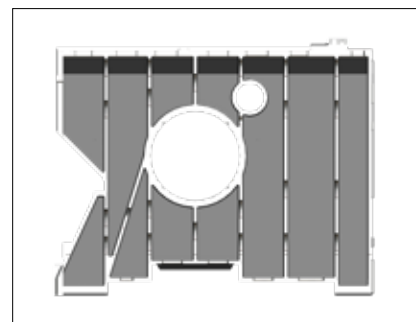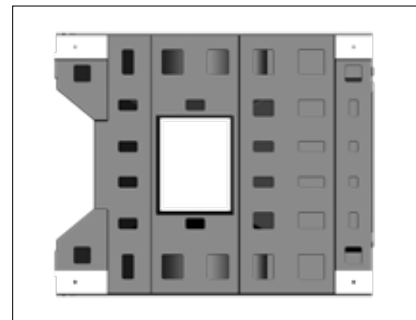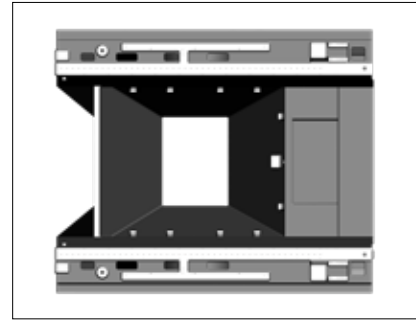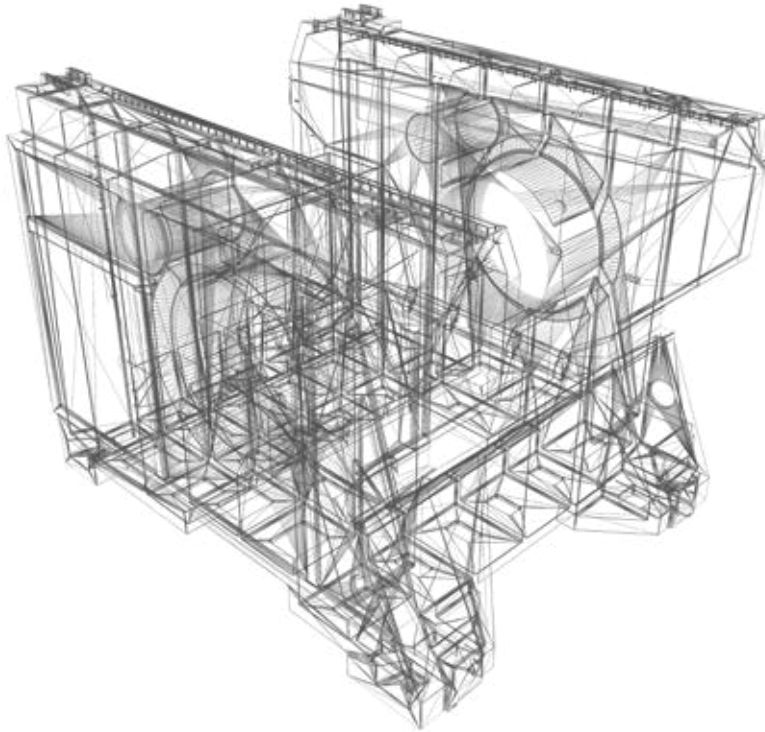
## Optimal Structural Analysis (FEM)

The XF series are 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 XF series are 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

# Slideway Features

High-Precision & Speed  5-Axis Vertical Machining Center

## BOX IN BOX

The pusher(head body) in the saddle of X-axis, which surrounds the spindle cartridge, is desinged with box-in-box type. This thermal  equilibrium structure helps minimize thermal deformation.

Feed axis
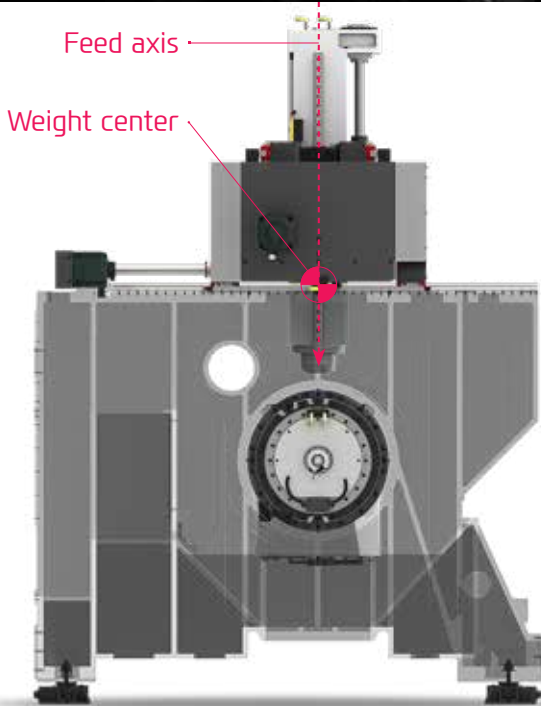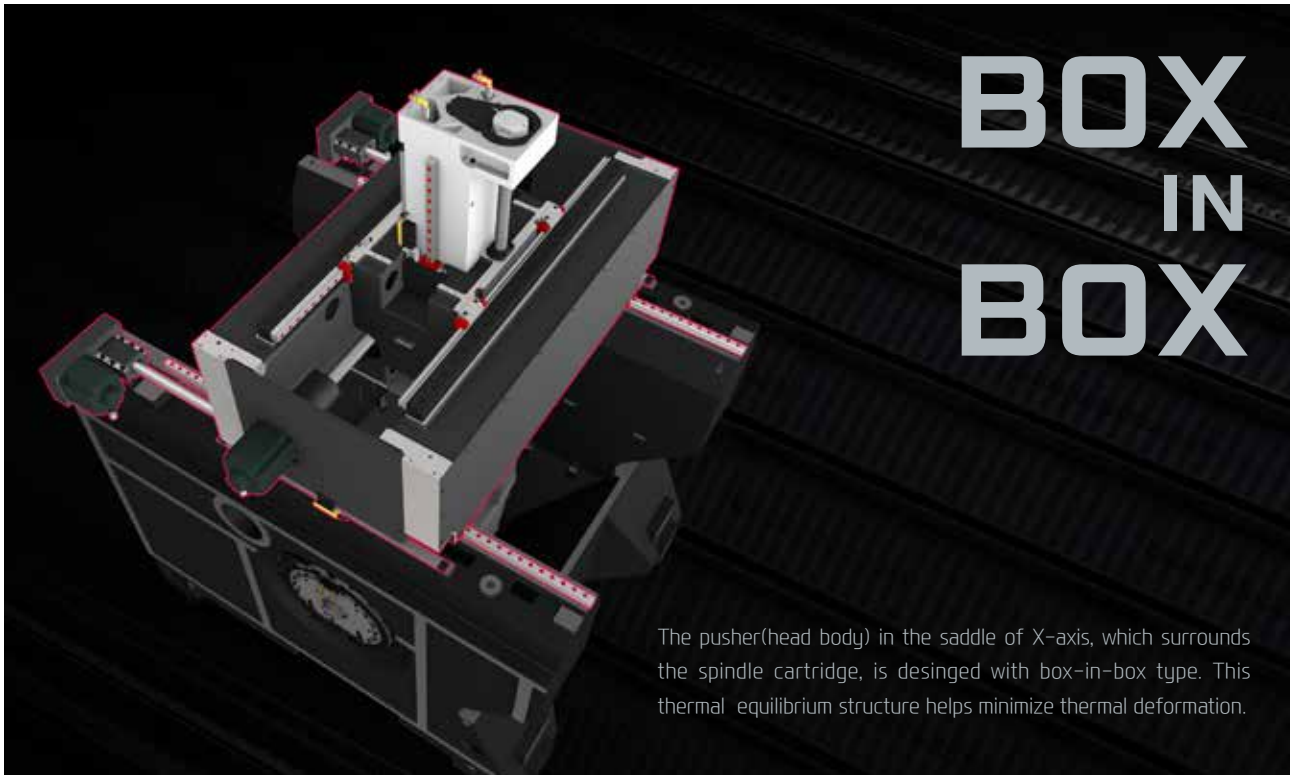
Weight center

## 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.

## Y-axis Double Ballscrew Structure

The Y-axis is driven by two ball screws and feed motors to provide unprecedented speed, accuracy, stability, and acceleration than general purpose machines.

### XF6300

650/600/500 mm (25.6"/23.6"/19.7")
Travel (X/Y/Z)

### XF8500

850/920/600 mm (33.4"/36.2"/23.6")
Travel (X/Y/Z)
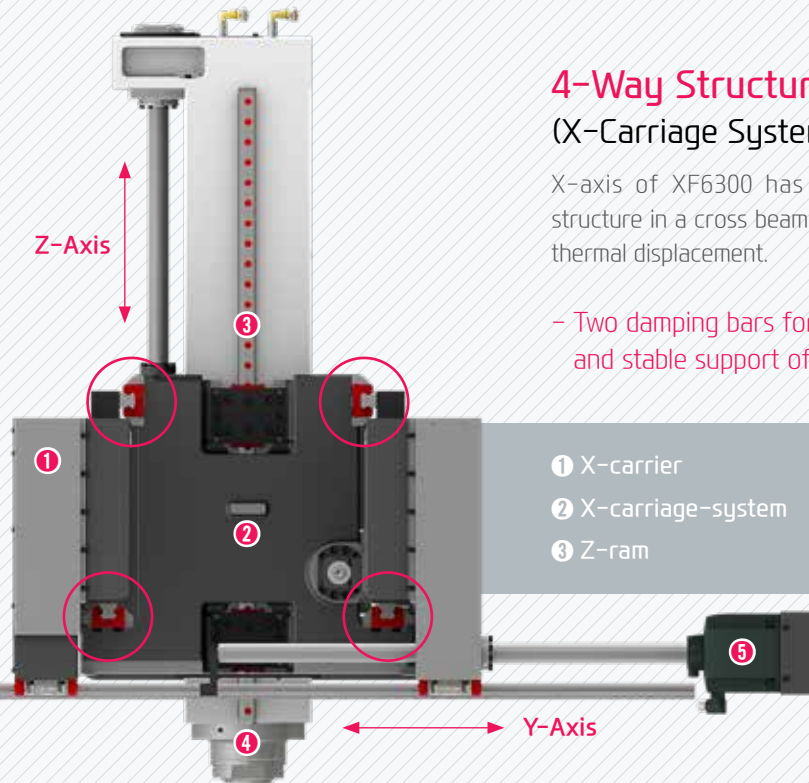
## 4-Way Structure on X Axis
(X-Carriage System)

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

Z-Axis

❶ X-carrier          ❹ Spindle
❷ X-carriage-system  ❺ Drive for Y-carriage-system
❸ Z-ram

Y-Axis

## High-Speed Roller LM Guideway

The XF series 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)
   **XF6300 −** 1.0G/0.8G/1.0G   **XF8500 −** 0.75G/0.75G/0.75G
   ❖ Acceleration/deceleration is slightly different when you choose HEIDENHAIN NC.

## High-Precision Linear Scale (Standard)

**The XF series 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.

# 03

# Built-in Spindle

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

# Built-in Spindle

The built-in spindle minimizes spindle vibration, enabling outstanding performance in a high-precision cutting environment such as mold products.

## 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 : 9K, 15K, 24K | HSK-E40 : 30K, 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 (290/435/1,015 psi)} OPTION
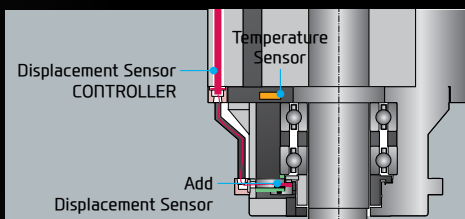
### Spindle Heat Displacemnt Sensor

By attaching a hardware heat displacement sensor to the spindle cartridge, the amount of thermal displacement generated during machining is directly recognized and corrected by the displacement amount.

Heat Displacement Sensor Calibration + Displacement Sensor Calibration

## Spindle

| ITEM | Speed r/min | Power (Max./Cont.) kW (HP) | Torque (Max./Cont.) N·m (lbf·ft) | Tool Holder |
|---|---|---|---|---|
| XF8500 | 9,000 | 42/31(56.3/41.6) | 175/130 (129/95.9) | HSK-A63 |
| XF6300 \| XF8500 | 15,000 | 31/25 (41.6/33.5) | 153/123 (112.8/91) | HSK-A63 |
| XF6300 \| XF8500 | 24,000 | 26/20 (35/27) | 85.9/66.5 (63.4/49) | HSK-A63 |
| XF8500 | 30,000 | 120/80 (160.9/107.3) | 38.2/25.5 (28.2/18.8) | HSK-E40 |
| XF6300 | 40,000 | 26/18 (35/24) | 9.9/6.9 (7.3/5) | HSK-E40 |

# 04

# 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.

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### XF6300

**Ø630** mm (Ø24.8″)
Table size

**Max. 600** kg (1,323 lb)
Max. load capacity

### XF8500

**Ø850** mm (Ø33.4″)
Table size

**Max. 1,000** kg (2,205 lb)
Max. load capacity

XF6300 : Ø800 mm (Ø31.5")
XF8500 : Ø1,000 mm (Ø39.4")

XF6300
600 kg (1,323lb)

XF8500
1,000 kg (2,205 lb)

XF6300 : 500 mm (19.7")
XF8500 : 600 mm (23.6")

## DDM Tilting Rotary Table

The XF series 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.

❖ The XF series may cause some interference in the machining area.
   Please check the interference area chart on page 36 of the catalog.
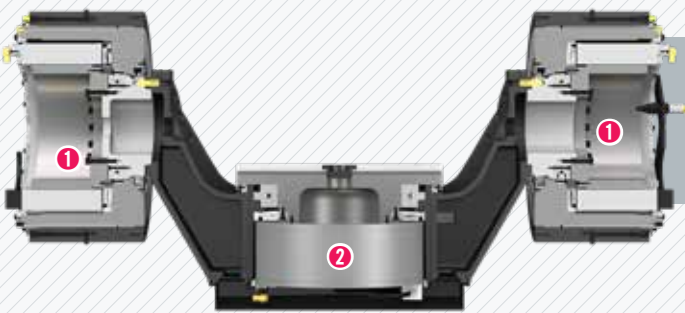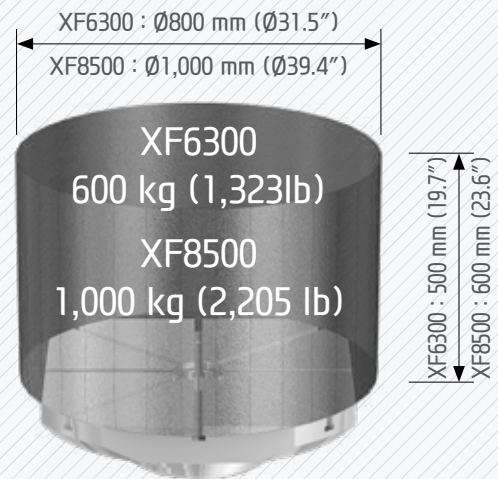


### DDM TABLE (Simultaneous 5-Axis)

❶ A-axis built-in motor (tandem type)

❷ C-axis built-in motor

⦿ **A/C indexing angle** : +30°~−120°/360°

⦿ **XF6300 A/C indexing speed** : 70/110 rpm

⦿ **XF8500 A/C indexing speed** : 50/100 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 Scales (5 sec. precision)

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

XF Series
5-axis Vertical Machining Center

16
+
17

EXPERIENCE
THE NEW TECHNOLOGY

## 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.

<XF8500 : Multi Step Rack Type Magazine & TWIN ARM ATC – Option>

### Rack Type Magazine

## 34 [68, 102] ea
No. of tools

## 4.5 sec
Tool change time (C-C)

❖ C-C : XF6300 – 3kg (6.6lb) tool base
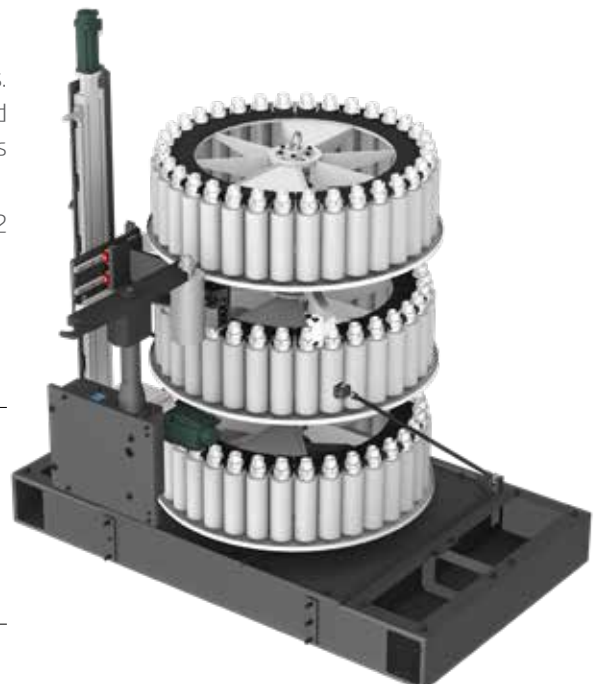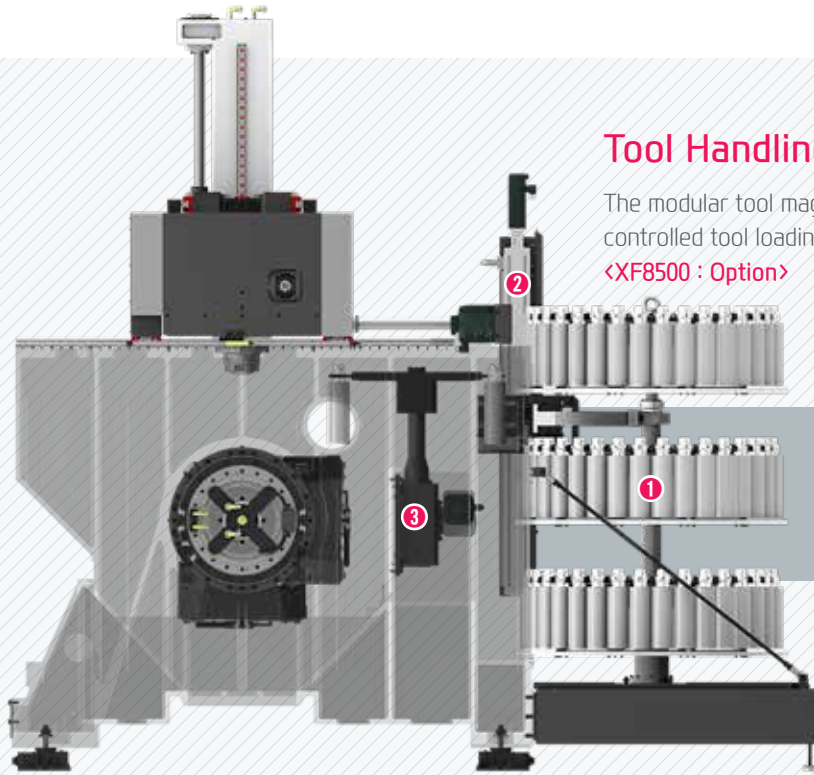
## Tool Handling System (2-Axis Loading)

The modular tool magazine of XF6300 is designed as a 2-axis controlled tool loading system for quick tool change.
‹XF8500 : Option›

❶ Rack Type Tool Magazine
❷ Tool Handling System
❸ 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.

Ø125 (4.9")

300 mm (11.8")

HSK-A63
HSK-E40 (30K, 40K)
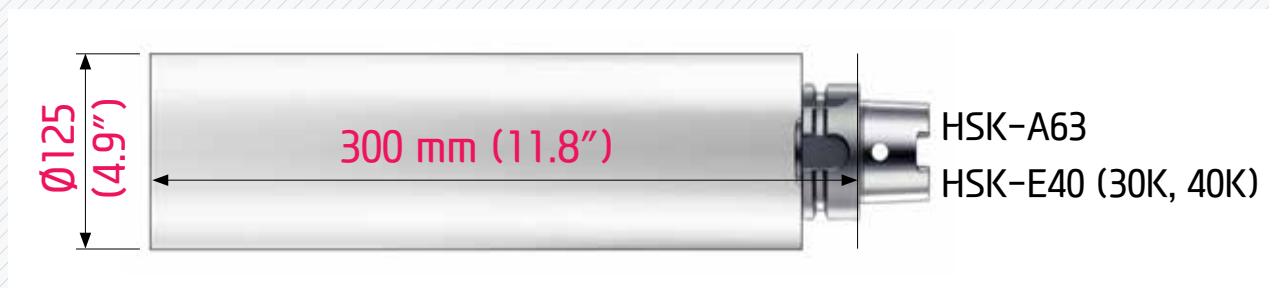
- ⊙ **Max. Tool Dia.** (W/T Adjacent Tool) : Ø90/Ø125 (Ø3.5"/Ø4.9")
- ⊙ **Max. Tool Length** : 300 mm (11.8")
- ⊙ **Max. Tool Weight** : 8 kg (17.6 lb) [**40K** : 1.5 kg (3.3 lb)]

# FAST & DYNAMICS & CONVENIENCE

· 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 XF series pursues.

# 06

**XF Series**

# 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 Controller
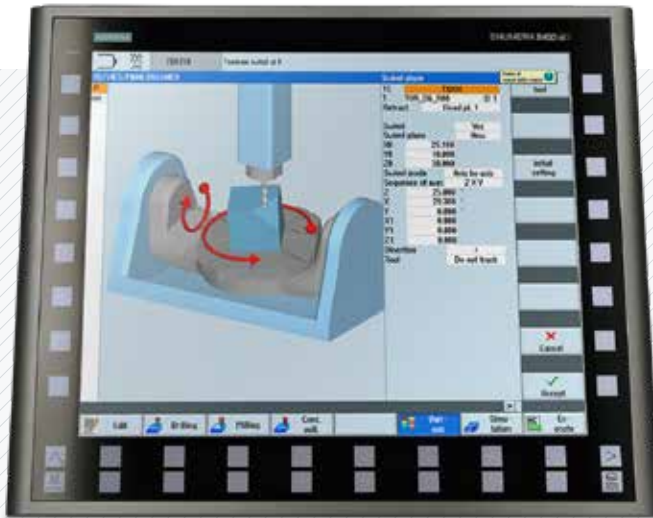
## SIEMENS Technology

### 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
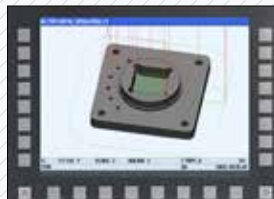
### Easy Screen

- 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)

# HYUNDAI-iTROL+

## The Powerful CNC platform for Machine Tools

**PINUP** DESIGN AWARDS

Simple & Modern Identity

19" Multi-Touch Screen

### DESIGN

#### Add value to Modern Premuim!

Combination of machine tool, IT technology and networking!
HYUNDAI WIA opens new era of Smart Machine with
HYUNDAI-iTROL+

PINUP Design Award Awarded

Ergonomic Design

Robust and High Quality Aluminum Frame

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## HYUNDAI-iTROL+ HYUNDAI Intelligent Control

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

Tilting Angle

30°

| 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 Programming

This cloud-based programming automation system enables programming by inputting a 3D model, one-touch shape analysis, and NC program creation.

- Model file input / 3D modeling function (NX, STEP, IGES, DWG, DXF, etc.)
- One-touch automatic creation of 5-face part machining programs
- 3D simulated machining / forecasting of machining time

## Smart Operation
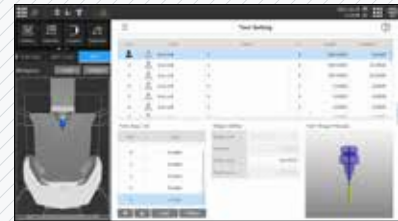
Collision simulation based on a virtual machine can prevent collision caused by worker negligence in the manual mode.

- 3D machining monitoring through the virtual machine and machining function
- Collision prevention function in the manual operation mode
- Enhanced tool and workpiece setting for user convenience

## 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

# HEIDENHAIN

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
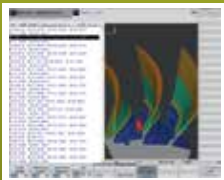
### Detailed Simulation

- 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
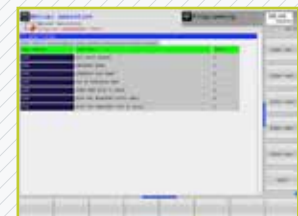
**I/O Monitor**
Sensor & sol. valve status monitoring

**Working Time**
Particular program block analysis
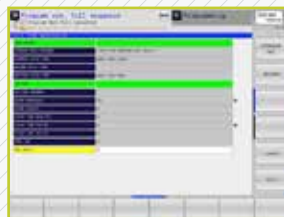
**Cycle Time Monitoring**
Alarm function according to C/T

**Macro Guide**
Macro manual for Hyundai WIA S/W

**Machine Option List**
Machine option list searching & setting
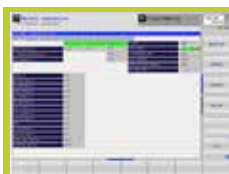
## HW-TDC
HYUNDAI WIA Thermal Displacement Compensation

- 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.

# Mold Package

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

## HYUNDAI-WIA Mold Package

The XF series are 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

❶ MDynamics
(High speed/High accuracy function)

❷ Automatic Power Off Device

❸ PCU50.5 (Hard Disk Included)

❹ Main Spindle Cooling Device (8-channel)

Spindle temperature monitored with embedded thermal sensors

❺ Cutting Air Blow

Mold machining without coolant

❻ 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



Non-uniform surface

Uniform surface

Low accuracy

High accuracy

Machining time : 48 min

Machining time : 33 min

Speed

SINUMERIK + SINAMICS  80bit NANO FP Accuracy

Unbalanced velocity

Balanced velocity
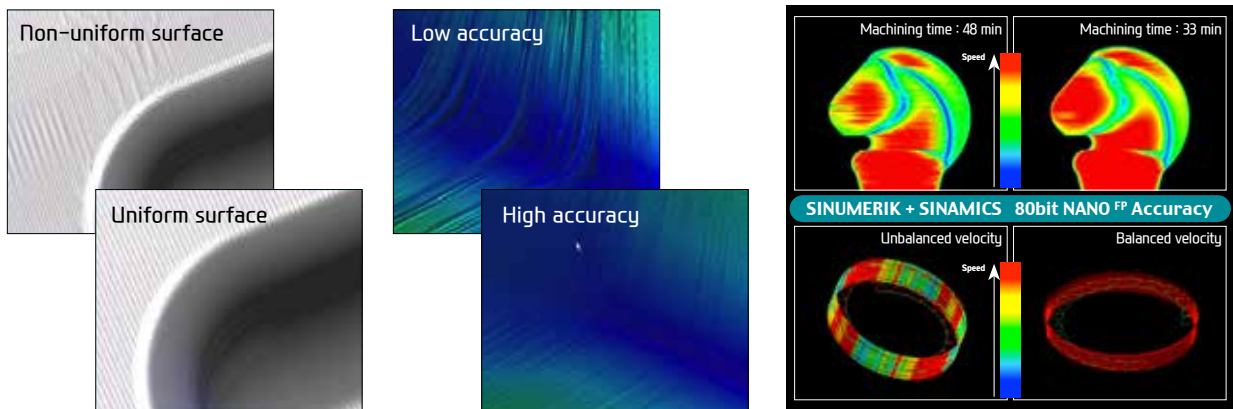
Speed

- 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 User Convenience
Various Devices for User Friendly

## Large 19" Monitor

The XF series 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 (57") Height From the screen center

## Ergonomic Operation Panel

The XF series are 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.

120° (±60°)

# Convenience
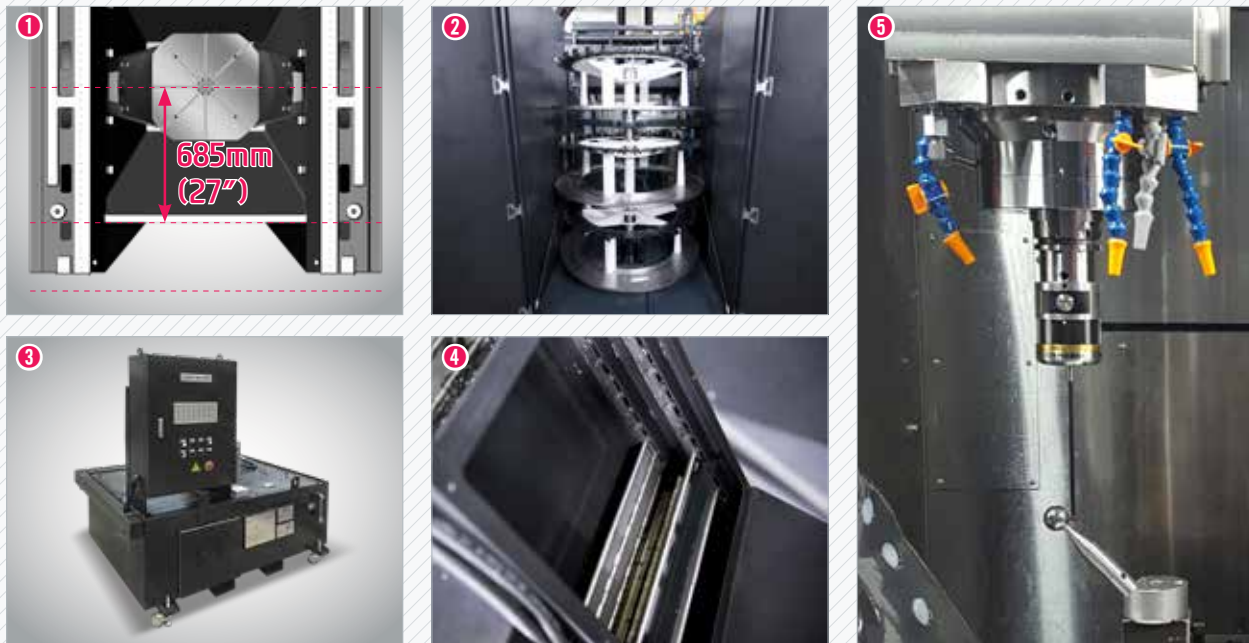


685mm
(27")

❶ **Improved Accessibility to Table**
The short distance (**XF6300** : 685mm [27"], **XF8500** : 676mm [26.6"]) 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.〉
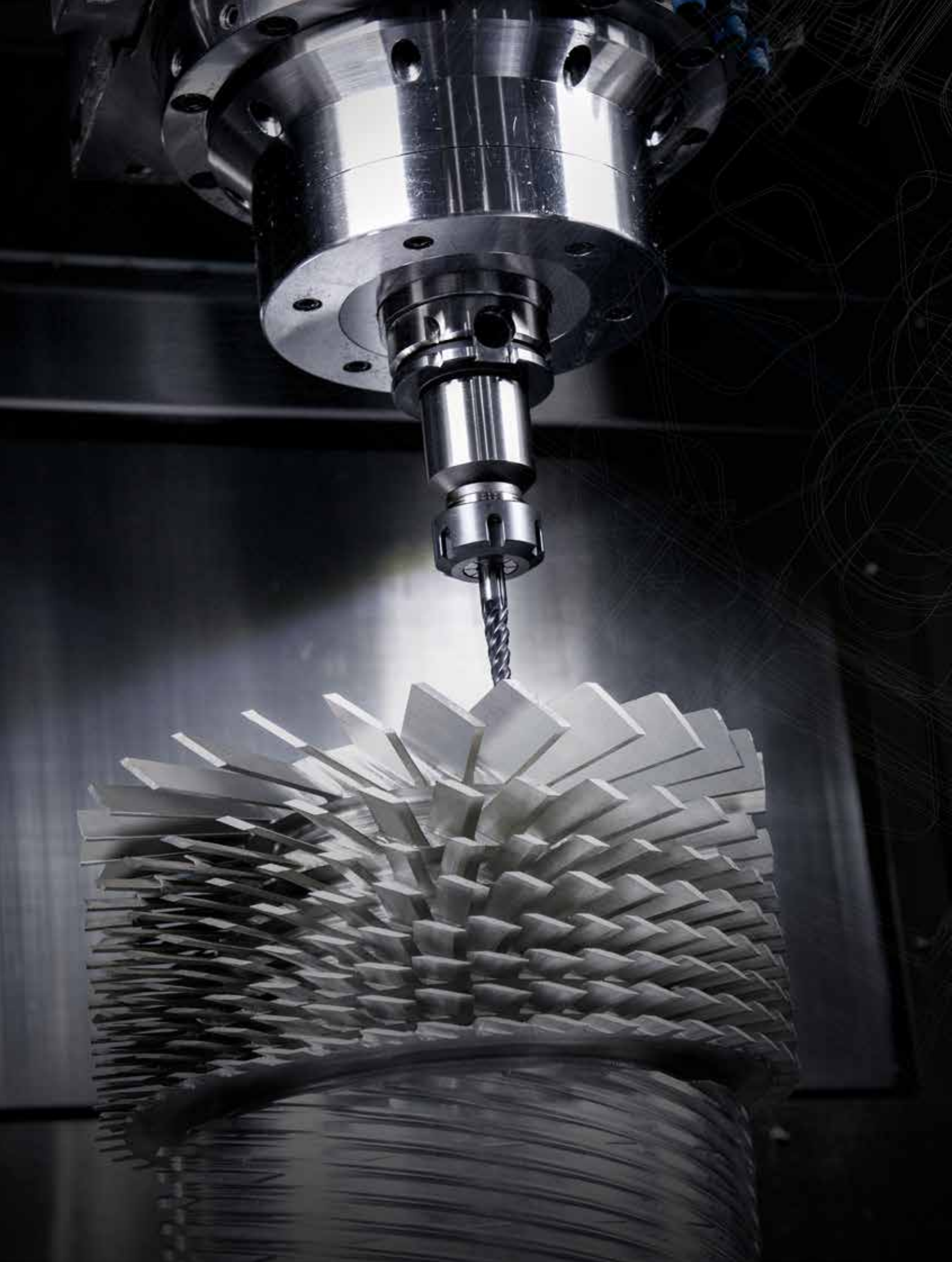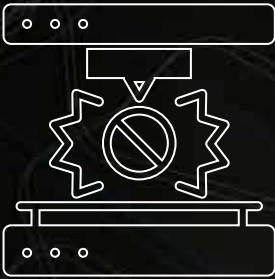
# COLLISION AVOIDANCE

Machine tools cannot completely avoid the risk of collision due to programing errors, operator mistakes and other minor mishaps.

A collision can have a serious impact on the performance of a machine tool's feed axis and spindle, causing considerable losses in terms of lost production, repair costs, etc.

Obviously, the 5-axis machining center is more vulnerable to the risk of collision than the 3-axis machining center, and also tends to sustain far greater damage in the event of a collision.

That is why many buyers of 5-axis machining centers decide to pay a significant amount of money to buy a collision avoidance system generally offered by the manufacturers as an optional feature.

HYUNDAI WIA, however, is committed to ensuring that our customers can operate our machine tools in the safest environment.

As part of our efforts to fulfill such a commitment, HYUNDAI WIA's XF series is equipped with a collision avoidance system as a standard feature.

※ This function is limited to the body of the machine. Collision prevention of the workpiece and jig is not provided.

# SPECIFICATIONS

## Standard & Optional

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

| Spindle | | XF6300 | XF8500 |
|---|---|---|---|
| 9,000 rpm | Bulit-in | – | ○ |
| 15,000 rpm | Bulit-in | ● | ● |
| 24,000 rpm | Bulit-in | ○ | ○ |
| 30,000 rpm | Bulit-in | – | ○ |
| 40,000 rpm | Bulit-in | ○ | – |
| Spindle cooling system | | ● | ● |
| **ATC** | | | |
| ATC extension | 34 | ● | ● |
| | 68 | ○ | ○ |
| | 102 | ○ | ○ |
| Tool shank type | HSK A63 | ● | ● |
| | HSK E40 (30K, 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) | | ○ | – |
| Turning table (800 rpm) | | – | ○ |
| **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 | Cabin (470 ℓ ) | ○ | ○ |
| | Separate Type {1,200 ℓ (317 gal)} | ● | ● |
| Chip conveyor (Wedge wire type) | Left | ○ | ○ |
| | Right | ☆ | ☆ |
| 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 & 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 | | ☆ | ☆ |

| Safety Device | | XF6300 | XF8500 |
|---|---|---|---|
| Collision Aviodance | | ● | ● |
| Total Splash Guard | | ● | ● |
| Door Interlock | | ● | ● |
| **Controller** | | | |
| SIEMENS 840D sl | | ● | ○ |
| HYUNDAI-iTROL+ | | ○ | ● |
| HEIDENHAIN TNC640 | | ○ | ○ |
| **S/W – SIEMENS, HYUNDAI-iTROL+** | | | |
| Machine guidance (HW-MCG) | | ● | ● |
| Tool Monitoring (HW-TM) SIEMENS/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) | | ○ | ○ |
| Tool Offset Measurement (HW-TOM) | | – | – |
| Machining Condition Selection (HW-MCS) | | ● | ● |
| Adaptive Feed Control (HW-AFC) SIEMENS/iTROL+ | | ☆/● | ☆/● |
| Conversational Program (HW-DPRO) | | – | – |
| **S/W – HEIDENHAIN** | | | |
| Advanced function set 1 | | ● | ● |
| Advanced function set 2 | | ● | ● |
| DCM collision | | ● | ● |
| KinematicOpt | | ● | ● |
| 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 | ○ | ○ |
| 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 | ○ | ○ |
| | 8 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)

# SPECIFICATIONS

## Spindle Output/Torque Diagram

### XF6300 Spindle

| Std. | 15,000 rpm | HSK–A63 |
|---|---|---|
| Opt. | 24,000 rpm | |
| | 40,000 rpm | HSK–E40 |

### XF8500 Spindle

| Std. | 15,000 rpm | HSK–A63 |
|---|---|---|
| Opt. | 9,000 rpm 24,000 rpm | |
| | 30,000 rpm | HSK–E40 |

#### 24,000 rpm

Power(kW[HP])　　Torque(N·m[lbf·ft])

85.9N·m[63.4lbf·ft] (S6-40%, 2min)
26kW[34.9HP] (S6-40%, 2min)
66.5N·m[49lbf·ft] (S1, Cont.)
20kW[26.8HP] (S1, Cont.)

85.9 [63.4]
66.5 [49]
9.6[7]
8[5.9]

26 [34.9]
24 [32.2]
20 [26.8]

2,870　7,160　24,000

Spindle Speed (r/min)

#### 9,000 rpm

Power(kW[HP])　　Torque(N·m[lbf·ft])

175N·m[129.1lbf·ft] (S6, 40min)
42kW[56.3HP] (S6, 40%)
130N·m[95.9lbf·ft] (Cont.)
31kW[41.6HP] (Cont.)

175 [129.1]
130 [95.9]
16 [11.8]

42 [56.3]
31 [41.6]

2,300　9,000

Spindle Speed (r/min)

#### 30,000 rpm

Power(kW[HP])　　Torque(N·m[lbf·ft])

120kW[160.9HP] (S6-25%, 2min)
104kW[139.4HP] (S6-40%, 2min)
92kW[123.4HP] (S6-60%, 2min)
80kW[107.3HP] (S1. Cont.)
38.2N·m[28.2lbf·ft] (S6-25%, 2min)
33.1N·m[24.4lbf·ft] (S6-40%, 2min)
29.3N·m[21.6lbf·ft] (S6-60%, 2min)
25.5N·m[18.8lbf·ft] (S1. Cont.)

120 [160.9]
104 [139.4]
92 [123.4]
80 [107.3]

38.2 [28.2]
33.1 [24.4]
29.3 [21.6]
25.5 [18.8]

30,000

Spindle Speed (r/min)

#### 15,000 rpm

Power(kW[HP])　　Torque(N·m[lbf·ft])

153N·m[112.8lbf·ft] (S6, 40min)
31kW[41.6HP] (S6, 40%)
123N·m[90.7lbf·ft] (Cont.)
25kW[33.5HP] (Cont.)

153 [112.8]
123 [90.7]
16 [11.8]

31 [41.6]
25 [33.5]

1,920　4,530　15,000

#### 40,000 rpm

Power(kW[HP])　　Torque(N·m[lbf·ft])

26kW[34.9HP] (S6-40%)
18kW[24.1HP] (Cont.)
9.9N·m[7.3lbf·ft] (S6-40%)
6.9N·m[5.1lbf·ft] (Cont.)

9.9 [7.3]
6.9 [5.1]

26 [34.9]
18 [24.1]

25,000　40,000

# SPECIFICATIONS

unit : mm (in)

## XF6300

Tilting : A-axis 0°

650 (25.6) (X STROKE)

325 (12.8)  325 (12.8)

600 (23.6) (Y STROKE)

300 (11.8)  300 (11.8)

719.5 (28.3)

500 (19.7) Z STROKE

219.5 (8.6)

Table Top : A-axis Center

100 (3.9)

400 (15.7)

Max. WORK HEIGHT

FRONT

LEFT

## Spindle & Table Travel Range

unit : mm (in)

### XF6300

Tilting : A-axis -90°



600 (23.6) (Y STROKE)
300 (11.8) 300 (11.8)

325 (12.8) 325 (12.8)
650 (25.6)
(X STROKE)

300 (11.8) 300 (11.8)
600 (23.6) (Y STROKE)
275.2 (10.8)

500 (19.7) Z STROKE

119.8 (4.7)

321 (12.6)
100 (3.9)
Table Top : A-axis Center

FRONT

LEFT

# SPECIFICATIONS

unit : mm (in)

## XF8500

Tilting : A-axis 0°

850 (33.4)-X STROKE

425 (16.7) | 425 (16.7)

920 (36.2)-Y STROKE

460 (18.1) | 460 (18.1)

850 (33.4)

600 (23.6) Z STROKE

250 (9.8)

130 (5.1)

Table Top to A-axis Center

600 (23.6) Max. WORK HEIGHT

FRONT

LEFT

# SPECIFICATIONS

Spindle & Table Travel Range

unit : mm (in)

## XF8500

Tilting : A-axis -90°



850 (33.4)-X STROKE
425 (16.7)  425 (16.7)

920 (36.2)-Y STROKE
460 (18.1)  460 (18.1)

600 (23.6) Z STROKE

250 (9.8)

440 (17.3)

510.5 (20)

FRONT

LEFT
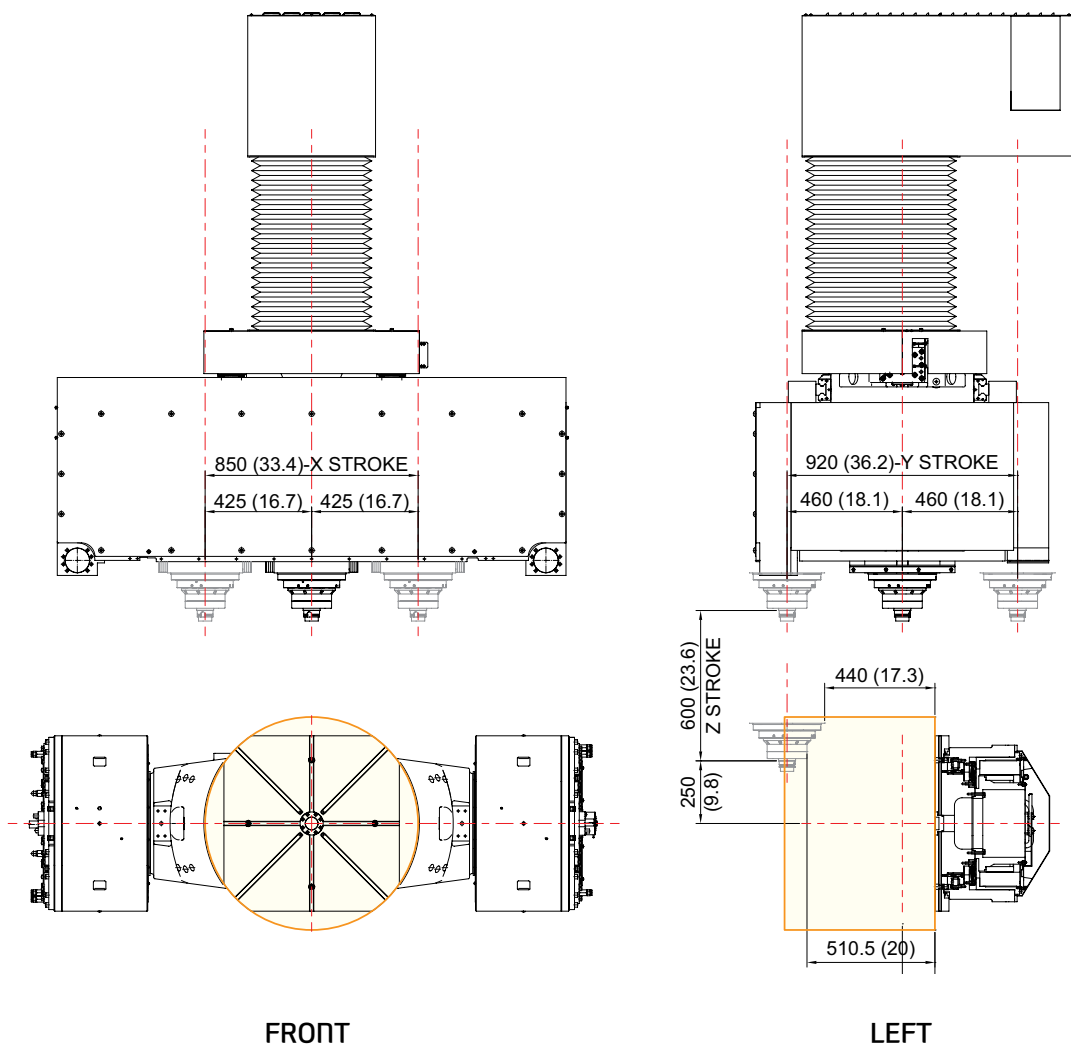
# SPECIFICATIONS

## Table Dimensions

**XF6300** : Ø630(24.8)
**XF8500** : Ø850 (33.4)

14
(0.55)

24
(0.94)

10
(0.4)

21
(0.83)

**T Slot Detail**
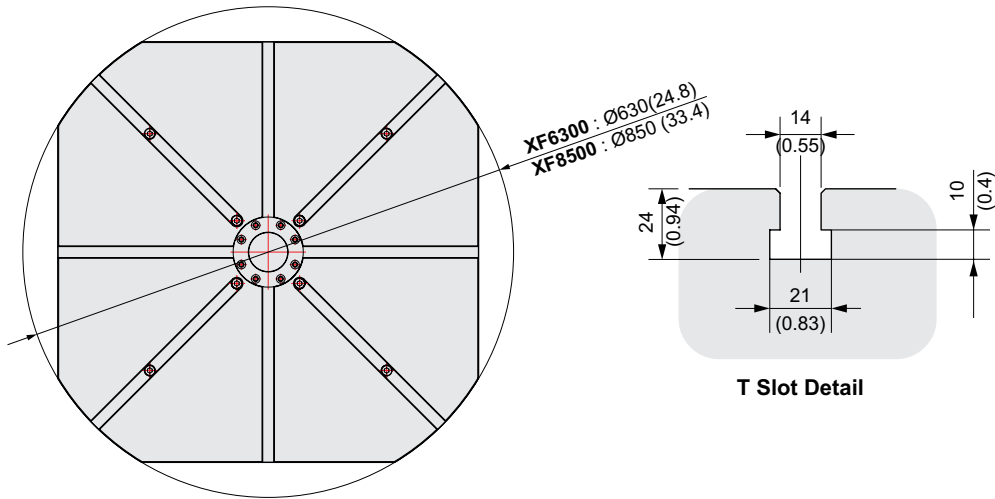
## Tool Shank

### HSK-A63 (9,000rpm / 15,000rpm / 24,000rpm)

25.6 (1)   25.6 (1)
20 (0.8)

20 (0.8)
16 (0.6)

12.54 H8 (0.5)

Ø10 (0.4)

14.7 (0.6)   60°

Ø48 (1.9) $^{+0.011}_{+0.007}$   Ø46.53 (1.83) $^{+0.007}_{+0.003}$

18 (0.7)   Ø63 (2.5)

6.3 (0.24)   18 (0.7)   13 (0.5)
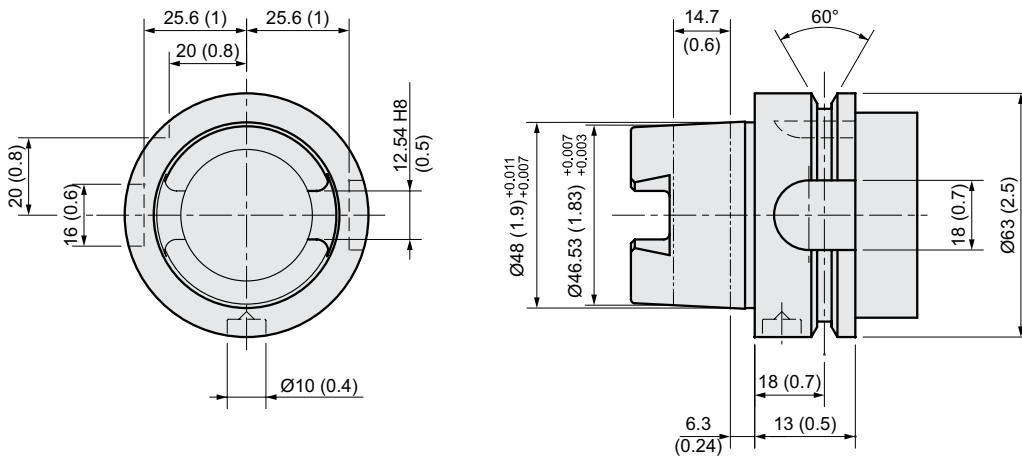
### HSK-E40 (30,000rpm / 40,000rpm)

30°

Ø25.5 (1)   Ø23 (0.9)   Ø21 (0.82)

8

11.42 (0.45)   8 (0.3)

60°

Ø30 $^{+0.007}_{+0.005}$ (1.2)   Ø29.05 $^{+0.005}_{+0.003}$ (1.14)

Ø34 (1.33)   Ø40 (1.57)

4 (0.15)
9.5 (0.4)   16 (0.63)

20 (0.8)   20 (0.8)   15 (0.6)
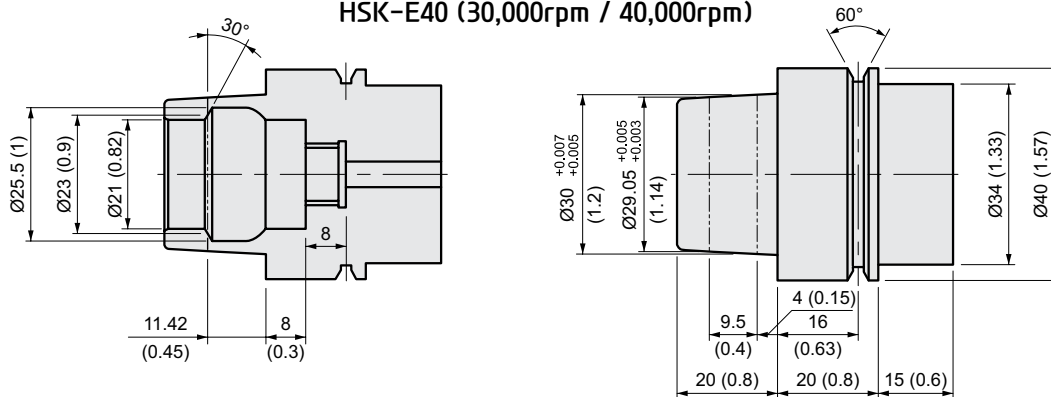
# SPECIFICATIONS

## External Dimensions

### XF6300

5032 (198)

1000 (39.4) | 650 (25.6) | 2120 (83.5) | 1262 (49.7)

3506 (138)
4380 (172.4)
874 (34.4)

Spindle cooling device
Positions can be changed

3314 (Max. Height)
3044 (Machine Height)
2814 (Packing Height )
2794 (Min. Height)

3236.8 (127.4)
1734 (68.3)
650 (25.6)

1445.4 (57)
1453 (57.2)

1650 (65) | 2120 (83.5) | 1262 (49.7)

1661 (65.4)
680 (26.8)
560 (22)
120 (4.7)

# SPECIFICATIONS

## XF8500



6461 (254.4)

1000 (39.4)　930 (36.6)　2740 (107.9)　1791 (70.5)

4550 (179.1)

5440 (214.2)

890 (35)

Spindle cooling device
Positions can be changed

4131 (162.6)-Max. Height
3831 (150.8)-Machine Height
3545 (139.6)-Packing Height
3531 (139)-Min. Height

1444 (56.9)

1733 (68.2)

3606 (142)

1486 (58.5)

1650 (65)　2740 (107.9)　1791 (70.5)

1769 (69.6)

660 (26)

120 (4.7)

4550 (179.1)　890 (35)

5440 (214.2)

# 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(lxH) | | 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 | 380/60 |
| **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 36 of the catalog.

Specifications are subject to change without notice for improvement.

# SPECIFICATIONS

## Specifications

| MODEL | | | | XF8500 |
|---|---|---|---|---|
| **TABLE** | Table Size | | mm(in) | Ø850 (Ø33.4") |
| | Maximum Load Capacity | | kg(lb) | 1,000 (2,205) |
| | ※Max. Macining Height(lxH) | | mm(in) | Ø1,000×600 (Ø39.4"x23.6") |
| | Table Driving Method | | mm(in) | DDM |
| **SPINDLE** | Spindle Taper | | – | HSK-A63 [30K : HSK-E40] |
| | Spindle RPM | | r/min | 15,000 [9,000] [24,000] [30,000] |
| | Spindle Power Output (Max./Cont.) | | kW(HP) | 31/25 (41.6/33.5) [42/31(56.3/41.6)] [26/20 (35/27)] [120/80 (160.9/107.3)] |
| | Spindle Torque (Max./Cont.) | | N·m(lbf·ft) | 153/123 (112.8/91) [175/130 (129/95.9)] [85.9/66.5 (63.4/49)] [38.2/25.5 (28.2/18.8)] |
| | Spindle Driving Method | | – | BUILT-IN |
| **FEED** | Travel | X/Y/Z Axis | mm(in) | 850/920/600 (33.4"/36.2"/23.6") |
| | | A/C Axis | deg | 150° (+30°~−120°)/360° |
| | Distance from Table Top to SP. Nose | | mm(in) | 250~850 (9.8"~33.4") |
| | Rapid Traverse Rate | X/Y/Z Axis | m/min(ipm) | 45/45/45 (1,772/1,772/1,772) |
| | | A/C Axis | r/min | 50/100 (DDM) |
| | Slide Type | | – | ROLLER GUIDE |
| **ATC** | Number of Tools | | ea | PICK UP : 34 [TWIN ARM : 68, 102] |
| | Tool Shank | | – | HSK-A63 [30K : 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) [30K : 1.5 (3.3)] |
| | Tool Change Time | C-C | sec | 6.8 |
| | 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 | 380/60 |
| **MACHINE** | Floor Space (L×W) | | mm(in) | 4,907x5,440 (193.2"x214.2") |
| | Machine Size (L×W) | | mm(in) | 2,740x5,440 (107.9"x214.2") |
| | Height | | mm(in) | 3,831 (150.8) |
| | Weight | | kg(lb) | 21,000 (46,297) |
| **CNC** | Controller | | – | HYUNDAI-iTROL⁺ [HEIDENHAIN TNC640] |

※ If the machining area exceeds Ø850× 600(Ø33.4"x23.6"), 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.

## 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 |
| 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 |
| Alarm Guidance | Provide corrective measure for the alarm with PLC I/O status and save 4-month history of the alarm |
| Collision avoidance for manual operation mode | Function designed to prevent machine/workpiece collision during the manual operation mode (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 |

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## 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)

| | |
|---|---|
| Advanced function set 1 | 1. Rotary table machining / 2. Coordinate transformations / 3. Interpolation |
| Advanced function set 2 | 1. 3-D machining / 2. Interpolation |
| DCM : Dynamic Collision Monitoring | Collision monitoring for safety machining operation |
| Kinematic Opt | Easy calibration of rotary axes |

### HEIDENHAIN S/W OPTION (Customer Option)

| | |
|---|---|
| Display step  (micron control) | Linear axis : 0.1 μm (std) → 0.01 μm (with option #23) / Angular axis : 0.0001° (std) → 0.00001° (with option #23) |
| DXF converter | Importing contours and machining options from DXF files |
| AFC : Adaptive Feed Control | Controls the feed rate depending on the machine situations |
| Kinematic comp (3-D spatial compensation) | Improves machine accuracy by compensation of geometry errors |
| CTC : Cross Talk Compensation | Compensation of position errors through axis coupling to improve quality and accuracy |
| PAC: Position Adaptive Control | Position-dependent adaptation of control parameters |
| LAC : Load Adaptive Control | Adjust the parameters of the feedforward control to the current mass of the workpiece |
| ACC : Active Chatter Control | Reduces chattering during heavy cutting to decrease tool mark and machine load |
| AVD : Active Vibration Damping | Vibration damping by adjusting of the jerk for better surfaces |

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