

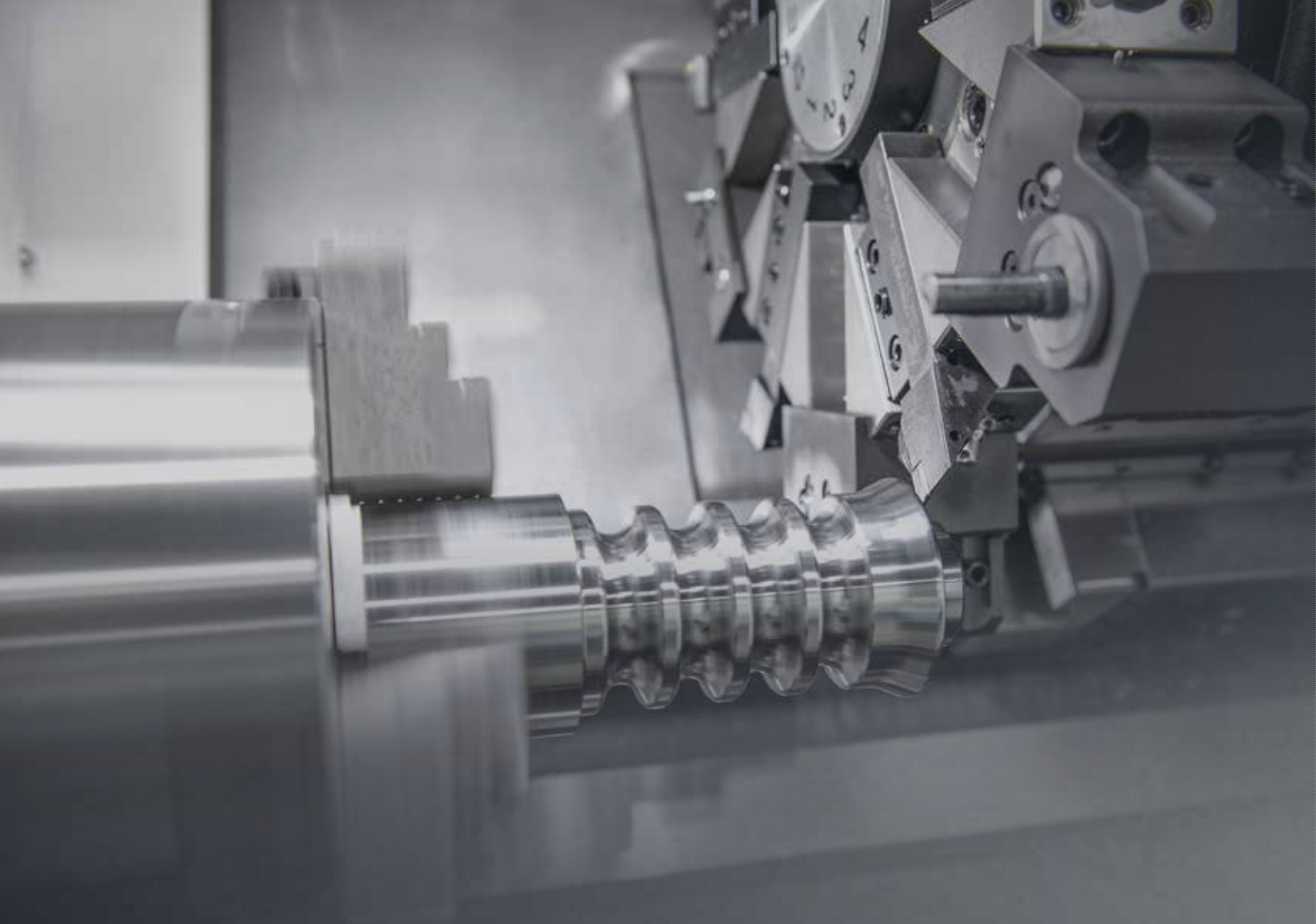
# HD

## 2600/3100 Series

HD2600/L/M/LM | HD3100A/MA | HD3100/M/L/LM

**WIA Machine Tools** Heavy Duty Cutting CNC Turning Center

**WIA** MACHINE TOOLS



# Technical Leader

The CNC Turning Center **HD2600/3100 Series**, designed by WIA machine tools with years of expertise and the latest technology, is a Turning Center that maximizes productivity and performance.

| ITEM     | Chuck |     | Bed (Z-Axis) |       |         |         | Standard Turret |            | Mill Turret |       |
|----------|-------|-----|--------------|-------|---------|---------|-----------------|------------|-------------|-------|
|          | 10"   | 12" | 680mm        | 830mm | 1,000mm | 1,350mm | 10 Station      | 12 Station | BMT55       | BMT65 |
| HD2600   | ●     | ○   | ●            |       |         |         | ●               | ○          |             |       |
| HD2600M  | ●     |     | ●            |       |         |         |                 |            | ●           |       |
| HD2600L  | ●     | ○   |              |       | ●       |         | ●               | ○          |             |       |
| HD2600LM | ●     |     |              |       | ●       |         |                 |            | ●           |       |
| HD3100A  | ●     |     |              | ●     |         |         | ●               | ○          |             |       |
| HD3100MA | ●     |     |              | ●     |         |         |                 |            |             | ●     |
| HD3100   |       | ●   |              | ●     |         |         | ●               | ○          |             |       |
| HD3100M  |       | ●   |              | ●     |         |         |                 |            |             | ●     |
| HD3100L  |       | ●   |              |       |         | ●       | ●               | ○          |             |       |
| HD3100LM |       | ●   |              |       |         | ●       |                 |            |             | ●     |

●: Standard ○: Option

# HD

## 2600/3100 Series

Lathe with Box Guideways for Heavy Cutting

- Box guideways for heavy-duty cutting
- Stabilized unit structure to minimize thermal displacement
- User convenient structure for high productivity
- Excellent rapid traverse rate: 30m/min [1,181ipm] (Z-axis)
- High-rigidity and high-speed servo turret (Expanded disk width)
- Ergonomic design for convenient access to chuck and tool



# 01 BASIC STRUCTURE

High Productivity 10/12inch CNC Turning Center for Heavy Duty Cutting

## Turret

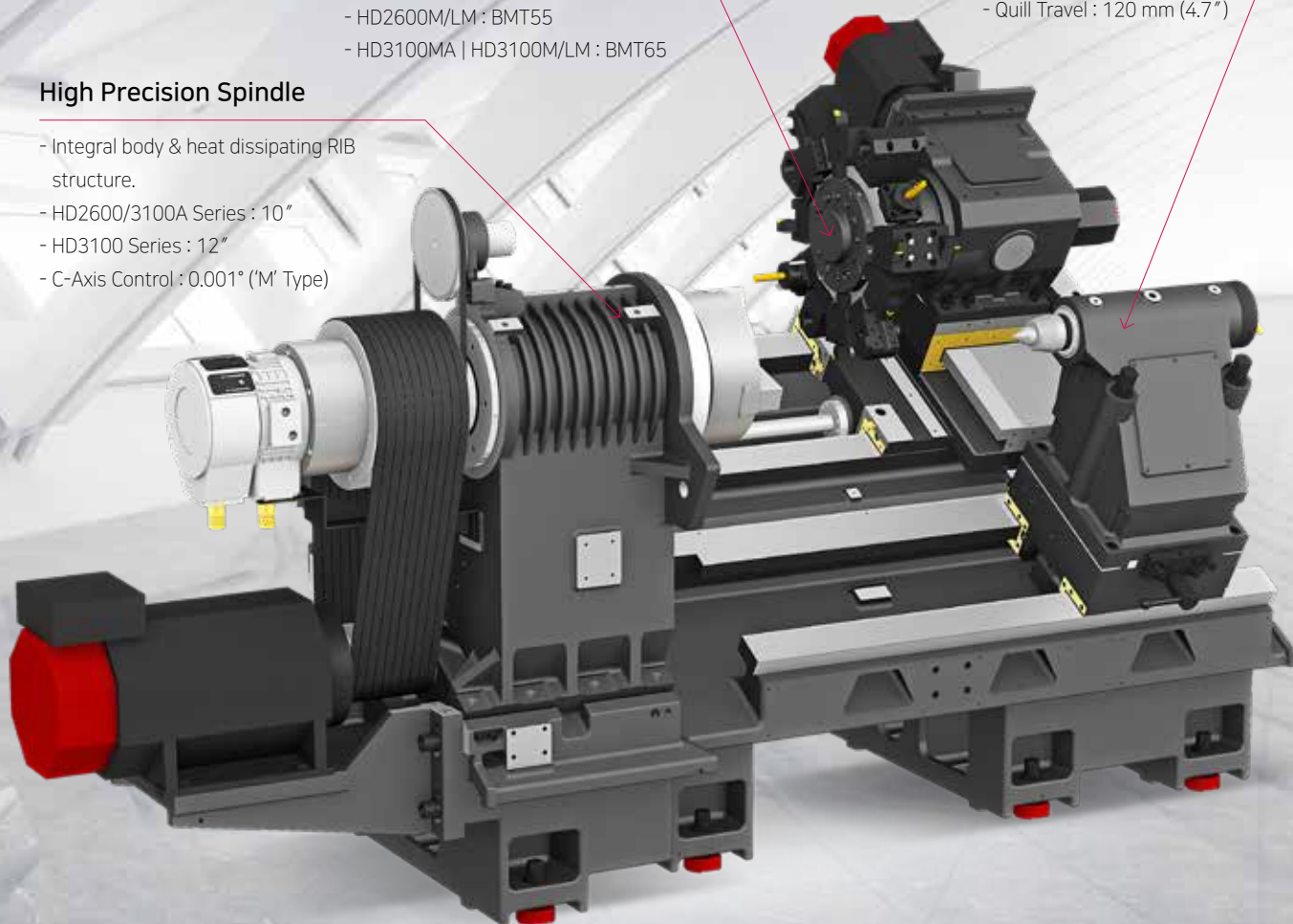
- 10 [Opt. 12] EA
- O.D./I.D : □25/Ø50
- HD2600M/LM : BMT55
- HD3100MA | HD3100M/LM : BMT65

## Tail Stock

- MT#5
- Quill Dia. : Ø100 (3.9")
- Quill Travel : 120 mm (4.7")

## High Precision Spindle

- Integral body & heat dissipating RIB structure.
- HD2600/3100A Series : 10"
- HD3100 Series : 12"
- C-Axis Control : 0.001° ('M' Type)



# POWERFUL CUTTING CAPABILITY & WIDE CUTTING AREA

## ALL-IN-ONE TYPE OF BED

### Optimal Structural Analysis

Structural analysis was applied to the design of the machine to increase the tool post body and reduce the machine's height so as to maintain the bed's dynamic rigidity even during heavy-duty cutting.

In addition, the HD2600/3100's bed slope is pitched at 30° to ensure more stable machining.



### Integrated Coolant Tank

The structure is designed with the coolant tank installed at the bed front for improved convenience. Chips can be removed from the right side of the machine.

## GUIDEWAY

### Box Guideway on All Axis

With the mounting of box guideways on all axis, the machine offers excellent vibration absorption even against during heavy-duty cutting, enabling high-quality machining.

### Closed-type GIB Structure

The guide attachment surface of X-axis guideway has been changed to a sealed GIB structure to minimize X-axis turcite damage caused by chips. As a result, the machining capacity has been greatly enhanced too.

Rapid Traverse Rate (X/Z axis) : **24/30** m/min (945/1,181 ipm)



6-Face constraint design for improved travel capacity

### Travel (X/Z)

| HD2600/M          | HD2600L/LM          | HD3100/A/MA/M     | HD3100L/LM          |
|-------------------|---------------------|-------------------|---------------------|
| <b>265/680</b> mm | <b>265/1,100</b> mm | <b>265/830</b> mm | <b>265/1,350</b> mm |
| (10.4"/26.8")     | (10.4"/43.3")       | (10.4"/32.6")     | (10.4"/53.1")       |



# 02 HIGH PRECISION SPINDLE

Long Lasting, High Accuracy & Excellent Performance CNC Turning Center

## Spindle Specifications

[   ] : Option

| Model      | Speed r/min             | Motor (Max./Cont.)                      | Max. Torque                                |
|------------|-------------------------|-----------------------------------------|--------------------------------------------|
| HD2600     | FANUC 3,500 [2,800] rpm | 26/18.5 kW (35/25 HP)                   | 734 [1,123] N·m (541.4 [828.7] lbf.ft)     |
| HD2600L    | FANUC 3,500 rpm         | 26/18.5 kW (35/25 HP)                   | 734 [1,123] N·m (541.4 [828.7] lbf.ft)     |
| HD2600M    | FANUC 3,500 rpm         | 26/18.5 kW (35/25 HP)                   | 734 N·m (541.4 lbf.ft)                     |
|            | [SIEMENS 3,000 rpm]     | [53.2/28 kW (71.3/37.5 HP)]             | [1,015.6 N·m 749.1 lbf.ft]                 |
| HD2600LM   | FANUC 3,500 rpm         | 26/18.5 kW (35/25 HP)                   | 734 N·m (541.4 lbf.ft)                     |
| HD3100A/MA | FANUC 3,500 rpm         | 26/18.5 kW (35/25 HP)                   | 734 N·m (541.4 lbf.ft)                     |
| HD3100/L   | FANUC 2,800 rpm         | 26/18.5 [35/32] kW (35/25 [47/29.5] HP) | 1,123 [1,613] N·m (828.7 [1,189.7] lbf.ft) |
| HD3100M/LM | FANUC 2,800 rpm         | 26/18.5 kW (35/25 HP)                   | 1,123 N·m (828.7 lbf.ft)                   |

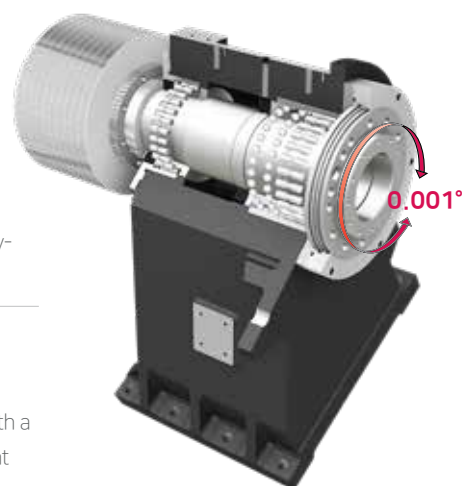
# HEAVY DUTY CUTTING & HIGH ACCURACY

## SPINDLE

### Spindle Ideal for Heavy Cutting

The HD2600 and HD3100 feature torque of 734N·m and 1,123N·m, respectively, ensuring excellent performance in heavy-duty cutting, interrupted cutting, and so on. (specially designed for extra heavy workpiece)

In particular, the HD3100 features a gear spindle as an option [gear : 1,613N·m torque], thus meeting customer needs for a stronger heavy-duty cutting function.



### Ribstar Belt

Also, machining performance is enhanced by **applying ribstar belt** to minimize noise and belt slipping problems. The spindle is designed with a **labyrinth structure** to minimize possible bearing damage from coolant and to improve machining stability.

### C-Axis Control ('M' Type)

C-axis of HD2600M/3100M Series can be controlled to 0.001° which makes it possible to process various shapes.

## TAIL STOCK

### MT#5 Tail Stock

The HD2600 and HD3100 are fitted with tailstocks as a standard for excellent machining quality. In addition, the travel distance of quill can be as long as 120mm (4.7"), thus expanding the support area.

- Quill Dia. :  $\varnothing 100$  mm (3.9")
- Quill Travel : 120 mm (4.7")
- Reinforced Tailstock Rigidity : Thrust 742 kgf → **989** kgf



# 03 SERVO TURRET

High speed, High Accuracy, Highly Reliable Servo Turret

## Servo Turret

[ ] : Option

| No. of Tools          | Tool Size (O.D/I.D)  | Indexing Time       |
|-----------------------|----------------------|---------------------|
| 10 [12] <sub>EA</sub> | □25/Ø50 mm (□1"/Ø2") | 0.15 <sub>sec</sub> |

\* HD2600M : □25/Ø40 mm (□1"/Ø1 1/2")

## Mill Turret

[ ] : Option

| Model                  | Type  | Speed               | Motor (Max./Cont)         | Torque (Max./Cont)                 |
|------------------------|-------|---------------------|---------------------------|------------------------------------|
| HD2600M/LM             | BMT55 | FANUC 6,000 rpm     | 5.5/3.7 kW (7.4/5 HP)     | 52.5/26.5 N·m (38.7/19.5 lbf·ft)   |
|                        |       | [SIEMENS 6,000 rpm] | [4.2/2.8 kW (5.6/3.8 HP)] | [40.1/26.7 N·m (29.6/19.7 lbf·ft)] |
| HD3100MA<br>HD3100M/LM | BMT65 | FANUC 5,000 rpm     | 5.5/3.7 kW (7.4/5 HP)     | 70/35.4 N·m (51.6/26.1 lbf·ft)     |
|                        |       | [FANUC 5,000 rpm]   | [7.5/3.7 kW (10/5 HP)]    | 95.5/35.4 N·m (70.4/26.1 lbf·ft)   |



# VARIOUS DRIVEN PRECISION VDI TOOL HOLDERS

## TURRET

### Servo Turret

The turret of HD2600/3100 series is joined with a high performance AC servo motor, improving machining reliability.

The 3-piece coupling shows excellent performance in indexing. Powerful hydraulic tool clamping minimizes tool tip deviation caused by workload.

### High Pressure Coolant **OPTION**

Turret is designed to utilize 20 bar (290 psi) high pressure coolant and it shows optimum performance in machining difficult-to-cut material.

◎ Static-Rigidity Increased : I.D 20%, O.D 3% ↑

HD2600

90 mm (3.5") 20% UP

HD3100/A

120 mm (4.7") 20% UP



### BMT Turret

BMT turret where each holder is fixed with 4 screws, shows outstanding performance in milling, drilling and tapping during heavy-duty cutting.

STRAIGHT MILLING HEAD



ANGULAR MILLING HEAD



### Mill Tool Holder

Machining capability has increased with the addition of straight milling head tool holder, which can machine workpieces from the side, and angular milling head tool holder, which can perform I.D. operations.



### Special Tool

**OPTION**

The HD2600/3100 series can process high value-added products using a variety of rotating tools. In particular, there is a multi-holder for attaching a variety of tools to one holder, and an eccentric rotary tool for handling eccentric parts without additional axis travel, which can realize integration of process with one machine.

※ Consultation needed when ordering these options.

# 04 USER CONVENIENCE

Various Devices for User Friendly

## BAR FEEDER SYSTEM

### Bar Feeder

Bar feeder system enables automation which leads to efficiency improvement.



#### Parts Catcher

An optional parts catcher collects finished parts without the need to open the door, adding productivity, especially when a bar feeder is attached.



#### Parts Conveyor

The parts conveyor transfers the finished workpiece unloaded by the parts catcher for user convenience.



#### Auto Door

Using M-code, the doors can be automatically opened and closed which brings productivity and convenience for automation.



#### Auto Shutter

Using auto shutter, automation system with gantry loader is possible without opening the machine's door.

## GANTRY LOADER SYSTEM

### Gantry Loader Machining Process

The high speed gantry loaders and the work stocker allow the implementation of automation cells. This enables flexible machining process and productivity enhancement. Optimization of the installation space is also possible.



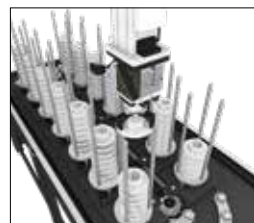
Raw Material

1st Machining

Turn Over

2nd Machining

End Product



Unloading & Loading

Unloading & Loading

Optional

## CHIP DISPOSAL SOLUTION

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



|               |                                                                                     |                                  |                          |
|---------------|-------------------------------------------------------------------------------------|----------------------------------|--------------------------|
| Hinge         | Chip Type : Roughing Chip, Long Chip, Chip complex                                  | Material : SS41, 45C, Cast Steel | Front-Right<br>Direction |
|               | Highly efficient when disposing a lot of chips. Capable of handling stringy chips.. |                                  |                          |
| Scraper       | Chip Type : Finely broken chip blown out                                            | Material : cast Iron, Nonferrous |                          |
|               | Convenient for shortly cut chips.                                                   |                                  |                          |
| ※ Drum Filter | Chip Type : Powder, Micro Chip                                                      | Material : AL                    |                          |
|               | Advantageous in precision, as the chips do not flow in to the coolant nozzle.       |                                  |                          |

※ When ordering a drum filter chip conveyor, prior consult with hyudai via's sales person.

## HIGH PRECISION SYSTEM & COOLANT UNIT



Automatic Q-Setter



Linear Scale



Work Probe



Standard Coolant (Nozzle)



Chuck Coolant (Upper Chuck)



Chuck Air Blow (Upper Chuck)

# 05 FANUC - SMART PLUS

The Compatible All-round Control



15" Touch-type Monitor as a standard

Smart Machine Control

Conversational Program

i-HMI

Part Program Storage

No. of Registerable Programs

Fast Cycle Time Technology

Fine Surface Technology

Smart Servo Control Technology

SmartGuide-i

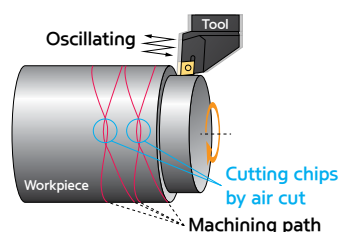
Machining-aid Function

5120M (2MB)

1000 EA

## Servo Learning Oscillation Function for ChipBreaking **OPTION**

- **Machining Method** : The tool cuts the workpiece moving in a zigzag pattern. (Oscillating) → Air cut section occurs → Long chips break
- **Advantage** : Increase tool life, Enhance surface finishing, Improve chip disposal
- **Machine** : All turning centers with FANUC controller (Option)



(Developed special screen page for servo learning oscillation function / Even when this function is applied, the cycle time remains same.)



## 8Ch. Thermal displacement compensation **OPTION**



Control Software

Thermal Sensor

Spindle thermal displacement error correction

Thermal Sensor

Structure thermal displacement error correction

Machine tools generate thermal displacement due to heat during machining.

WIA machine tools detect thermal changes through thermal sensors installed on the main thermal sources of the machine.

In addition, a thermal displacement compensation device that predicts the amount of thermal displacement according to the amount of thermal change and provides a command to the motor with a compensated value to maintain consistent precision is provided as an option.

## SMART CNC (FANUC Smart Plus)



### 1. Dialogue Program (Smart Guide-i)

This software offers the maximum user convenience through dialogue manipulation from setup to processing. This includes writing processing programs and simulation checks.

### 2. LAUNCHER

This software offers shortcuts for quick access to specialized features and frequently used features.

# SPECIFICATIONS

## Standard & Optional

| Spindle                                            |                                | HD2600 | HD2600L | HD2600M | HD2600LM |
|----------------------------------------------------|--------------------------------|--------|---------|---------|----------|
| 12" Headstock                                      |                                | ○      | ○       | -       | -        |
| Main Spindle                                       | 10"                            | ●      | ●       | ●       | ●        |
| Hollow Chuck 3 Jaw                                 | 12"                            | ○      | ○       | ○       | ○        |
| Main Spindle                                       | 10"                            | ○      | ○       | ○       | ○        |
| Solid Chuck 3 Jaw                                  | 12"                            | -      | -       | -       | -        |
| Belt Type                                          |                                | ●      | ●       | ●       | ●        |
| Gear Type                                          |                                | -      | -       | -       | -        |
| Standard Soft Jaw (1 set)                          |                                | ●      | ●       | ●       | ●        |
| Chuck Clamp Foot Switch                            |                                | ●      | ●       | ●       | ●        |
| 2 Steps Hyd, Pressure Device                       |                                | ○      | ○       | ○       | ○        |
| Spindle Inside Stopper                             |                                | ☆      | ☆       | ☆       | ☆        |
| 5" Index                                           |                                | -      | -       | -       | -        |
| Cs-Axis (0.001")                                   |                                | -      | -       | ●       | ●        |
| Chuck Open/Close Confirmation Device               |                                | ●      | ●       | ●       | ●        |
| 2 Steps Chuck Foot Switch                          |                                | ○      | ○       | ○       | ○        |
| <b>Turret</b>                                      |                                |        |         |         |          |
| Tool Holder                                        |                                | ●      | ●       | ●       | ●        |
| Mill Turret                                        | BMT                            | -      | -       | ●       | ●        |
| Straight Milling Head                              | Collet Type, 2ea               | -      | -       | ●       | ●        |
| Angular Milling Head                               | Collet Type, 2ea               | -      | -       | ●       | ●        |
| Straight Milling Head                              | Adapter Type                   | -      | -       | -       | -        |
| Angular Milling Head                               | Adapter Type                   | -      | -       | -       | -        |
| Boring Sleeve                                      |                                | ●      | ●       | ●       | ●        |
| Drill Socket                                       |                                | ○      | ○       | ○       | ○        |
| U-Drill Holder                                     |                                | ●      | ●       | ●       | ●        |
| O.D Extension Holder                               | For Out-Dia                    | ●      | ●       | -       | -        |
| Angle Head                                         |                                | -      | -       | -       | -        |
| <b>Tail Stock &amp; Steady Rest</b>                |                                |        |         |         |          |
| Quill Type Tail Stock                              | MT#4                           | -      | -       | -       | -        |
|                                                    | MT#5                           | ●      | ●       | ●       | ●        |
| Built-in Tail Stock                                | MT#4                           | ○      | ○       | ○       | ○        |
| Programmable Tail Stock                            |                                | ○      | ○       | ○       | ○        |
| Manual Type Hyd. Steady Rest                       |                                | -      | -       | -       | -        |
| Standard Live Center                               |                                | ●      | ●       | ●       | ●        |
| High Precision Live Center                         |                                | ☆      | ☆       | ☆       | ☆        |
| 2 Steps Tail Stock Pressure System                 |                                | ○      | ○       | ○       | ○        |
| Quill Forward/Reverse Confirmation Device          |                                | ○      | ○       | ○       | ○        |
| Tail Stock Foot Switch                             |                                | ○      | ○       | ○       | ○        |
| <b>Coolant &amp; Air Blow</b>                      |                                |        |         |         |          |
| Standard Coolant (Nozzle)                          |                                | ●      | ●       | ●       | ●        |
| Chuck Coolant (Upper Chuck)                        |                                | ○      | ○       | ○       | ○        |
| Gun Coolant                                        |                                | ○      | ○       | ○       | ○        |
| Through Spindle Coolant (Only for Special Chuck)   |                                | ☆      | ☆       | ☆       | ☆        |
| Thru Coolant for Live Tool                         |                                | -      | -       | ☆       | ☆        |
| Chuck Air Blow (Upper Chuck)                       |                                | ○      | ○       | ○       | ○        |
| Tail Stock Air Blow (Upper Tail Stock)             |                                | ○      | ○       | ○       | ○        |
| Turret Air Blow                                    |                                | ☆      | ☆       | ☆       | ☆        |
| Air Gun                                            |                                | ○      | ○       | ○       | ○        |
| Through Spindle Air Blow (Only for Special Chuck)  |                                | ☆      | ☆       | ☆       | ☆        |
| High Pressure Coolant                              | 0.5Bar                         | ●      | ●       | ●       | ●        |
|                                                    | 6Bar                           | ○      | ○       | ○       | ○        |
|                                                    | 20Bar                          | ○      | ○       | ○       | ○        |
| Power Coolant System (For Automation)              |                                | ☆      | ☆       | ☆       | ☆        |
| Coolant Chiller (Only for Sub Tank, Chip Conveyor) |                                | -      | -       | -       | -        |
| <b>Chip Disposal</b>                               |                                |        |         |         |          |
| Coolant Tank                                       | Side                           | ●      | ●       | ●       | ●        |
|                                                    | Rear                           | ○      | -       | ○       | -        |
| Chip Conveyor (Hinge/Scraper)                      | Front (Right)                  | ○      | ○       | ○       | ○        |
|                                                    | Rear (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                     | ☆      | ☆       | ☆       | ☆        |

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

| Safety Device                                               |                                                                                                | HD2600 | HD2600L | HD2600M | HD2600LM |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------|---------|---------|----------|
| Total Splash Guard                                          |                                                                                                | ●      | ●       | ●       | ●        |
| <b>Electric Device</b>                                      |                                                                                                |        |         |         |          |
| Call Light                                                  | 1Color :    | ●      | ●       | ●       | ●        |
| Call Light & Buzzer                                         | 3Color :  B | ○      | ○       | ○       | ○        |
| Electric Cabinet Light                                      |                                                                                                | ○      | ○       | ○       | ○        |
| Remote MPG                                                  |                                                                                                | ○      | ○       | ○       | ○        |
| Work Counter                                                | Digital                                                                                        | ○      | ○       | ○       | ○        |
| Total Counter                                               | Digital                                                                                        | ○      | ○       | ○       | ○        |
| Tool Counter                                                | Digital                                                                                        | ○      | ○       | ○       | ○        |
| Multi Tool Counter                                          | Digital                                                                                        | ○      | ○       | ○       | ○        |
| Electric Circuit Breaker                                    | FANUC                                                                                          | ○      | ○       | ○       | ○        |
|                                                             | SIEMENS                                                                                        | -      | -       | -       | -        |
| AVR (Auto Voltage Regulator)                                |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Transformer                                                 | 30kVA                                                                                          | ○      | ○       | ○       | ○        |
| Auto Power Off                                              |                                                                                                | ○      | ○       | ○       | ○        |
| <b>Measurement</b>                                          |                                                                                                |        |         |         |          |
| Manual Q-Setter                                             |                                                                                                | ○      | ○       | ○       | ○        |
| Manual Q-Setter (Renishaw)                                  |                                                                                                | ○      | ○       | ○       | ○        |
| Automatic Q-Setter (Renishaw)                               |                                                                                                | ○      | ○       | ○       | ○        |
| Work Close Confirmation Device (Only for Special Chuck)     | TACO                                                                                           | ☆      | ☆       | ☆       | ☆        |
|                                                             | SMC                                                                                            | ☆      | ☆       | ☆       | ☆        |
| Auto Tool Measuring Device                                  |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Linear Scale                                                | X Axis                                                                                         | ○      | ○       | ○       | ○        |
|                                                             | Z Axis                                                                                         | ○      | ○       | ○       | ○        |
| Coolant Level Sensor (Only for Chip Conveyor, bladder Type) |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| <b>Environment</b>                                          |                                                                                                |        |         |         |          |
| Air Conditioner                                             |                                                                                                | ○      | ○       | ○       | ○        |
| Oil Mist Collector                                          |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Oil Skimmer (Only for Chip Conveyor)                        |                                                                                                | ○      | ○       | ○       | ○        |
| MQL (Minimal Quantity Lubrication)                          |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| <b>Fixture &amp; Automation</b>                             |                                                                                                |        |         |         |          |
| Auto Door                                                   |                                                                                                | ○      | ○       | ○       | ○        |
| Auto Shutter (Only for Automatic System)                    |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Sub Operation Pannel                                        |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Bar Feeder Interface                                        |                                                                                                | ○      | ○       | ○       | ○        |
| Bar Feeder                                                  |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| workpusher (Spring type)                                    |                                                                                                | ○      | ○       | ○       | ○        |
| Extra M-Code 4ea                                            |                                                                                                | ○      | ○       | ○       | ○        |
| Automation Interface                                        |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| I/O Extension (IN & OUT)                                    | 16 Contact                                                                                     | ○      | ○       | ○       | ○        |
|                                                             | 32 Contact                                                                                     | ○      | ○       | ○       | ○        |
| Parts Catcher                                               |                                                                                                | ○      | ○       | ○       | ○        |
| Turret Work Pusher (For Automation)                         |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Parts Conveyor (Required Main Parts Catcher)                |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Semi Automation System                                      |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| <b>Hyd. Device</b>                                          |                                                                                                |        |         |         |          |
| Standard Hyd. Cylinder                                      | Hollow                                                                                         | ●      | ●       | ●       | ●        |
|                                                             | 35bar/24 ℓ (6.3gal)                                                                            | ●      | ●       | ●       | ●        |
| Standard Hyd. Unit                                          |                                                                                                | ○      | ○       | ○       | ○        |
| <b>S/W</b>                                                  |                                                                                                |        |         |         |          |
| Dialogue Program (HW-DPRO)                                  |                                                                                                | ○      | ○       | ○       | ○        |
| DNC software (HW-eDNC)                                      |                                                                                                | ○      | ○       | ○       | ○        |
| Smart Guide-1 : FANUC                                       |                                                                                                | ●      | ●       | ●       | ●        |
| Smart S/W                                                   |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| <b>ETC</b>                                                  |                                                                                                |        |         |         |          |
| Tool Box                                                    |                                                                                                | ●      | ●       | ●       | ●        |
| Customized Color                                            | Need Munsel No.                                                                                | ☆      | ☆       | ☆       | ☆        |
| CAD & CAM                                                   |                                                                                                | ☆      | ☆       | ☆       | ☆        |
| Thermal displacement compensation                           |                                                                                                | ○      | ○       | ○       | ○        |

※ 4 channel of TDC(Thermal Displacement Compensation) device is recommended, when more than 6 bar of high pressure coolant is applied, for the high quality machining.  
Specifications are subject to change without notice for improvement.

# SPECIFICATIONS

## Standard & Optional

| Spindle                                            |                                | HD3100A | HD3100MA |
|----------------------------------------------------|--------------------------------|---------|----------|
| Main Spindle                                       | 10"                            | ●       | ●        |
| Hollow Chuck 3 Jaw                                 | 12"                            | ○       | ○        |
| Main Spindle                                       | 10"                            | ○       | ○        |
| Solid Chuck 3 Jaw                                  | 12"                            | -       | -        |
| Belt Type                                          |                                | ●       | ●        |
| Gear Type                                          |                                | -       | -        |
| Standard Soft Jaw (1set)                           |                                | ●       | ●        |
| Chuck Clamp Foot Switch                            |                                | ●       | ●        |
| 2 Steps Hyd. Pressure Device                       |                                | ○       | ○        |
| Spindle Inside Stopper                             |                                | ☆       | ☆        |
| 5" Index                                           |                                | -       | -        |
| Cs-Axis (0.001")                                   |                                | -       | ●        |
| Chuck Open/Close Confirmation Device               |                                | ●       | ●        |
| 2 Steps Chuck Foot Switch                          |                                | ○       | ○        |
| <b>Turret</b>                                      |                                |         |          |
| Tool Holder                                        |                                | ●       | ●        |
| Mill Turret                                        | BMT                            | -       | ●        |
| Straight Milling Head                              | Collet Type,2ea                | -       | ●        |
| Angular Milling Head                               | Collet Type,2ea                | -       | ●        |
| Straight Milling Head                              | Adapter Type                   | -       | -        |
| Angular Milling Head                               | Adapter Type                   | -       | -        |
| Boring Sleeve                                      |                                | ●       | ●        |
| Drill Socket                                       |                                | ○       | ○        |
| U-Drill Holder                                     |                                | ●       | ●        |
| O.D Extension Holder                               | For Out-Dia                    | ●       | -        |
| Angle Head                                         |                                | -       | -        |
| <b>Tail Stock &amp; Steady Rest</b>                |                                |         |          |
| Quill Type Tail Stock                              | MT#4                           | -       | -        |
|                                                    | MT#5                           | ●       | ●        |
| Built-in Tail Stock                                | MT#4                           | ○       | ○        |
| Programmable Tail Stock                            |                                | ○       | ○        |
| Manual Type Hyd. Steady Rest                       |                                | -       | -        |
| Standard Live Center                               |                                | ●       | ●        |
| High Precision Live Center                         |                                | ☆       | ☆        |
| 2 Steps Tail Stock Pressure System                 |                                | ○       | ○        |
| Quill Forward/Reverse Confirmation Device          |                                | ○       | ○        |
| Tail Stock Foot Switch                             |                                | ○       | ○        |
| <b>Coolant &amp; Air Blow</b>                      |                                |         |          |
| Standard Coolant (Nozzle)                          |                                | ●       | ●        |
| Chuck Coolant (Upper Chuck)                        |                                | ○       | ○        |
| Gun Coolant                                        |                                | ○       | ○        |
| Through Spindle Coolant (Only for Special Chuck)   |                                | ☆       | ☆        |
| Thru Coolant for Live Tool                         |                                | -       | ☆        |
| Chuck Air Blow (Upper Chuck)                       |                                | ○       | ○        |
| Tail Stock Air Blow (Upper Tail Stock)             |                                | ○       | ○        |
| Turret Air Blow                                    |                                | ☆       | ☆        |
| Air Gun                                            |                                | ○       | ○        |
| Through Spindle Air Blow (Only for Special Chuck)  |                                | ☆       | ☆        |
| High Pressure Coolant                              | 0.5Bar                         | ●       | ●        |
|                                                    | 6Bar                           | ○       | ○        |
|                                                    | 20Bar                          | ○       | ○        |
| Power Coolant System (For Automation)              |                                | ☆       | ☆        |
| Coolant Chiller (Only for Sub Tank, Chip Conveyor) |                                | -       | -        |
| <b>Chip Disposal</b>                               |                                |         |          |
| Coolant Tank                                       | Side                           | ●       | ●        |
|                                                    | Rear                           | ○       | ○        |
| Chip Conveyor (Hinge/Scraper)                      | Front (Right)                  | ○       | ○        |
|                                                    | Rear (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                     | ☆       | ☆        |

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

| Safety Device                                               |                     | HD3100A | HD3100MA |
|-------------------------------------------------------------|---------------------|---------|----------|
| Total Splash Guard                                          |                     | ●       | ●        |
| <b>Electric Device</b>                                      |                     |         |          |
| Call Light                                                  | 1Color : ●          | ●       | ●        |
| Call Light & Buzzer                                         | 3Color : ●●●        | ○       | ○        |
| Electric Cabinet Light                                      |                     | ○       | ○        |
| Remote MPG                                                  |                     | ○       | ○        |
| Work Counter                                                | Digital             | ○       | ○        |
| Total Counter                                               | Digital             | ○       | ○        |
| Tool Counter                                                | Digital             | ○       | ○        |
| Multi Tool Counter                                          | Digital             | ○       | ○        |
| Electric Circuit Breaker                                    |                     | ○       | ○        |
| AVR (Auto Voltage Regulator)                                |                     | ☆       | ☆        |
| Transformer                                                 | 30KVA               | ○       | ○        |
| Auto Power Off                                              |                     | ○       | ○        |
| <b>Measurement</b>                                          |                     |         |          |
| Manual Q-Setter                                             |                     | ○       | ○        |
| Manual Q-Setter (Renishaw)                                  |                     | ○       | ○        |
| Automatic Q-Setter (Renishaw)                               |                     | ○       | ○        |
| Work Close Confirmation Device (Only for Special Chuck)     | TACO                | ☆       | ☆        |
|                                                             | SMC                 | ☆       | ☆        |
| Auto Tool Measuring Device                                  |                     | ☆       | ☆        |
| Linear Scale                                                | X Axis              | ○       | ○        |
|                                                             | Z Axis              | ○       | ○        |
| Coolant Level Sensor (Only for Chip Conveyor, bladder Type) |                     | ☆       | ☆        |
| <b>Environment</b>                                          |                     |         |          |
| Air Conditioner                                             |                     | ○       | ○        |
| Oil Mist Collector                                          |                     | ☆       | ☆        |
| Oil Skimmer (Only for Chip Conveyor)                        |                     | ○       | ○        |
| MQL (Minimal Quantity Lubrication)                          |                     | ☆       | ☆        |
| <b>Fixture &amp; Automation</b>                             |                     |         |          |
| Auto Door                                                   |                     | ○       | ○        |
| Auto Shutter (Only for Automatic System)                    |                     | ☆       | ☆        |
| Sub Operation Pannel                                        |                     | ☆       | ☆        |
| Bar Feeder Interface                                        |                     | ○       | ○        |
| Bar Feeder                                                  |                     | ☆       | ☆        |
| workpusher (Spring type)                                    |                     | ○       | ○        |
| Extra M-Code 4ea                                            |                     | ○       | ○        |
| Automation Interface                                        |                     | ☆       | ☆        |
| I/O Extension (IN & OUT)                                    | 16 Contact          | ○       | ○        |
|                                                             | 32 Contact          | ○       | ○        |
| Parts Catcher                                               | Main SP.            | ○       | ○        |
| Turret Work Pusher (For Automation)                         |                     | ☆       | ☆        |
| Parts Conveyor (Required Main Parts Catcher)                |                     | ☆       | ☆        |
| Semi Automation System                                      |                     | ☆       | ☆        |
| <b>Hyd. Device</b>                                          |                     |         |          |
| Standard Hyd. Cylinder                                      | Hollow              | ●       | ●        |
| Standard Hyd. Unit                                          | 35bar/30 ℓ (7.9gal) | ●       | ●        |
| <b>S/W</b>                                                  |                     |         |          |
| Dialogue Program (HW-DPRQ)                                  |                     | ○       | ○        |
| DNC software (HW-eDNC)                                      |                     | ○       | ○        |
| Smart Guide-i : FANUC                                       |                     | ●       | ●        |
| Smart S/W                                                   |                     | ☆       | ☆        |
| <b>ETC</b>                                                  |                     |         |          |
| Tool Box                                                    |                     | ●       | ●        |
| Customized Color                                            | Need Munsel No.     | ☆       | ☆        |
| CAD & CAM                                                   |                     | ☆       | ☆        |
| Thermal displacement compensation                           |                     | ○       | ○        |

※ 4 channel of TDC(Thermal Displacement Compensation) device is recommended, when more than 6 bar of high pressure coolant is applied, for the high quality machining.  
Specifications are subject to change without notice for improvement.

# SPECIFICATIONS

## Standard & Optional

| Spindle                                            |                                | HD3100/L | HD3100M/LM |
|----------------------------------------------------|--------------------------------|----------|------------|
| Main Spindle                                       | 12"                            | ●        | ●          |
| Hollow Chuck 3 Jaw                                 | 15"                            | -        | -          |
| Main Spindle                                       | 12"                            | -        | -          |
| Solid Chuck 3 Jaw                                  | 15"                            | -        | -          |
| Belt Type                                          |                                | ●        | ●          |
| Gear Type                                          |                                | ○        | -          |
| Standard Soft Jaw (1set)                           |                                | ●        | ●          |
| Chuck Clamp Foot Switch                            |                                | ●        | ●          |
| 2 Steps Hyd. Pressure Device                       |                                | ○        | ○          |
| Spindle Inside Stopper                             |                                | ☆        | ☆          |
| 5" Index                                           |                                | ☆        | ☆          |
| Cs-Axis (0.001")                                   |                                | -        | ●          |
| Chuck Open/Close Confirmation Device               |                                | ●        | ●          |
| 2 Steps Chuck Foot Switch                          |                                | ○        | ○          |
| Turret                                             |                                |          |            |
| Tool Holder                                        |                                | ●        | ●          |
| Mill Turret                                        | BMT                            | -        | ●          |
| Straight Milling Head                              | Collet Type,2ea                | -        | ●          |
| Angular Milling Head                               | Collet Type,2ea                | -        | ●          |
| Straight Milling Head                              | Adapter Type                   | -        | -          |
| Angular Milling Head                               | Adapter Type                   | -        | -          |
| Boring Sleeve                                      |                                | ●        | ●          |
| Drill Socket                                       |                                | ○        | ○          |
| U-Drill Holder                                     |                                | ●        | ●          |
| O.D Extension Holder                               | For Out-Dia                    | ●        | -          |
| Angle Head                                         |                                | -        | -          |
| Tail Stock & Steady Rest                           |                                |          |            |
| Quill Type Tail Stock                              | MT#4                           | -        | -          |
|                                                    | MT#5                           | ●        | ●          |
| Built-in Tail Stock                                | MT#4                           | ○        | ○          |
| Programmable Tail Stock                            |                                | ○        | ○          |
| Manual Type Hyd. Steady Rest                       |                                | -        | -          |
| Standard Live Center                               |                                | ●        | ●          |
| High Precesion Live Center                         |                                | ☆        | ☆          |
| 2 Steps Tail Stock Pressure System                 |                                | ○        | ○          |
| Quill Forward/Reverse Confirmation Device          |                                | ○        | ○          |
| Tail Stock Foot Switch                             |                                | ○        | ○          |
| Coolant & Air Blow                                 |                                |          |            |
| Standard Coolant (Nozzle)                          |                                | ●        | ●          |
| Chuck Coolant (Upper Chuck)                        |                                | ○        | ○          |
| Gun Coolant                                        |                                | ○        | ○          |
| Through Spindle Coolant (Only for Special Chuck)   |                                | ☆        | ☆          |
| Thru Coolant for Live Tool                         |                                | -        | ☆          |
| Chuck Air Blow (Upper Chuck)                       |                                | ○        | ○          |
| Tail Stock Air Blow (Upper Tail Stock)             |                                | ○        | ○          |
| Turret Air Blow                                    |                                | ☆        | ☆          |
| Air Gun                                            |                                | ○        | ○          |
| Through Spindle Air Blow (Only for Special Chuck)  |                                | ☆        | ☆          |
| High Pressure Coolant                              | 0.5Bar                         | ●        | ●          |
|                                                    | 6Bar                           | ○        | ○          |
|                                                    | 20Bar                          | ○        | ○          |
| Power Coolant System (For Automation)              |                                | ☆        | ☆          |
| Coolant Chiller (Only for Sub Tank, Chip Conveyor) |                                | -        | -          |
| Chip Disposal                                      |                                |          |            |
| Coolant Tank                                       | Side                           | ●        | ●          |
|                                                    | Rear                           | ○/-      | ○/-        |
| Chip Conveyor (Hinge/Scraper)                      | Front (Right)                  | ○        | ○          |
|                                                    | Rear (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                     | ☆        | ☆          |

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

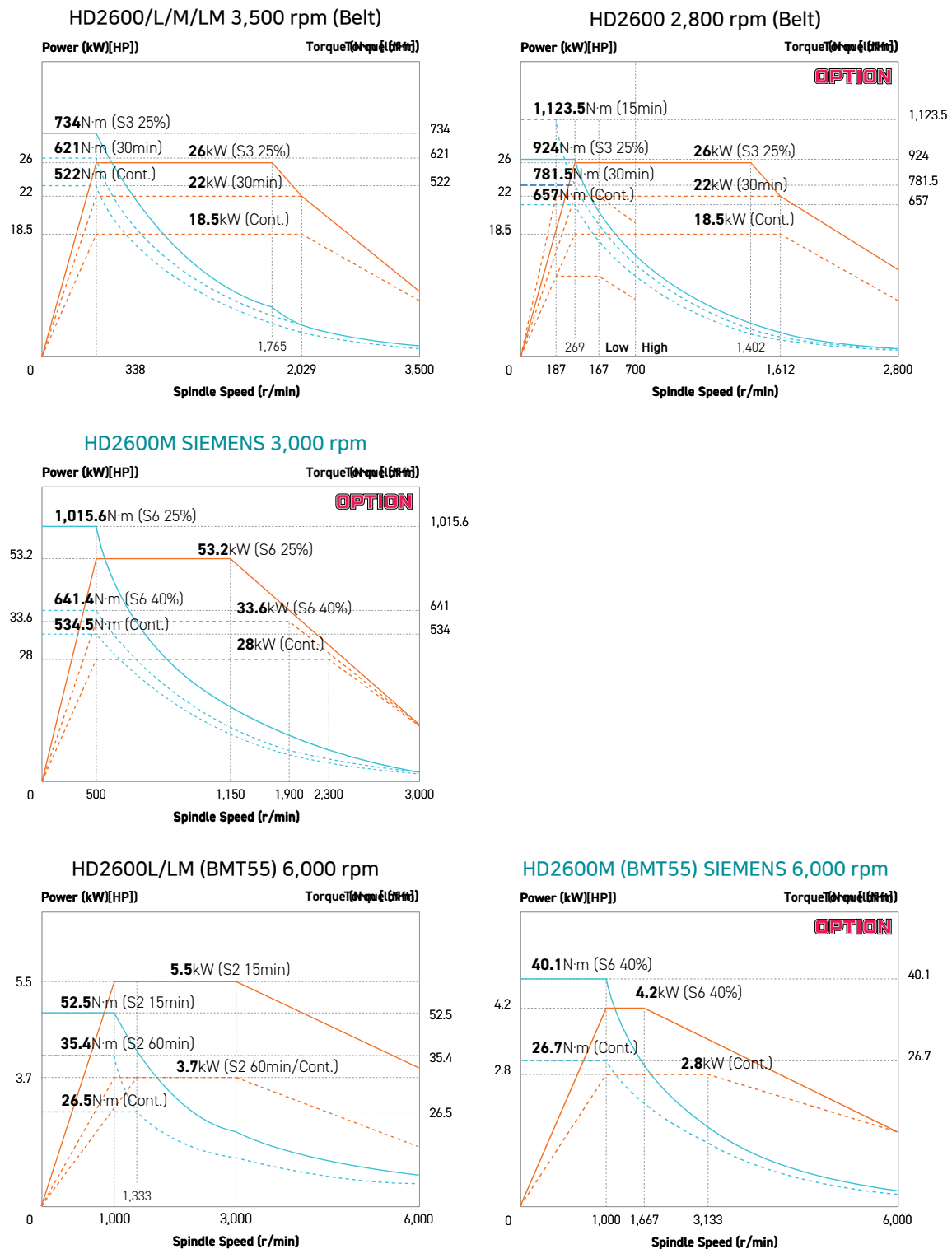
| Safety Device                                               |                                                                                              | HD3100/L | HD3100M/LM |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------|------------|
| Total Splash Guard                                          |                                                                                              | ●        | ●          |
| Electric Device                                             |                                                                                              |          |            |
| Call Light                                                  | 1Color :  | ●        | ●          |
| Call Light & Buzzer                                         | 3Color :  | ○        | ○          |
| Electric Cabinet Light                                      |                                                                                              | ○        | ○          |
| Remote MPG                                                  |                                                                                              | ○        | ○          |
| Work Counter                                                | Digital                                                                                      | ○        | ○          |
| Total Counter                                               | Digital                                                                                      | ○        | ○          |
| Tool Counter                                                | Digital                                                                                      | ○        | ○          |
| Multi Tool Counter                                          | Digital                                                                                      | ○        | ○          |
| Electric Circuit Breaker                                    |                                                                                              | ○        | ○          |
| AVR (Auto Voltage Regulator)                                |                                                                                              | ☆        | ☆          |
| Transformer                                                 | 30kVA (Belt)                                                                                 | ○        | ○          |
|                                                             | 35kVA (Gear)                                                                                 | ○        | ○          |
| Auto Power Off                                              |                                                                                              | ○        | ○          |
| Measurement                                                 |                                                                                              |          |            |
| Manual Q-Setter                                             |                                                                                              | ○        | ○          |
| Manual Q-Setter (Renishaw)                                  |                                                                                              | ○        | ○          |
| Automatic Q-Setter (Renishaw)                               |                                                                                              | ○        | ○          |
| Work Close Confirmation Device (Only for Special Chuck)     | TACO                                                                                         | ☆        | ☆          |
|                                                             | SMC                                                                                          | ☆        | ☆          |
| Auto Tool Measuring Device                                  |                                                                                              | ☆        | ☆          |
| Linear Scale                                                | X Axis                                                                                       | ○        | ○          |
|                                                             | Z Axis                                                                                       | ○        | ○          |
| Coolant Level Sensor (Only for Chip Conveyor, bladder Type) |                                                                                              | ☆        | ☆          |
| Environment                                                 |                                                                                              |          |            |
| Air Conditioner                                             |                                                                                              | ○        | ○          |
| Oil Mist Collector                                          |                                                                                              | ☆        | ☆          |
| Oil Skimmer (Only for Chip Conveyor)                        |                                                                                              | ○        | ○          |
| MQL (Minimal Quantity Lubrication)                          |                                                                                              | ☆        | ☆          |
| Fixture & Automation                                        |                                                                                              |          |            |
| Auto Door                                                   |                                                                                              | ○        | ○          |
| Auto Shutter (Only for Automatic System)                    |                                                                                              | ☆        | ☆          |
| Sub Operation Pannel                                        |                                                                                              | ☆        | ☆          |
| Bar Feeder Interface                                        |                                                                                              | ○        | ○          |
| Bar Feeder                                                  |                                                                                              | ☆        | ☆          |
| workpusher (Spring type)                                    |                                                                                              | ○        | ○          |
| Extra M-Code 4ea                                            |                                                                                              | ○        | ○          |
| Automation Interface                                        |                                                                                              | ☆        | ☆          |
| I/O Extension (IN & OUT)                                    | 16 Contact                                                                                   | ○        | ○          |
|                                                             | 32 Contact                                                                                   | ○        | ○          |
| Parts Catcher                                               | Main SP.                                                                                     | ○        | ○          |
| Turret Work Pusher (For Automation)                         |                                                                                              | ☆        | ☆          |
| Parts Conveyor (Required Main Parts Catcher)                |                                                                                              | ☆        | ☆          |
| Semi Automation System                                      |                                                                                              | ☆        | ☆          |
| Hyd. Device                                                 |                                                                                              |          |            |
| Standard Hyd. Cylinder                                      | Hollow                                                                                       | ●        | ●          |
| Standard Hyd. Unit                                          | 35bar/30 ℓ (7.9gal)                                                                          | ●        | ●          |
| S/W                                                         |                                                                                              |          |            |
| Dialogue Program (HW-DPRO)                                  |                                                                                              | ○        | ○          |
| DNC software (HW-eDNC)                                      |                                                                                              | ○        | ○          |
| Smart Guide-1: FANUC                                        |                                                                                              | ●        | ●          |
| Smart S/W                                                   |                                                                                              | ☆        | ☆          |
| ETC                                                         |                                                                                              |          |            |
| Tool Box                                                    |                                                                                              | ●        | ●          |
| Customized Color                                            | Need Munsel No.                                                                              | ☆        | ☆          |
| CAD & CAM                                                   |                                                                                              | ☆        | ☆          |
| Thermal displacement compensation                           |                                                                                              | ○        | ○          |

※ 4 channel of TDC(Thermal Displacement Compensation) device is recommended, when more than 6 bar of high pressure coolant is applied, for the high quality machining.  
Specifications are subject to change without notice for improvement.



# SPECIFICATIONS

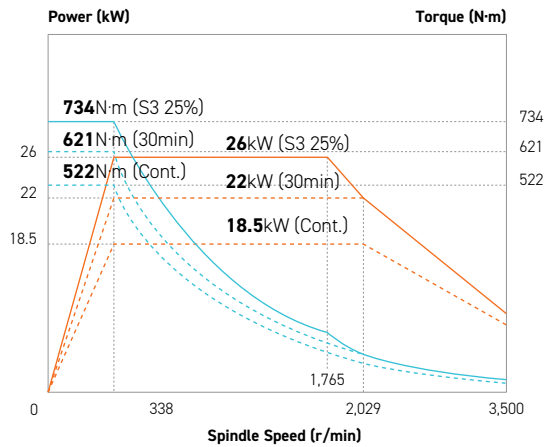
## Spindle-Turret Output/Torque Diagram (HD2600 Series)



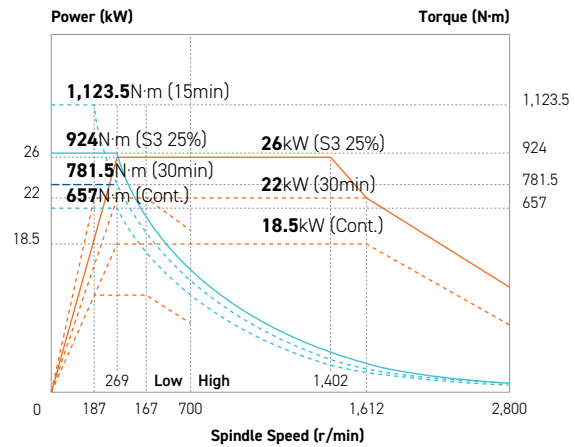
# SPECIFICATIONS

## Spindle·Turret Output/Torque Diagram (HD3100 Series)

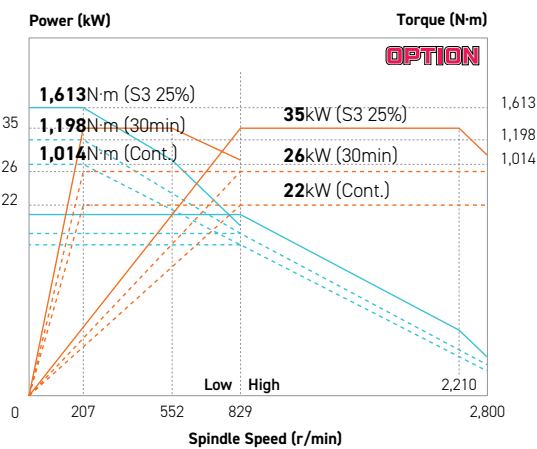
HD3100A/MA 3,500 rpm (Belt)



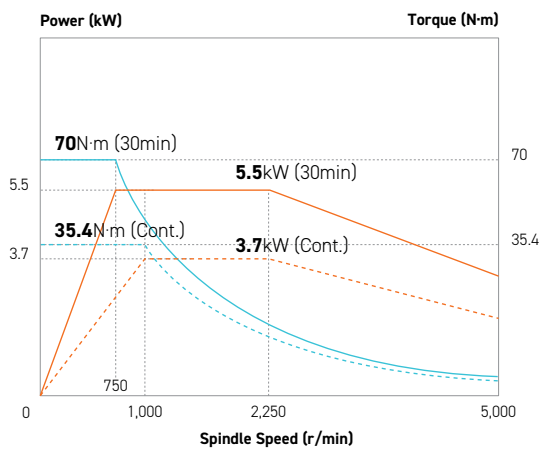
HD3100/M | HD3100L/LM 2,800 rpm (Belt)



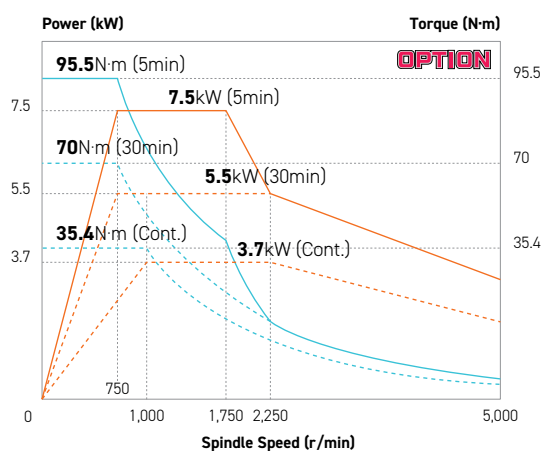
HD3100/L 2,800 rpm (Gear)



HD3100 Series (BMT65) 5,000 rpm



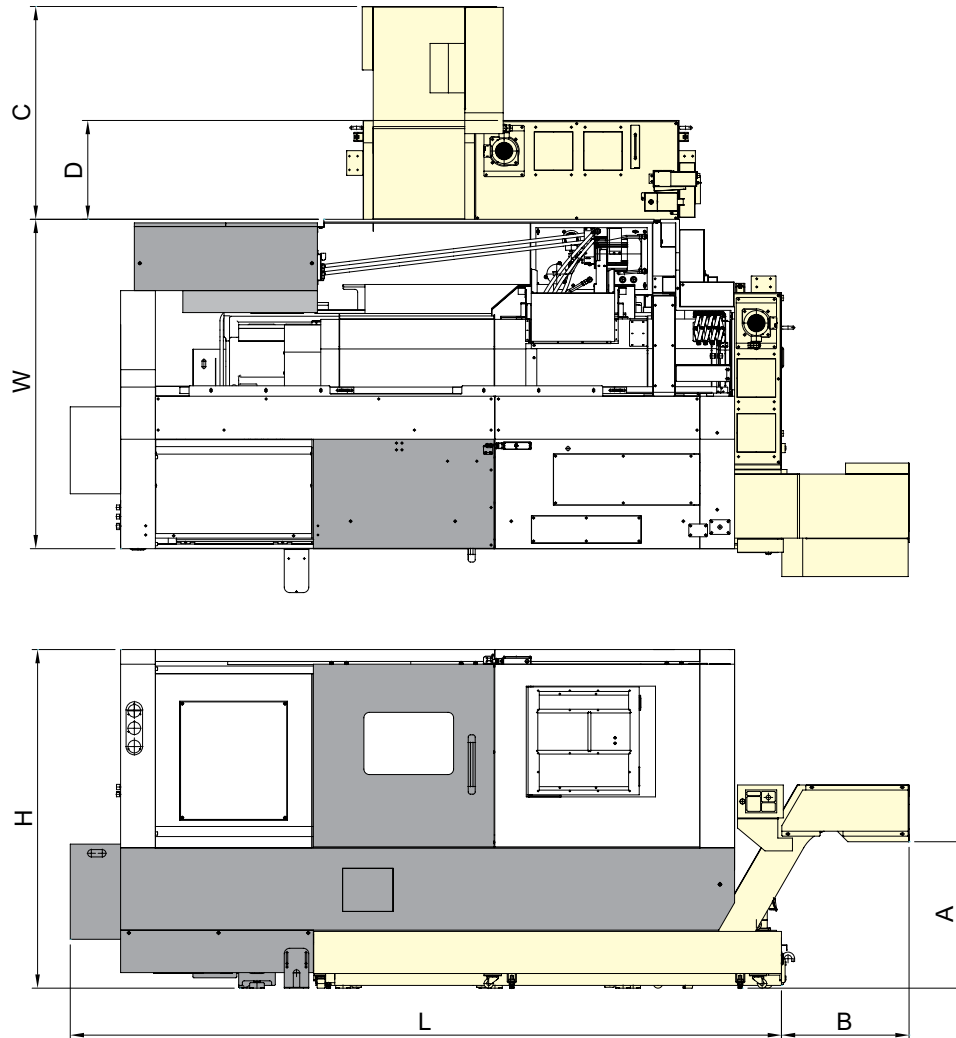
HD3100 Series (BMT65) 5,000 rpm



# SPECIFICATIONS

## External Dimensions

unit : mm(in)

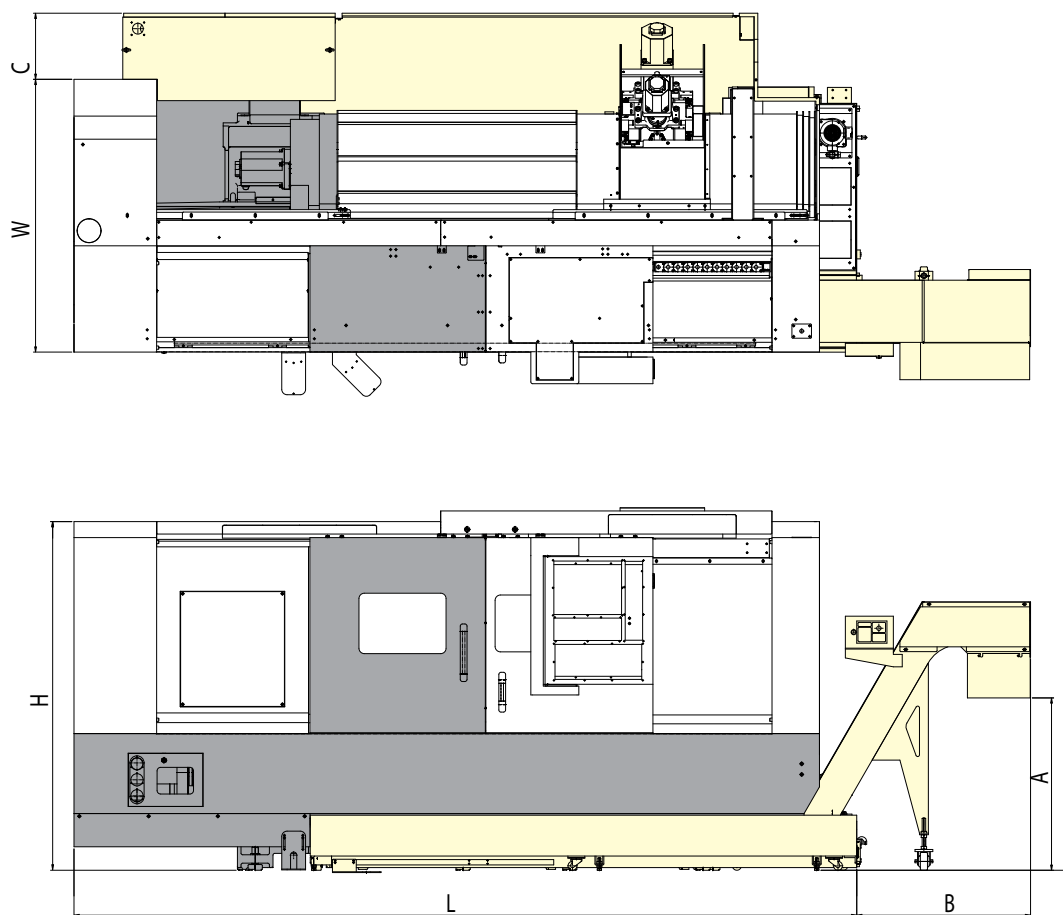


| Dimension                  |   | HD2600              | HD2600M | HD3100A       | HD3100MA | HD3100         | HD3100M |
|----------------------------|---|---------------------|---------|---------------|----------|----------------|---------|
| Length                     | L | 3,400 (133.9")      |         | 3,885 (153")  |          |                |         |
| Length (Gear Spindle Opt.) |   | -                   |         | -             |          | 4,045 (159.2") | -       |
| Width                      | W | 1,708 (67.2")       |         | 1,800 (70.9") |          |                |         |
| Height                     | H | 1,755 (69.1")       |         | 1,850 (72.8") |          |                |         |
| Conveyor height            | A | 1,200 or 850 (Opt.) |         |               |          |                |         |
| Side type chip conveyor    | B | 1,120 (44.1")       |         | 900 (35.4")   |          |                |         |
| Rear type chip conveyor    | C | 1,210 (47.6")       |         | 1,120 (44.1") |          |                |         |
| Rear tank                  | D | 630 (24.8")         |         | 540 (21.3")   |          |                |         |

# SPECIFICATIONS

## External Dimensions

unit : mm



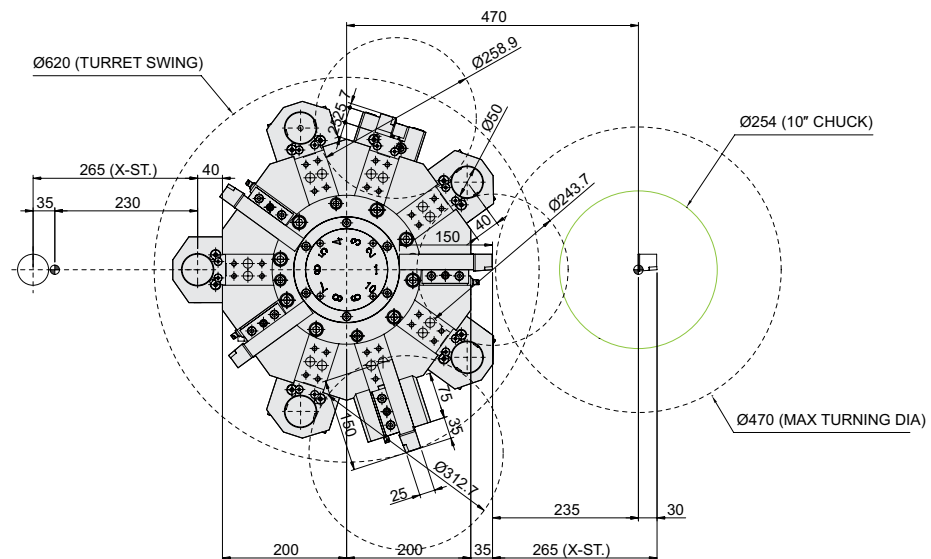
| Dimension                  |   | HD2600L              | HD2600LM | HD3100L              | HD3100LM |
|----------------------------|---|----------------------|----------|----------------------|----------|
| Length                     | L | 4,404 (173.3")       |          | 4,404 (173.3")       |          |
| Length (Gear Spindle Opt.) |   | 4,045 (159.2")       | -        | 4,045 (159.2")       | -        |
| Width                      | W | 1,535 (60.4")        |          | 1,978 (60.4")        |          |
| Height                     | H | 1,755 (69")          |          | 1,755 (69")          |          |
| Conveyor height            | A | 969.8 (38.1") [Opt.] |          | 969.8 (38.1") [Opt.] |          |
| Side type chip conveyor    | B | 978 (38.5")          |          | 978 (38.5")          |          |
| Rear tank                  | C | 372 (14.6")          |          | 372 (14.6")          |          |

# SPECIFICATIONS

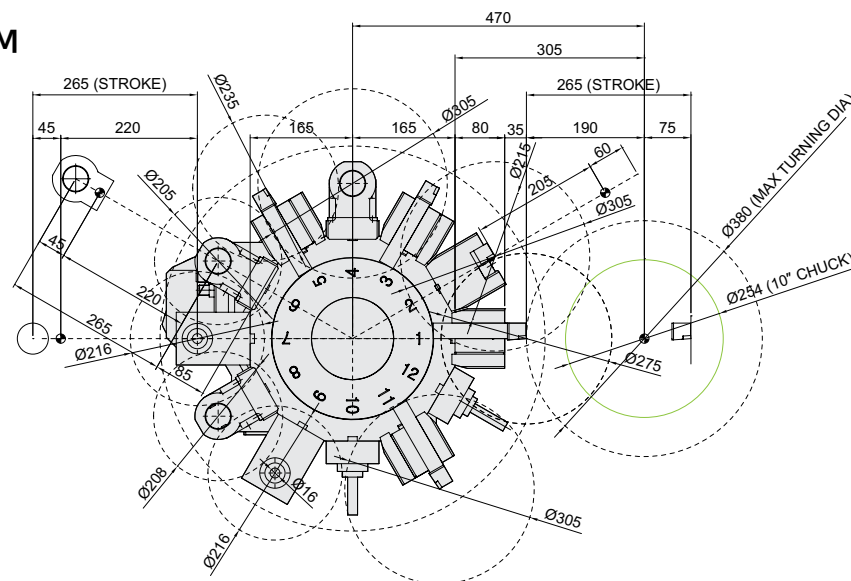
## Interference

unit : mm

### (10 Station) HD2600/L



### HD2600M/LM



If the tool is positioned differently than the above tooling drawings, the application of the OD Extension holder may interfere with the chuck.

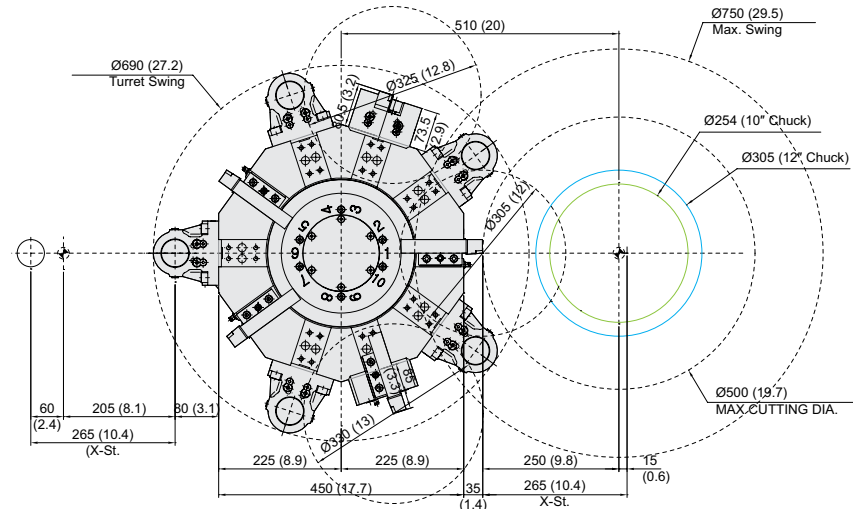


# SPECIFICATIONS

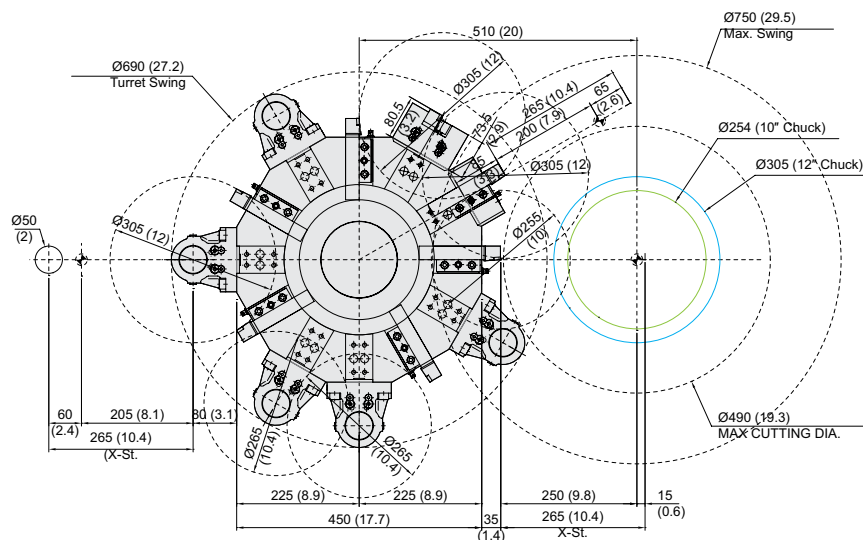
## Interference

unit : mm(in)

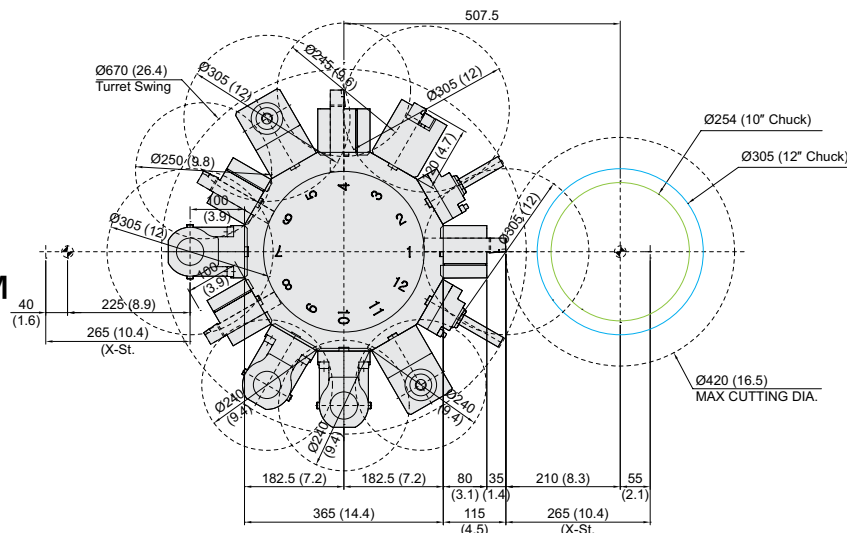
### (10 Station) HD3100A HD3100/L



### (12 Station) HD3100A HD3100/L



### HD3100MA HD3100M/LM



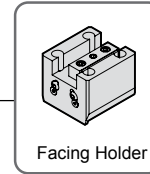
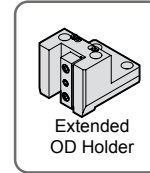
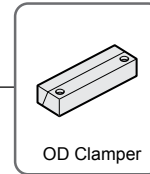
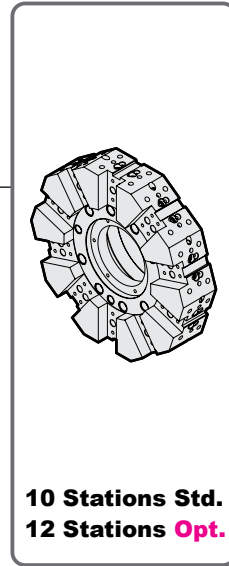
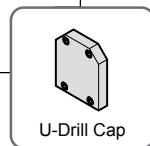
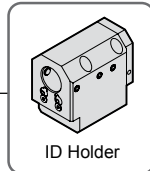
If the tool is positioned differently than the above tooling drawings, the application of the OD Extension holder may interfere with the chuck.

# SPECIFICATIONS

## Tooling System

unit : mm(in)

  Option



## Tooling Parts Detail

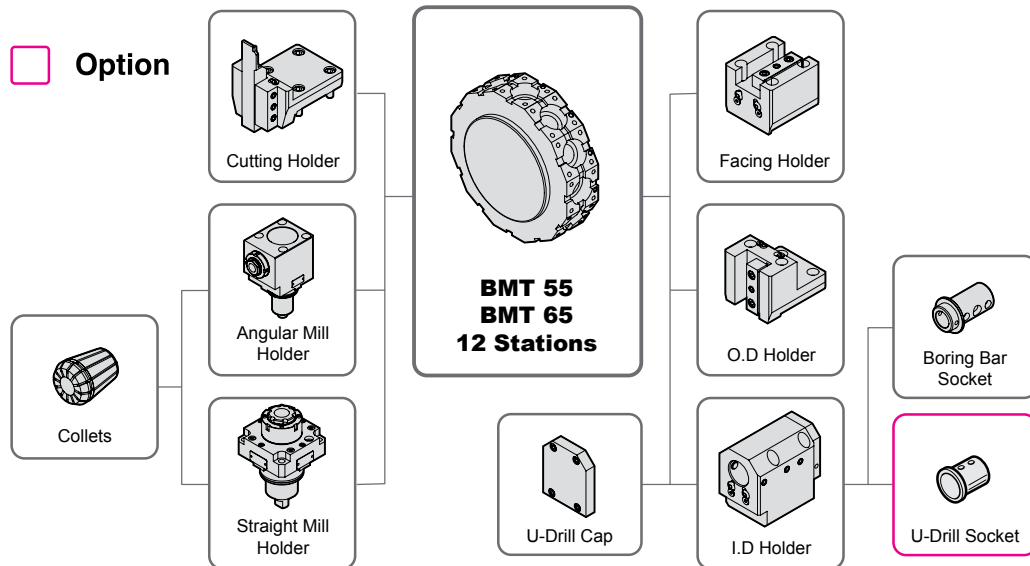
| ITEM           |                      |               | HD2600/L |           | HD3100A |           | HD3100  |           | HD3100L |           |
|----------------|----------------------|---------------|----------|-----------|---------|-----------|---------|-----------|---------|-----------|
|                |                      |               | mm Unit  | inch Unit | mm Unit | inch Unit | mm Unit | inch Unit | mm Unit | inch Unit |
| Turning Holder | O.D Holder           | Right/Left    | -        | -         | -       | -         | -       | -         | -       | -         |
|                |                      | Extension     | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                | Facing Holder        |               | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
| Boring Holder  | I.D Holder           | Single        | 5        | 5         | 5       | 5         | 5       | 5         | 5       | 5         |
|                | U-Drill Holder       | Cap           | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
| Driven Holder  | Straight Mill Holder | Standard      | -        | -         | -       | -         | -       | -         | -       | -         |
|                |                      | TTC           | -        | -         | -       | -         | -       | -         | -       | -         |
|                | Angular Mill Holder  | Standard      | -        | -         | -       | -         | -       | -         | -       | -         |
|                |                      | TTC           | -        | -         | -       | -         | -       | -         | -       | -         |
| Socket         | Boring               | Ø12 (Ø1/2")   | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                |                      | Ø16 (Ø5/8")   | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                |                      | Ø20 (Ø3/4")   | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                |                      | Ø25 (Ø1")     | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                |                      | Ø32 (Ø1 1/4") | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                |                      | Ø40 (Ø1 1/2") | 1        | 1         | 1       | 1         | 1       | 1         | 1       | 1         |
|                | Drill                | MT 1 x MT 2   | Opt.     | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      |
|                |                      | MT 2          | Opt.     | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      |
|                |                      | MT 3          | Opt.     | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      |
|                |                      | MT 4          | Opt.     | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      | Opt.    | Opt.      |
|                | ER Collet            |               | -        | -         | -       | -         | -       | -         | -       | -         |

Specifications are subject to change without notice for improvement. (HD3100 Series - I.D. Tool Holder Single/U-drill <Combined Use>)

# SPECIFICATIONS

## Tooling System

unit : mm(in)



## Tooling Parts Detail

| ITEM           |                      |               | HD2600M/LM |           | HD3100MA |           | HD3100M |           | HD3100LM |           |
|----------------|----------------------|---------------|------------|-----------|----------|-----------|---------|-----------|----------|-----------|
|                |                      |               | mm Unit    | inch Unit | mm Unit  | inch Unit | mm Unit | inch Unit | mm Unit  | inch Unit |
| Turning Holder | O.D Holder           | Right/Left    | 4          | 4         | 4        | 4         | 4       | 4         | 4        | 4         |
|                | Cutting Holder       |               | -          | -         | -        | -         | -       | -         | -        | -         |
|                | Facing Holder        |               | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
| Boring Holder  | I.D Holder           | Single        | 3          | 3         | 3        | 3         | 3       | 3         | 3        | 3         |
|                | U-Drill              | Cap           | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
| Driven Holder  | Straight Mill Holder | Standard      | 2          | 2         | 2        | 2         | 2       | 2         | 2        | 2         |
|                |                      | TTC           | -          | -         | -        | -         | -       | -         | -        | -         |
|                | Angular Mill Holder  | Standard      | 2          | 2         | 2        | 2         | 2       | 2         | 2        | 2         |
|                |                      | TTC           | -          | -         | -        | -         | -       | -         | -        | -         |
| Socket         | Boring               | Ø10 (Ø3/8")   | 1          | 1         | -        | -         | -       | -         | -        | -         |
|                |                      | Ø12 (Ø1/2")   | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
|                |                      | Ø16 (Ø5/8")   | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
|                |                      | Ø20 (Ø3/4")   | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
|                |                      | Ø25 (Ø1")     | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
|                |                      | Ø32 (Ø1 1/4") | 1          | 1         | 1        | 1         | 1       | 1         | 1        | 1         |
|                |                      | Ø40 (Ø1 1/2") | -          | -         | 1        | 1         | 1       | 1         | 1        | 1         |
|                | Drill                | MT 1 x MT 2   | Opt.       | Opt.      | Opt.     | Opt.      | Opt.    | Opt.      | Opt.     | Opt.      |
|                |                      | MT 2          | Opt.       | Opt.      | Opt.     | Opt.      | Opt.    | Opt.      | Opt.     | Opt.      |
|                |                      | MT 3          | Opt.       | Opt.      | Opt.     | Opt.      | Opt.    | Opt.      | Opt.     | Opt.      |
|                |                      | MT 4          | -          | -         | Opt.     | Opt.      | Opt.    | Opt.      | Opt.     | Opt.      |
|                | ER Collet            |               | 1 Set      | 1 Set     | 1 Set    | 1 Set     | 1 Set   | 1 Set     | 1 Set    | 1 Set     |
|                | Adapter Set          |               | Opt.       | Opt.      | Opt.     | Opt.      | Opt.    | Opt.      | Opt.     | Opt.      |

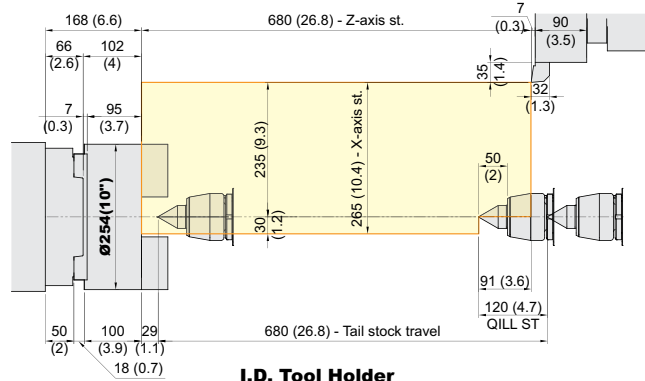
# SPECIFICATIONS

Tooling Travel Range (HD2600)

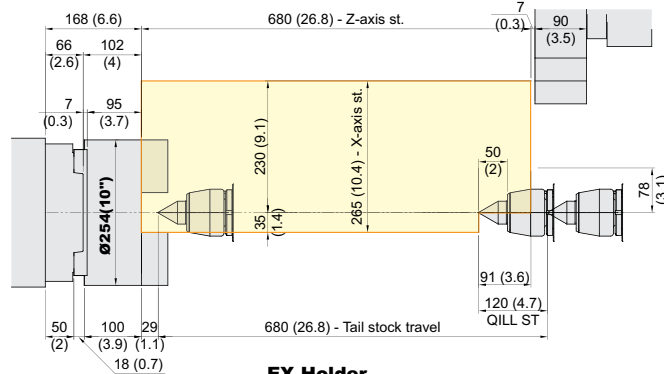
unit : mm(in)

## HD2600

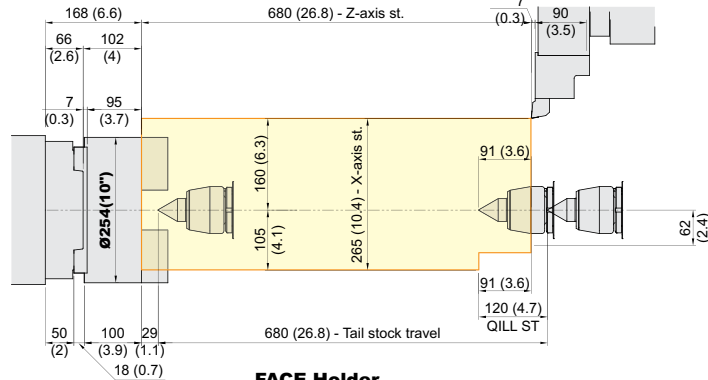
### Tool Holder



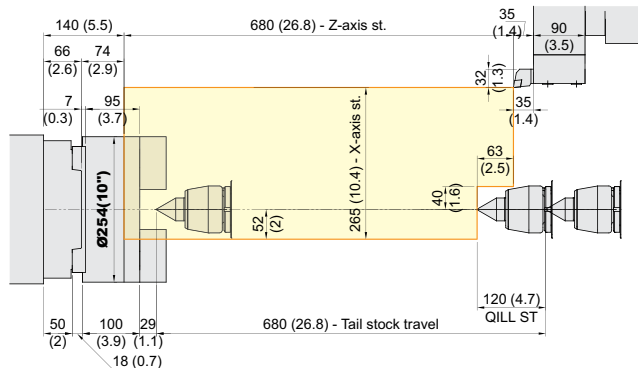
### I.D. Tool Holder



### EX Holder



### FACE Holder



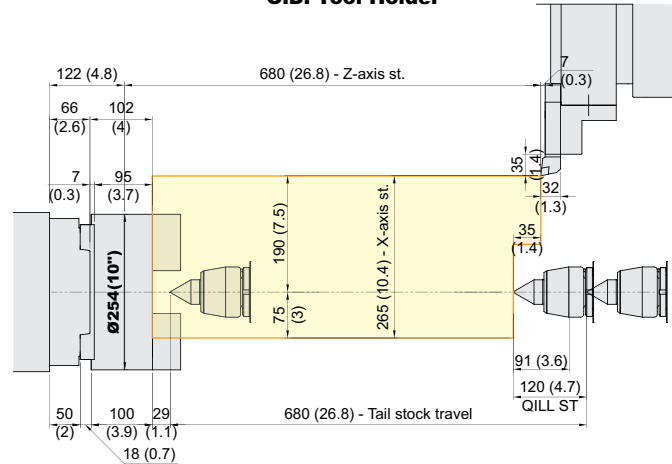
# SPECIFICATIONS

Tooling System (HD2600M)

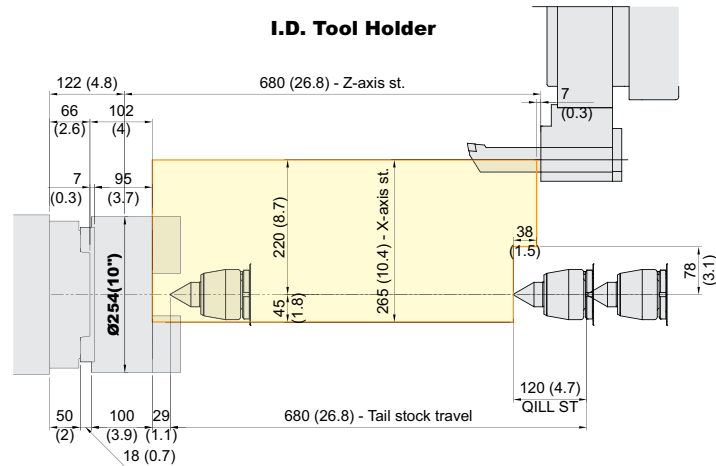
unit : mm(in)

## HD2600M

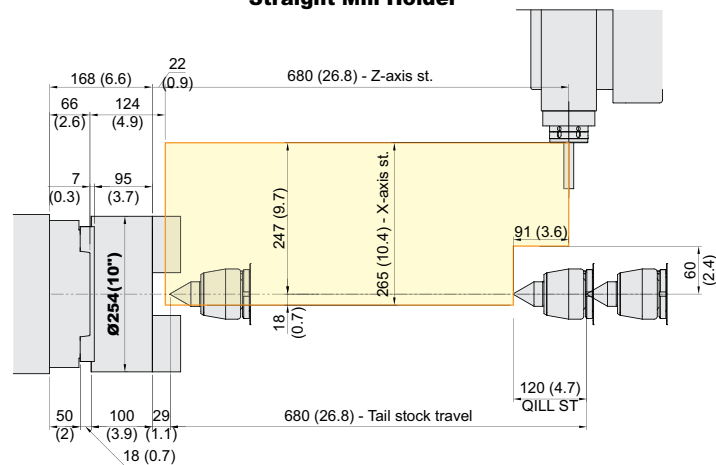
### O.D. Tool Holder



### I.D. Tool Holder



### Straight Mill Holder

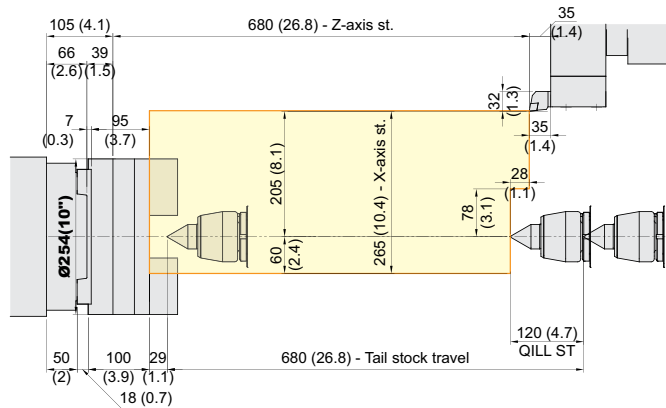


**HD2600/3100 Series**  
CNC Turning Center

$$\begin{array}{r} 26 \\ + \\ 27 \end{array}$$

unit : mm(in)

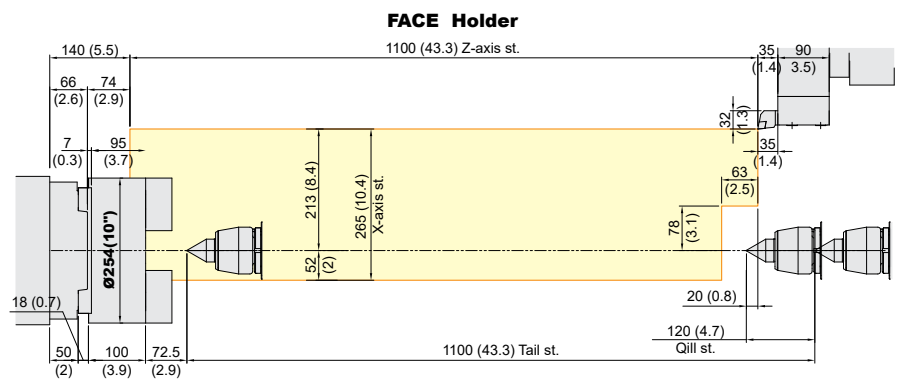
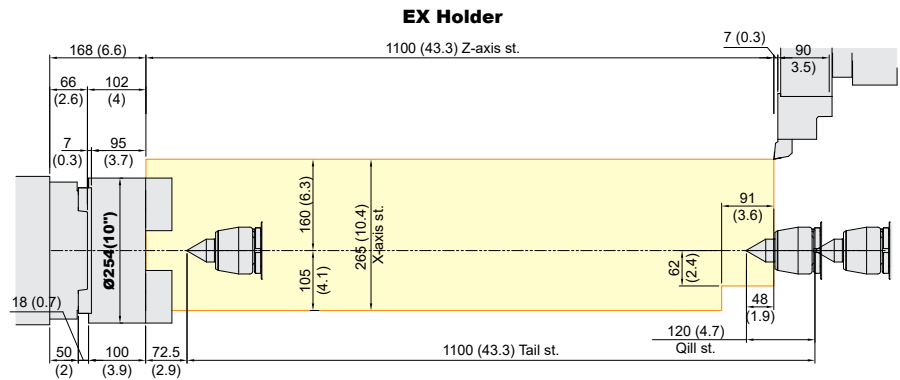
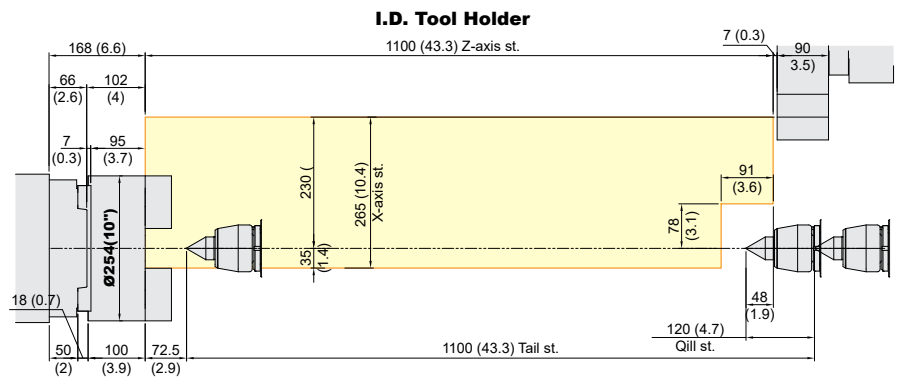
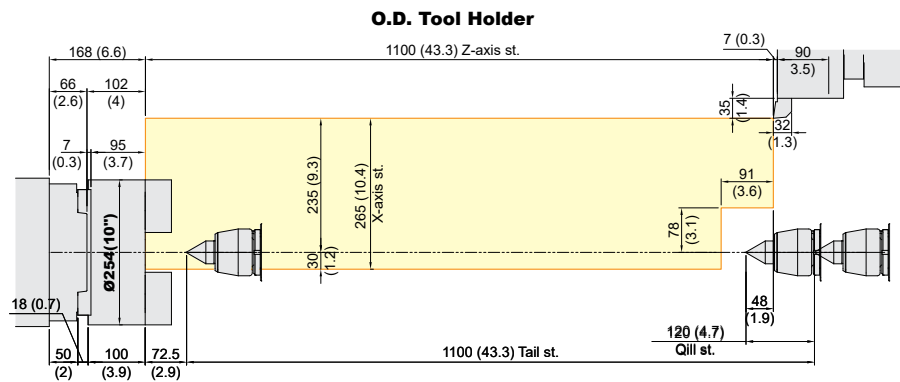
## FACE Holder



Technical drawing of the Angular Mini Holder showing dimensions in mm and inches. The drawing includes a side view and a top view. The side view shows a total length of 680 mm (26.8 inches) for the Z-axis stroke and 680 mm (26.8 inches) for the tail stock travel. The top view shows a total width of 120 mm (4.7 inches) for the QILL ST. The drawing also shows a total length of 111 mm (4.4 inches) for the Z-axis stroke and 102 mm (4 inches) for the tail stock travel. The drawing includes a total length of 680 mm (26.8 inches) for the Z-axis stroke and 680 mm (26.8 inches) for the tail stock travel. The drawing also shows a total length of 111 mm (4.4 inches) for the Z-axis stroke and 102 mm (4 inches) for the tail stock travel.



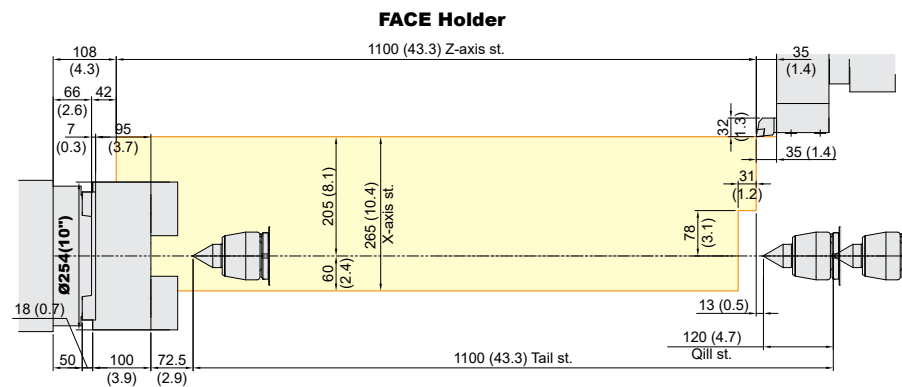
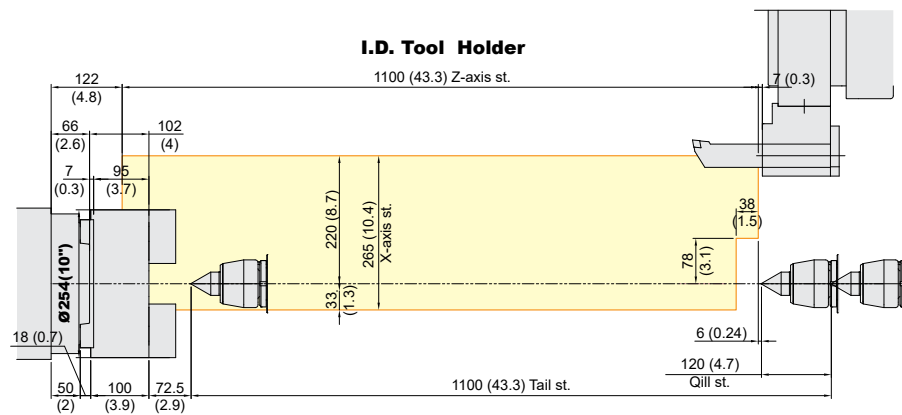
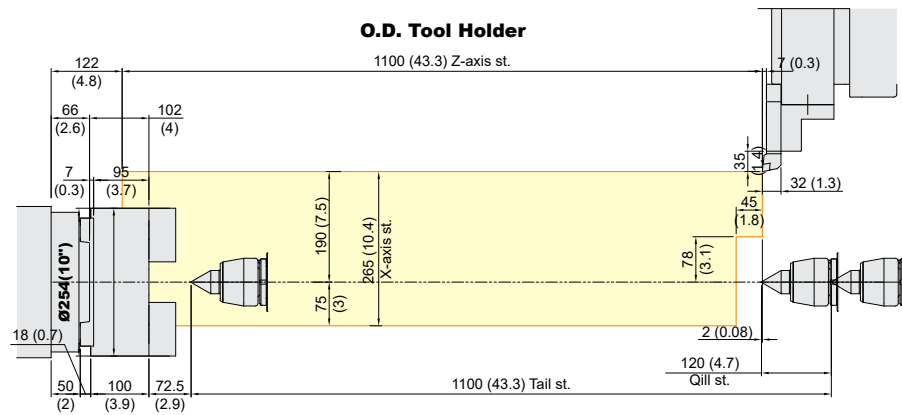
### Tooling Travel Range (HD2600L)



# SPECIFICATIONS

## Tooling Travel Range (HD2600LM)

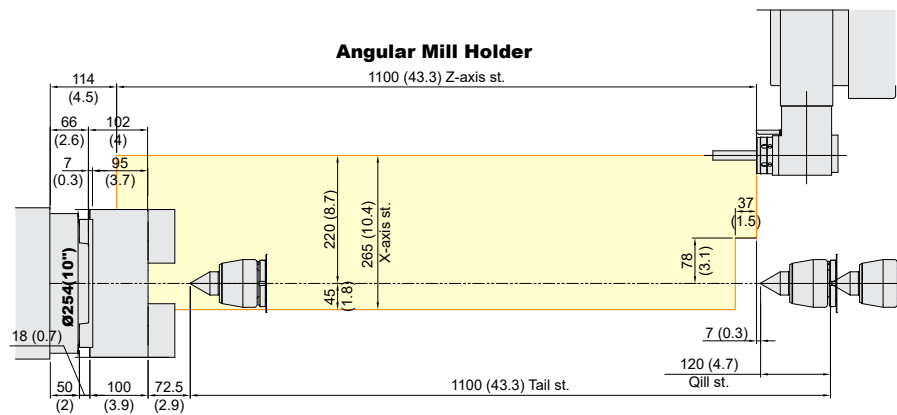
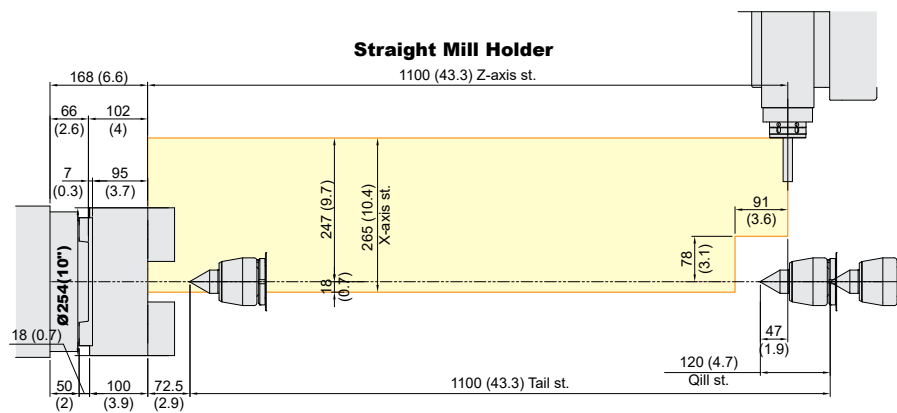
unit : mm(in)



# SPECIFICATIONS

Tooling Travel Range (HD2600LM)

unit : mm(in)

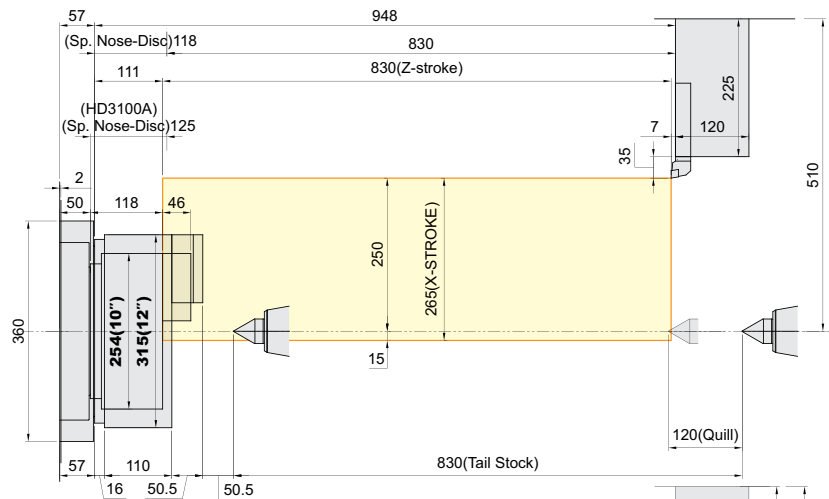


# SPECIFICATIONS

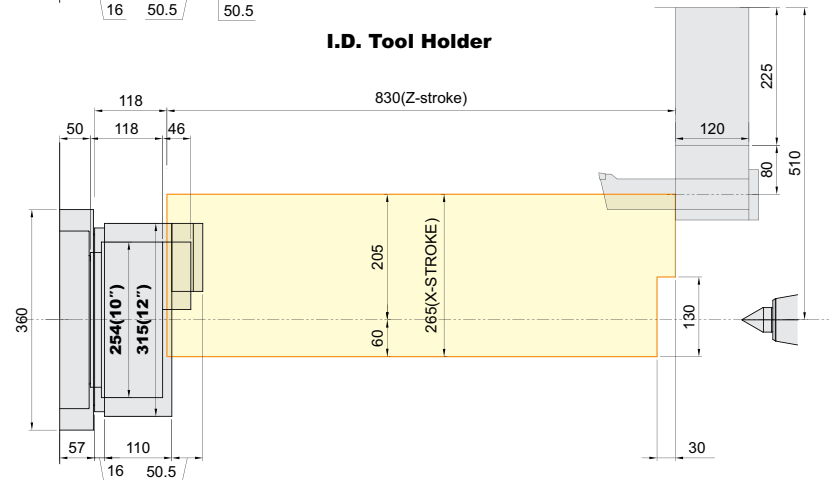
Tooling Travel Range (HD3100A | HD3100)

unit : mm(in)

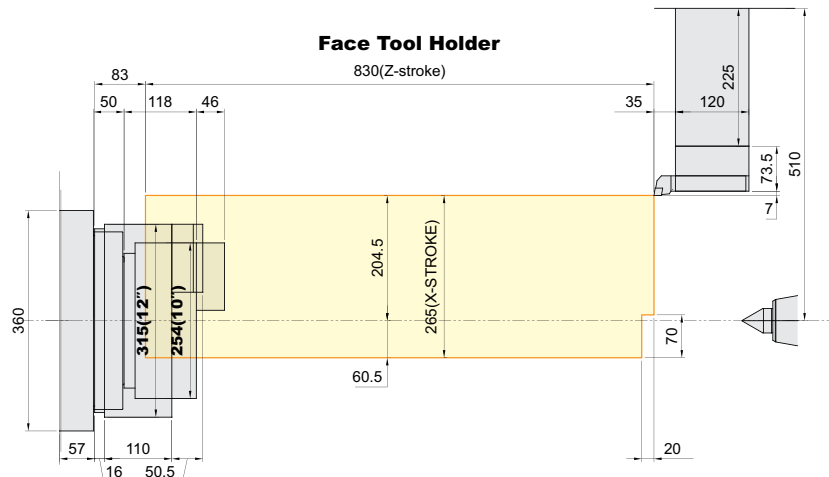
## O.D. Tool Holder



## I.D. Tool Holder



## Face Tool Holder



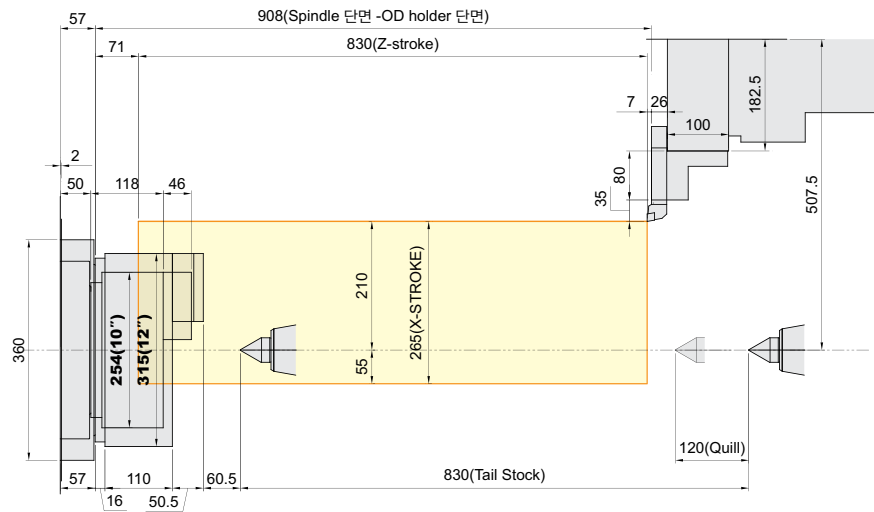
### Tooling Travel Range (HD3100L)

# SPECIFICATIONS

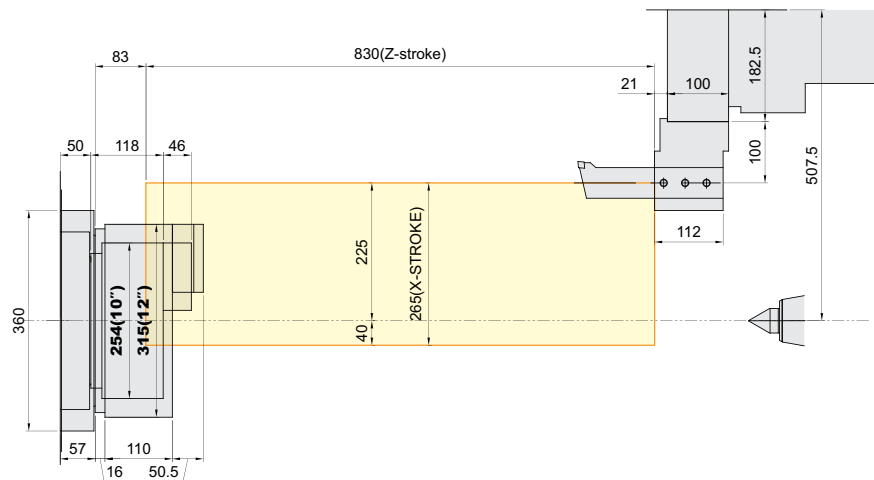
Tooling Travel Range (HD3100MA | HD3100M)

unit : mm(in)

## O.D. Tool Holder



## I.D. Tool Holder



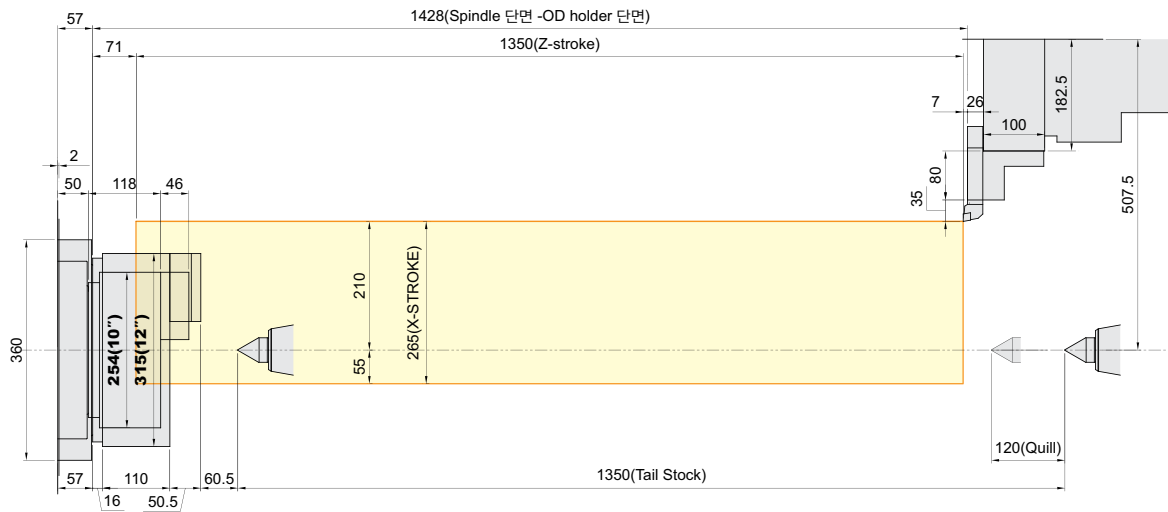


# SPECIFICATIONS

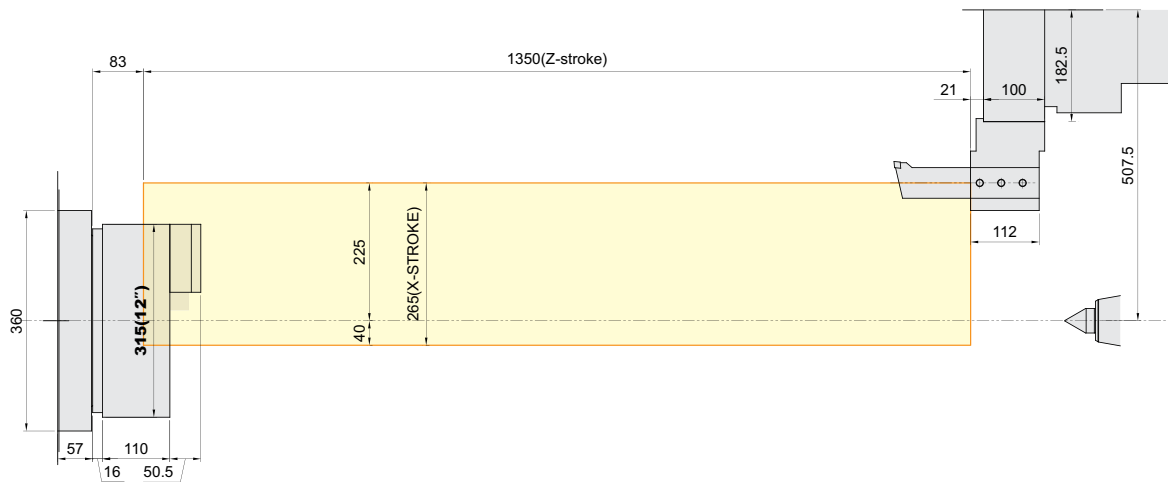
Tooling Travel Range (HD3100LM)

unit : mm(in)

## O.D. Tool Holder



## I.D. Tool Holder



# SPECIFICATIONS

## Specifications

[ ] : Option

| MODEL         |                           |    | HD2600       | HD2600M                                          | HD2600L                                            | HD2600LM                    |                       |
|---------------|---------------------------|----|--------------|--------------------------------------------------|----------------------------------------------------|-----------------------------|-----------------------|
| CAPACITY      | Swing Over the Bed        |    | mm(in)       | Ø630 (24.8")                                     |                                                    |                             |                       |
|               | Swing Over the Carriage   |    | mm(in)       | Ø460 (18.1")                                     |                                                    |                             |                       |
|               | Max. Turning Dia.         |    | mm(in)       | Ø460 (18.1")                                     | Ø380 (15")                                         | Ø460 (18.1")                | Ø380 (15")            |
|               | Max. Turning Length       |    | mm(in)       | 659 (25.9")                                      | 613 (24.1")                                        | 1079 (42.4")                | 1033 (40.6")          |
|               | Bar Capacity              |    | mm(in)       | Ø81 (3.2")                                       |                                                    |                             |                       |
| SPINDLE       | Chuck Size                |    | inch         | 10" [12"]                                        | 10"                                                | 10" [12"]                   | 10"                   |
|               | Spindle Bore              |    | mm(in)       | Ø91 (3.6")                                       |                                                    |                             |                       |
|               | Spindle Speed (rpm)       |    | r/min        | 3,500 [2,800]                                    | 3,500 [3,000]                                      | 3,500                       |                       |
|               | Motor (Max/Cont.)         |    | kW(HP)       | 26/18.5 (35/25)<br>[26/18.5 (35/25)]             | 26/18.5 (35/25)<br>[53.2/28(71.3/37.5)]            | 26/18.5 (35/25)             |                       |
|               | Torque (Max/Cont.)        |    | N·m (lbf·ft) | 734/522 (541.4/385)<br>[1,123/657 (828.7/484.6)] | 734/522 (541.4/385)<br>[1,015/534.5 (749.1/394.2)] | 734/522 (541.4/385)         |                       |
|               | Spindle Type              |    | -            | BELT                                             |                                                    |                             |                       |
|               | Spindle Nose              |    | -            | A2-8                                             |                                                    |                             |                       |
|               | C-axis Indexing           |    | deg          | -                                                | 0.001 °                                            | -                           | 0.001 °               |
| FEED          | Travel (X/Z)              |    | mm(in)       | 265/680 (10.4"/26.8")                            |                                                    | 265/1,100 (10.4"/43.3")     |                       |
|               | Rapid Traverse Rate (X/Z) |    | m/min (ipm)  | 24/30 (945/1,181)                                |                                                    |                             |                       |
|               | Slide Type                |    | -            | BOX GUIDE                                        |                                                    |                             |                       |
| TURRET        | No. of Tools              |    | ea           | 10 [12]                                          | 12                                                 | 10 [12]                     | 12                    |
|               | Tool Size                 | OD | mm(in)       | □25 (□1")                                        |                                                    |                             |                       |
|               |                           | ID | mm(in)       | Ø50 (Ø2")                                        | Ø40 (Ø1.6")                                        | Ø50 (Ø2")                   | Ø40 (Ø1.6")           |
|               | Indexing Time             |    | sec          | 0.15                                             |                                                    |                             |                       |
| LIVE TOOL     | Motor (Max/Cont.)         |    | kW(HP)       | -                                                | 5.5/3.7 (7.4/5)<br>[4.2/2.8(5.6/3.7)]              | -                           | 5.5/3.7 (7.4/5)       |
|               | Milling Tool Speed (rpm)  |    | r/min        | -                                                | 6,000 [6,000]                                      | -                           | 6,000                 |
|               | Torque (Max/Cont.)        |    | N·m (lbf·ft) | -                                                | 52.5/26.5 (38.7/19.5)<br>[40.1/26.7(29.6/19.7)]    | -                           | 52.5/26.5 (38.7/19.5) |
|               | Collet Size               |    | mm(in)       | -                                                | Ø16 (0.6") - ER25                                  | -                           | Ø16 (0.6") - ER25     |
|               | Type                      |    | -            | -                                                | BMT55                                              | -                           | BMT55                 |
| TAIL STOCK    | Taper                     |    | -            | MT#5 [Built-in Tail Stock : MT#4]                |                                                    |                             |                       |
|               | Quill Dia.                |    | mm(in)       | Ø100 (3.9)                                       |                                                    |                             |                       |
|               | Quill Travel              |    | mm(in)       | 120 (4.7")                                       |                                                    |                             |                       |
|               | Travel                    |    | mm(in)       | 680 (26.8")                                      |                                                    | 1,100 (43.3")               |                       |
| TANK CAPACITY | Coolant Tank              |    | ℓ (gal)      | 180 (47.6)                                       |                                                    | 230 (60.7)                  |                       |
|               | Lubricating Tank          |    | ℓ (gal)      | 1.8 (0.5)                                        |                                                    |                             |                       |
| POWER SUPPLY  | Electric Power Supply     |    | kVA          | 27                                               |                                                    |                             |                       |
|               | Thickness of Power Cable  |    | mm²          | Over 16                                          |                                                    |                             |                       |
|               | Voltage                   |    | V/Hz         | 220/60 (200/50)                                  |                                                    |                             |                       |
| MACHINE       | Floor Space (L×W)         |    | mm(in)       | 3,400×1,708 (133.9"×67.2")                       |                                                    | 3,893×1,996 (153.2"×78.5")  |                       |
|               | Height                    |    | mm(in)       | 1,755 (69.1")                                    |                                                    |                             |                       |
|               | Weight                    |    | kg(lb)       | 5,800 (12,787)                                   |                                                    | 6,750 (14,881)              | 6,800 (14,991)        |
| NC            | Controller                |    | -            | FANUC i Series - Smart Plus                      | FANUC i Series - Smart Plus<br>[SIEMENS 828D]      | FANUC i Series - Smart Plus |                       |

Specifications are subject to change without notice for improvement.

# SPECIFICATIONS

## Specifications

[ ] : Option

| MODEL         |                           |                 | HD3100A                           | HD3100MA                                    |
|---------------|---------------------------|-----------------|-----------------------------------|---------------------------------------------|
| CAPACITY      | Swing Over the Bed        | mm(in)          | Ø750 (29.5")                      |                                             |
|               | Swing Over the Carriage   | mm(in)          | Ø500 (19.7")                      |                                             |
|               | Max. Turning Dia.         | mm(in)          | Ø500 (19.7")                      | Ø420 (16.5")                                |
|               | Max. Turning Length       | mm(in)          | 780 (30.7")                       | 740 (29.1)                                  |
|               | Bar Capacity              | mm(in)          | Ø81 (3.2")                        |                                             |
| SPINDLE       | Chuck Size                | inch            | 10"                               |                                             |
|               | Spindle Bore              | mm(in)          | Ø91 (3.6")                        |                                             |
|               | Spindle Speed (rpm)       | r/min           | 3,500                             |                                             |
|               | Motor (Max/Cont.)         | kW(HP)          | 26/18.5 (35/25)                   |                                             |
|               | Torque (Max/Cont.)        | N·m (lbf·ft)    | 734/522 (541.4/385)               |                                             |
|               | Spindle Type              | -               | BELT                              |                                             |
|               | Spindle Nose              | -               | A2-8                              |                                             |
|               | C-axis Indexing           | deg             | -                                 | 0.001 °                                     |
| FEED          | Travel (X/Z)              | mm(in)          | 265/830 (10.4"/32.7")             |                                             |
|               | Rapid Traverse Rate (X/Z) | m/min (ipm)     | 24/30 (945/1,181)                 |                                             |
|               | Slide Type                | -               | BOX GUIDE                         |                                             |
| TURRET        | No. of Tools              | ea              | 10 [12]                           | 12                                          |
|               | Tool Size                 | OD mm(in)       | □25 (□1")                         |                                             |
|               |                           | ID mm(in)       | Ø50 (Ø2")                         |                                             |
|               | Indexing Time             | sec             | 0.15                              |                                             |
| LIVE TOOL     | Motor (Max/Cont.)         | kW(HP)          | -                                 | 5.5/3.7 (7.4/5) [7.5/3.7 (10/5)]            |
|               | Milling Tool Speed (rpm)  | r/min           | -                                 | 5,000                                       |
|               | Torque (Max/Cont.)        | N·m (lbf·ft)    | -                                 | 70/35.4 (51.6/26.1) [95.5/35.4 (70.4/26.1)] |
|               | Collet Size               | mm(in)          | -                                 | Ø25 (1") - ER32                             |
|               | Type                      | -               | -                                 | BMT65P                                      |
| TAIL STOCK    | Taper                     | -               | MT#5 [BUILT-IN TAIL STOCK : MT#4] |                                             |
|               | Quill Dia.                | mm(in)          | Ø100 (3.9)                        |                                             |
|               | Quill Travel              | mm(in)          | 120 (4.7")                        |                                             |
|               | Travel                    | mm(in)          | 830 (32.7")                       |                                             |
| TANK CAPACITY | Coolant Tank              | ℓ (gal)         | 200 (52.8)                        |                                             |
|               | Lubricating Tank          | ℓ (gal)         | 1.8 (0.5)                         |                                             |
| POWER SUPPLY  | Electric Power Supply     | kVA             | 27                                |                                             |
|               | Thickness of Power Cable  | mm <sup>2</sup> | Over 16                           |                                             |
|               | Voltage                   | V/Hz            | 220/60 (200/50)                   |                                             |
| MACHINE       | Floor Space (L×W)         | mm(in)          | 3,885×1,800 (153"×70.9")          |                                             |
|               | Height                    | mm(in)          | 1,850 (72.8")                     |                                             |
|               | Weight                    | kg(lb)          | 5,950 (13,116)                    | 6,000 (13,228)                              |
| NC            | Controller                | -               | FANUC i Series - Smart Plus       |                                             |

Specifications are subject to change without notice for improvement.

# CONTROLLER

## Specifications

[ ]: Option

| MODEL         |                           |              | HD3100                                                   | HD3100L                       | HD3100M                                     | HD3100LM                      |
|---------------|---------------------------|--------------|----------------------------------------------------------|-------------------------------|---------------------------------------------|-------------------------------|
| CAPACITY      | Swing Over the Bed        | mm(in)       | Ø750 (29.5")                                             |                               |                                             |                               |
|               | Swing Over the Carriage   | mm(in)       | Ø500 (19.7")                                             |                               |                                             |                               |
|               | Max. Turning Dia.         | mm(in)       | Ø500 (19.7")                                             |                               | Ø420 (16.5")                                |                               |
|               | Max. Turning Length       | mm(in)       | 780 (30.7")                                              | 1,300 (51.2")                 | 740 (29.1")                                 | 1,260 (49.6")                 |
|               | Bar Capacity              | mm(in)       | Ø102 (4")                                                |                               |                                             |                               |
| SPINDLE       | Chuck Size                | inch         | 12"                                                      |                               |                                             |                               |
|               | Spindle Bore              | mm(in)       | Ø115 (4.5")                                              |                               |                                             |                               |
|               | Spindle Speed (rpm)       | r/min        | 2,800 [2,800]                                            |                               | 2,800                                       |                               |
|               | Motor (Max/Cont.)         | kW(HP)       | 26/18.5 (35/25) [35/22 (47/29.5)]                        |                               | 26/18.5 (35/25)                             |                               |
|               | Torque (Max/Cont.)        | N·m (lbf·ft) | 1,123/657 (828.7/484.6)<br>[1,613/1,014 (1,189.7/747.9)] |                               | 1,123/657 (828.7/484.6)                     |                               |
|               | Spindle Type              | -            | BELT [GEAR]                                              |                               | BELT                                        |                               |
|               | Spindle Nose              | -            | A2-11                                                    |                               |                                             |                               |
|               | C-axis Indexing           | deg          | -                                                        |                               | 0.001 °                                     |                               |
| FEED          | Travel (X/Z)              | mm(in)       | 265/830<br>(10.4"/32.7")                                 | 265/1,350<br>(10.4"/53.1")    | 265/830<br>(10.4"/32.7")                    | 265/1,350<br>(10.4"/53.1")    |
|               | Rapid Traverse Rate (X/Z) | m/min (ipm)  | 24/30 (945/1,181)                                        |                               |                                             |                               |
|               | Slide Type                | -            | BOX GUIDE                                                |                               |                                             |                               |
| TURRET        | No. of Tools              | ea           | 10 [12]                                                  |                               | 12                                          |                               |
|               | Tool Size                 | OD           | mm(in)                                                   |                               | □25 (□1")                                   |                               |
|               |                           | ID           | mm(in)                                                   |                               | Ø50 (Ø2")                                   |                               |
|               | Indexing Time             | sec          | 0.15                                                     |                               |                                             |                               |
| LIVE TOOL     | Motor (Max/Cont.)         | kW(HP)       | -                                                        |                               | 5.5/3.7 (7.4/5) [7.5/3.7 (10/5)]            |                               |
|               | Milling Tool Speed (rpm)  | r/min        | -                                                        |                               | 5,000                                       |                               |
|               | Torque (Max/Cont.)        | N·m (lbf·ft) | -                                                        |                               | 70/35.4 (51.6/26.1) [95.5/35.4 (70.4/26.1)] |                               |
|               | Collet Size               | mm(in)       | -                                                        |                               | Ø25 (1") - ER32                             |                               |
|               | Type                      | -            | -                                                        |                               | BMT65P                                      |                               |
| TAIL STOCK    | Taper                     | -            | MT#5                                                     |                               |                                             |                               |
|               | Quill Dia.                | mm(in)       | Ø100 (3.9")                                              |                               |                                             |                               |
|               | Quill Travel              | mm(in)       | 120 (4.7")                                               |                               |                                             |                               |
|               | Travel                    | mm(in)       | 830 (32.7")                                              | 1,350 (53.1")                 | 830 (32.7")                                 | 1,350 (53.1")                 |
| TANK CAPACITY | Coolant Tank              | ℓ (gal)      | 200 (52.8)                                               | 220 (58.1)                    | 200 (52.8)                                  | 220 (58.1)                    |
|               | Lubricating Tank          | ℓ (gal)      | 1.8 (0.5)                                                |                               |                                             |                               |
| POWER SUPPLY  | Electric Power Supply     | kVA          | Belt : 27 [Gear : 30]                                    |                               | 27                                          |                               |
|               | Thickness of Power Cable  | mm²          | Over 16                                                  |                               |                                             |                               |
|               | Voltage                   | V/Hz         | 220/60 (200/50)                                          |                               |                                             |                               |
| MACHINE       | Floor Space (L×W)         | mm(in)       | 3,885×1,800<br>(153"×70.9")                              | 4,405×1,978<br>(173.4"×77.9") | 3,885×1,800<br>(153"×70.9")                 | 4,405×1,978<br>(173.4"×77.9") |
|               | Height                    | mm(in)       | 1,850 (72.8")                                            |                               |                                             |                               |
|               | Weight                    | kg(lb)       | 6,000 (13,228)                                           | 7,200 (15,873)                | 6,050 (13,338)                              | 7,250 (15,984)                |
| NC            | Controller                | -            | FANUC i Series - Smart Plus                              |                               |                                             |                               |

※ Prior consultation is required when applying spindle contouring control for gear driven spindle.  
Specifications are subject to change without notice for improvement.

# CONTROLLER

## FANUC i Series - Smart Plus

[ ] : Option

| Controlled axis / Display / Accuracy Compensation |                                                                                                                                                  |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Control axis                                      | 2 axis (X, Z) / 3 axis (X, Z, C) / 4 axis (X, Z, Y, C)<br>5 axis (X, Z, B, C, A) / 6 axis (X, Z, Y, B, C, A)<br>7 axis (X1/Z1, X2/Z2, B2, C1/C2) |
| Simultaneously controlled axis                    | 2 axis [Max. 4 axis]                                                                                                                             |
| Designation of spindle axis                       | 3 axis [Max. 4 axis]                                                                                                                             |
| Least setting Unit                                | X, Z, Y, B axis : 0.001 mm (0.0001 inch)<br>C, A axis : 0.001 deg                                                                                |
| Least input increment                             | X, Z, Y, B axis : 0.001 mm (0.0001 inch)<br>C, A axis : 0.001 deg                                                                                |
| Inch / Metric conversion                          | G20 / G21                                                                                                                                        |
| High response vector control                      |                                                                                                                                                  |
| Interlock                                         | All axis / Each axis                                                                                                                             |
| Machine lock                                      | All axis                                                                                                                                         |
| Backlash compensation                             | ± 0~9999 pulses (exc.Rapid traverse / Cutting feed)                                                                                              |
| Position switch                                   |                                                                                                                                                  |
| LCD / MDI                                         | 15 inch LCD unit (with Touch Panel)                                                                                                              |
| Feedback                                          | Absolute motor feedback                                                                                                                          |
| Stored stroke check 1                             | Over travel                                                                                                                                      |
| Stored stroke check 2, 3                          |                                                                                                                                                  |
| PMC axis control                                  |                                                                                                                                                  |
| Operation                                         |                                                                                                                                                  |
| Automatic operation (Memory)                      |                                                                                                                                                  |
| MDI operation                                     |                                                                                                                                                  |
| DNC operation                                     | Needed DNC software / CF card                                                                                                                    |
| Program restart                                   |                                                                                                                                                  |
| Wrong operation prevention                        |                                                                                                                                                  |
| Program check function                            | Dry run                                                                                                                                          |
| Single block                                      |                                                                                                                                                  |
| Search function                                   | Program Number / Sequence Number                                                                                                                 |
| Interpolation functions                           |                                                                                                                                                  |
| Nano interpolation                                |                                                                                                                                                  |
| Positioning                                       | G00                                                                                                                                              |
| Linear interpolation                              | G01                                                                                                                                              |
| Circular interpolation                            | G02, G03                                                                                                                                         |
| Exact stop mode                                   | Single : G09, Continuous : G61                                                                                                                   |
| Dwell                                             | G04, 0 ~ 9999.9999 sec                                                                                                                           |
| Skip                                              | G31                                                                                                                                              |
| Reference position return                         | 1st reference : G28, 2nd reference : G30<br>Ref. position check : G27                                                                            |
| Thread synchronous cutting                        | G33                                                                                                                                              |
| Thread cutting retract                            |                                                                                                                                                  |
| Variable lead thread cutting                      |                                                                                                                                                  |
| Multi / Continuous threading                      |                                                                                                                                                  |
| Feed function / Acc. & Dec. control               |                                                                                                                                                  |
| Manual feed                                       | Rapid traverse<br>Jog : 0~2,000 mm/min (79 ipm)<br>Manual handle : x1, x10, x100 pulses<br>Reference position return                             |
| Cutting Feed command                              | Direct input F code                                                                                                                              |
| Feedrate override                                 | 0 ~ 200% (10% Unit)                                                                                                                              |
| Rapid traverse override                           | 1%, F25%, 50%, 100%                                                                                                                              |
| Override cancel                                   |                                                                                                                                                  |
| Feed per minute                                   | G98                                                                                                                                              |
| Feed per revolution                               | G99                                                                                                                                              |
| Look-ahead block                                  | 1 block                                                                                                                                          |
| Program input                                     |                                                                                                                                                  |
| Tape Code                                         | EIA / ISO                                                                                                                                        |
| Optional block skip                               | 9 ea                                                                                                                                             |
| Program stop / end                                | M00, M01 / M02, M30                                                                                                                              |
| Maximum command unit                              | ± 999,999.999 mm (± 99,999.9999 inch)                                                                                                            |
| Plane selection                                   | X-Y : G17 / Z-X : G18 / Y-Z : G19                                                                                                                |
| Workpiece coordinate system                       | G52, G53, 6 pairs (G54 ~ G59)                                                                                                                    |
| Manual absolute                                   | Fixed ON                                                                                                                                         |
| Programmable data input                           | G10                                                                                                                                              |
| Sub program call                                  | 10 folds nested                                                                                                                                  |
| Custom macro                                      | #100 ~ #199, #500 ~ #999                                                                                                                         |
| G code system                                     | A, B/C                                                                                                                                           |
| Programmable mirror image                         | G51.1, G50.1                                                                                                                                     |
| G code preventing buffering                       | G4.1                                                                                                                                             |
| Direct drawing dimension program                  | Including Chamfering / Corner R                                                                                                                  |
| Conversational Program                            | Smart Guide-i                                                                                                                                    |

| Program input                               |                                                    |
|---------------------------------------------|----------------------------------------------------|
| Multiple repetitive cycles I , II           |                                                    |
| Canned cycle for turning                    |                                                    |
| Auxiliary function / Spindle speed function |                                                    |
| Auxiliary function                          | M & 4 digit                                        |
| Level-up M Code                             | High speed / Multi / Bypass M code                 |
| Spindle speed function                      | S & 5 digit , Binary output                        |
| Spindle override                            | 0% ~ 150% (10% Unit)                               |
| Multi position spindle orientation          | M19 (S##)                                          |
| Rigid tapping                               |                                                    |
| Constant surface speed control              | G96, G97                                           |
| Tool function / Tool compensation           |                                                    |
| Tool function                               | T & 2 digit + Offset 2 digit                       |
| Tool life management                        |                                                    |
| Tool offset pairs                           | 128 pairs                                          |
| Tool nose radius compensation               | G40, G41, G42                                      |
| Geometry / Wear compensation                |                                                    |
| Direct input of offset measured B           |                                                    |
| Editing function                            |                                                    |
| Part program storage size                   | 5,120m (2MB)                                       |
| No. of registerable programs                | 1,000 ea                                           |
| Program protect                             |                                                    |
| Background editing                          |                                                    |
| Extended part program editing               | Copy, move and change of NC program                |
| Memory card program edit                    |                                                    |
| Data input / output & Interface             |                                                    |
| I/O interface                               | CF card, USB memory<br>Embedded Ethernet interface |
| Screen hard copy                            |                                                    |
| External message                            |                                                    |
| External key input                          |                                                    |
| External workpiece number search            |                                                    |
| Automatic data backup                       |                                                    |
| Setting, display and diagnosis              |                                                    |
| Self-diagnosis function                     |                                                    |
| History display & Operation                 | Alarm & Operator message & Operation               |
| Run hour / Parts count display              |                                                    |
| Maintenance information                     |                                                    |
| Actual cutting feedrate display             |                                                    |
| Display of spindle speed / T code           |                                                    |
| Graphic display                             |                                                    |
| Operating monitor screen                    | Spindle / Servo load etc.                          |
| Power consumption monitoring                | Spindle & Servo                                    |
| Spindle / Servo setting screen              |                                                    |
| Multi language display                      | Support 24 languages                               |
| Display language switching                  | Selection of 5 optional Languages                  |
| LCD Screen Saver                            | Screen saver                                       |
| Unexpected disturbance torque               | BST (Back spin torque limit)                       |
| Function for machine type                   |                                                    |
| Cs contour control (C & A axis)             | Mill, MS, Y, SY, LF-Mill, TTMS, TTSY               |
| Polar coordinate interpolation              | Mill, MS, Y, SY, LF-Mill, TTMS, TTSY               |
| Cylindrical interpolation                   | Mill, MS, Y, SY, LF-Mill, TTMS, TTSY               |
| Polygon turning (2 Spindles)                | Mill, MS, Y, SY, LF-Mill, TTMS, TTSY               |
| Canned cycle for drilling                   | Mill, MS, Y, SY, LF-Mill, TTMS, TTSY               |
| Spindle orientation expansion               | MS, SY TTS, TTMS, TTSY                             |
| Spindle synchronous control                 | MS, SY TTS, TTMS, TTSY                             |
| Torque control                              | MS, SY TTS, TTMS, TTSY                             |
| Y axis offset                               | Y, SY, TTSY                                        |
| Arbitrary angular control                   | Y, SY, TTSY                                        |
| Composite / Superimposed control            | MS, SY, TTS, TTMS, TTSY                            |
| Balance cutting                             | TTS, TTMS, TTSY                                    |
| Option                                      |                                                    |
| Fast ethernet                               | Needed option board                                |
| Data server                                 | Needed option board                                |
| Protection of data at 8 levels              |                                                    |
| Tool offset pairs                           | 200 pairs                                          |
| Helical interpolation                       |                                                    |
| Look-ahead Block                            | 40 ea, 200 ea (AICC II)                            |

Figures in inch are converted from metric values.

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

# CONTROLLER

## SIEMENS 828D

[ ] : Option ☆ Needed technical consultation

| Controlled axis / Display / Accuracy Compensation |                                                                           |
|---------------------------------------------------|---------------------------------------------------------------------------|
| Control axis                                      | 2 axis (X, Z) - Std.                                                      |
|                                                   | 3 axis (X, Z, C) - Mill                                                   |
|                                                   | 4 axis (X, Z, Y, C) - Y                                                   |
|                                                   | 5 axis (X, Z, B, C, A) - MS                                               |
|                                                   | 6 axis (X, Z, Y, B, C, A) - SY                                            |
| Simultaneously controlled axis                    | Max. 4 axis                                                               |
| Least setting Unit                                | X, Z, Y, B axis : 0.001 mm (0.0001 inch)<br>C, A axis : 1 deg [0.001] deg |
| Least input increment                             | X, Z, Y, B axis : 0.001 mm (0.0001 inch)<br>C, A axis : 1 deg [0.001] deg |
| Inch / Metric changeover                          | G70 (inch) / G71 (metric)                                                 |
| Interlock                                         | All axis / Each axis                                                      |
| Backlash compensation                             |                                                                           |
| Pitch error compensation                          | Leadscrew pitch error compensation                                        |
| LCD / MDI                                         | 15 inch color LCD (With Touch panel)                                      |
| Keyboard                                          | QWERTY full keyboard                                                      |
| Stored stroke check                               | Over travel                                                               |
| Operation                                         |                                                                           |
| Automatic operation                               |                                                                           |
| MDI operation                                     |                                                                           |
| Program restart                                   |                                                                           |
| Program check function                            | Dry run / Program check / Machine lock                                    |
| Single block                                      |                                                                           |
| Block search                                      | Block search                                                              |
| Reposition                                        |                                                                           |
| Working area limit                                | Working area limitations                                                  |
| Interpolation functions                           |                                                                           |
| Positioning                                       | G00                                                                       |
| Linear interpolation                              | G01                                                                       |
| Circular interpolation                            | Circular interpolation CW (G02)                                           |
|                                                   | Circular interpolation CCW (G03)                                          |
| Exact position stop                               | Single block exact stop (G09)                                             |
|                                                   | Exact stop G60 (G601, G602, G603)                                         |
| Dwell                                             | Dwell (G04)                                                               |
| Reference position return                         | Return to reference point                                                 |
|                                                   | Return to 2nd reference point                                             |
| Helical interpolation                             |                                                                           |
| Thread synchronous cutting                        |                                                                           |
| Thread cutting retract                            |                                                                           |
| Spline interpolation                              | Non-uniform rational B splines                                            |
| Feed function / Acc. & Dec. control               |                                                                           |
| Manual feed                                       | Rapid traverse                                                            |
|                                                   | Jog                                                                       |
|                                                   | Manual handle                                                             |
|                                                   | Reference position return                                                 |
| Cutting feed command                              | Direct input F code                                                       |
| Feedrate override                                 | 0 ~ 200% (10% Unit)                                                       |
| Rapid traverse override                           | 1%, 25%, 50%, 100%                                                        |
| Feed per minute                                   | G94                                                                       |
| Feed per revolution                               | G95                                                                       |
| Look-ahead block                                  | 1 block                                                                   |
| Program input                                     |                                                                           |
| ISO support                                       | G291 (ISO)/G290 (SIEMENS)                                                 |
|                                                   | (ISO G Code system-A)                                                     |
| Optional block skip                               | 2                                                                         |
| Program stop / end                                | M00, M01 / M02, M30                                                       |
| Maximum command unit                              | ± 999,999.999 mm, ± 99,999.9999 inch                                      |
| Plane selection                                   | X-Y : G17, X-Z : G18, Y-Z : G19                                           |
|                                                   | G54 ~ G57, G505~G549                                                      |
| Workpiece coordinate system                       | G500 (Basic frame - setable zero offset)                                  |
|                                                   | G53 (Work offset non modal)                                               |
|                                                   | G153 (basic frame non modal)                                              |
| Sub program call                                  | 11 folds nested                                                           |
| G code preventing buffering                       | STOPRE                                                                    |
| Turning cycle                                     | Turning programing (Cycle 93, 94, 95, 97)                                 |
| User cycle                                        |                                                                           |
| 3D simulation                                     |                                                                           |
| Real time simulation                              |                                                                           |
| Shop Turn                                         | Machining step programming for turning                                    |

| Auxiliary function / Spindle speed function |                                                                                                                              |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Auxiliary function                          | M Code 4 digit                                                                                                               |
| Spindle speed function                      | S Code 5 digit                                                                                                               |
| Spindle override                            | 0% ~ 150% (10% Unit)                                                                                                         |
| Spindle orientation                         | SPOS                                                                                                                         |
| Rigid tapping                               |                                                                                                                              |
| Automatic mode interchange                  | Spindle / Axis mode                                                                                                          |
| Constant surface speed control              | G96, G97                                                                                                                     |
| Spindle speed limitation                    | LIMS                                                                                                                         |
| Tool function / Tool compensation           |                                                                                                                              |
| Tool function                               | Tool number & Tool name                                                                                                      |
|                                             | Tool : T + Offset : D                                                                                                        |
| Tool life management                        | 128 ea : Std.                                                                                                                |
|                                             | 256 ea : Mill                                                                                                                |
| Tools in tool list                          | 768 ea : Y, MS, SY                                                                                                           |
|                                             | 256 ea : Std.                                                                                                                |
| Cutting Edges in tool list                  | 512 ea : Mill                                                                                                                |
|                                             | 1,536 ea : Y, MS, SY                                                                                                         |
| Tool nose radius compensation               | ISO (G40, G41, G42)                                                                                                          |
| Geometry / Wear compensation                |                                                                                                                              |
| Measurement of tool length                  |                                                                                                                              |
| Tool management function                    |                                                                                                                              |
| Editing function                            |                                                                                                                              |
| Part program storage size                   | 3MB - Std.                                                                                                                   |
|                                             | 5MB - Mill                                                                                                                   |
|                                             | 10MB - Y, MS, SY                                                                                                             |
|                                             | 750 ea                                                                                                                       |
| No. of registerable programs                |                                                                                                                              |
| External Storage devices                    | Local network, Server, USB, Flash drive                                                                                      |
| Background editing                          |                                                                                                                              |
| Extended part program editing               | Copy, move and change of NC program                                                                                          |
| Memory card program edit                    |                                                                                                                              |
| Data input / output & Interface             |                                                                                                                              |
| I/O interface                               | CF card interface (ONLY 10.4")                                                                                               |
|                                             | USB memory interface                                                                                                         |
|                                             | Embedded Ethernet memory interface                                                                                           |
| Screenshot                                  |                                                                                                                              |
| Setting, display and diagnosis              |                                                                                                                              |
| Self-diagnosis function                     |                                                                                                                              |
| History display & Operation                 | Alarm & Operator message & Operation                                                                                         |
| Run hour / Parts count display              |                                                                                                                              |
| Maintenance information                     |                                                                                                                              |
| Actual cutting feedrate display             |                                                                                                                              |
| Display of spindle speed / T code           |                                                                                                                              |
| Graphic display                             |                                                                                                                              |
| Operating monitor screen                    | Spindle / Servo load etc.                                                                                                    |
|                                             | Support 9 languages<br>Chinese (Simplified/Traditional), English,<br>French, German, Italian, Korean,<br>Portuguese, Spanish |
| Multi language display                      | [☆ Support 22 languages : Inquiry need]                                                                                      |
|                                             |                                                                                                                              |
| LCD Screen Saver                            | Screen saver & Motion sensing                                                                                                |
| Function for machine type                   |                                                                                                                              |
| Cs contour control (C & A axis)             | Mill, MS, Y, SY model                                                                                                        |
| Polar coordinate interpolation              | Mill, MS, Y, SY model                                                                                                        |
| Cylindrical interpolation                   | Mill, MS, Y, SY model                                                                                                        |
| Canned cycle for drilling                   | Mill, MS, Y, SY model                                                                                                        |
| [Polygon turning (CP-Basic)]                | Mill, MS, Y, SY model                                                                                                        |
| [Hobbing / Skybing (CP-Comfort)]            | Mill, MS, Y, SY model                                                                                                        |
| Spindle synchronous control                 | MS, SY model                                                                                                                 |
| Servo tailstock function                    | MS, SY model                                                                                                                 |
| Option                                      |                                                                                                                              |
| Additional optional block skip              | 10                                                                                                                           |
| Contour handwheel                           |                                                                                                                              |

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