

# LM

# 2200TT Seires

LM2200TTSY | LM2200TTSYC

WIA Machine Tools CNC Multi Axis Turning Center

# Technical Leader

The CNC Turning Center **LM2200TT series**, designed by WIA machine tools with years of expertise and the latest technology, is designed to maximize productivity by utilizing twin spindles and twin turrets.

| LM2200TTSYY            |        | LM2200TTSYYC                                                                               |
|------------------------|--------|--------------------------------------------------------------------------------------------|
| Max. Turning Dia.      | mm(in) | Upper : Ø230 (Ø9.1") / Lower : Ø230 (Ø9.1")                                                |
| Max. Turning Length    | mm(in) | 230 (9.1") <1st, 2nd Sp. Separate Workpiece Chucking>                                      |
|                        |        | 673 (26.5") <1st, 2nd Sp. Synchronized>                                                    |
| Chuck Size             | inch   | 1st : 8" 2nd : 8"                                                                          |
| Bar Capacity           | mm(in) | 1st : Ø65 (Ø2.6") 2nd : Ø65 (Ø2.6")                                                        |
| Spindle Speed          | r/min  | 4,500                                                                                      |
| Sp. Power (Max./Cont.) | kW(HP) | 18.5/15 (25/20)                                                                            |
| No. of Tools           | EA     | 2×24                                                                                       |
| Travel                 | mm(in) | X1/Y1/Z1/X2/Y2/Z2/ZB : 165/100/700/165/100/700/730 (6.5"/3.9"/27.6"/6.5"/3.9"/27.6"/28.7") |
| Rapid Traverse Rate    | m/min  | X1/Y1/Z1/X2/Y2/Z2/ZB : 20/10/36/20/10/36/36                                                |

[ ] : Option

# LM

## 2200TT Seires

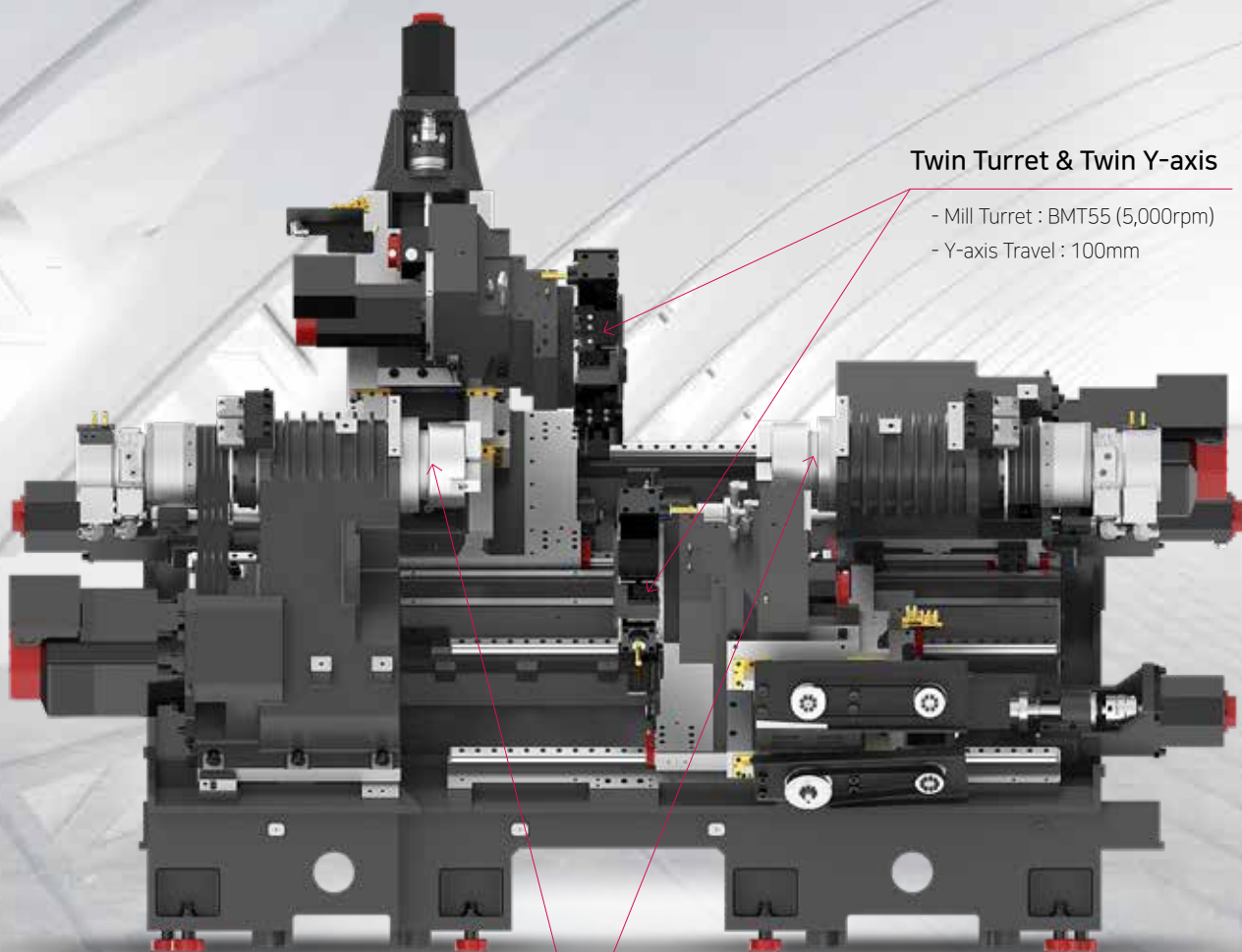
Twin spindle, Twin turret, Twin Y-axis, Multitasking

- Complex machining ability enhanced through upper/lower twin turret & twin Y-axis structure
- Front & rear surface machining with twin spindle
- Hybrid travel structure with box guide & roller LM guide combination
- Diverse work piece size coverage with 8" & 10" spindle configuration
- High performance latest FANUC control applied



# 01 BASIC STRUCTURE

Twin Spindle and Turret for High Productivity - Multitasking CNC Turning Center

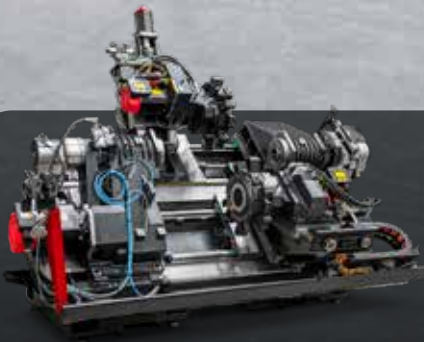


## Twin Turret & Twin Y-axis

- Mill Turret : BMT55 (5,000rpm)
- Y-axis Travel : 100mm

## Twin Spindle

- LM2200TTSYY - 8" : 4,500 [5,000] rpm
- LM2200TTSYYC - 10" : 3,500 [3,500] rpm
- C-Axis Control : 0.001°



## High Precision, High Rigidity Bed Structure

The LM2200TT series features a one-piece 45° slant bed design based on FEM analysis to provide improvement in vibration absorption and thermal displacement. This unique design ensures stable and precise processing.

# REDUCTION OF NON-CUTTING TIME BY FAST RAPID SPEED

## GUIDEWAY

### Hybrid Slideway

Each axis on the LM2200TTSYY is designed with slideways that optimize the characteristics of the axis. For the X/Y-axis, box guideways are used to endure heavy load.

For the Z-axis, roller type LM guideways are used to optimize feed capability.

### Ball Screw

In order to eliminate thermal growth and increase accuracy, all axis are driven by high precision double anchored ballscrews.

Box Guide

Roller LM Guide

### Rapid Traverse Rate (X1/Y1/Z1/X2/Y2/Z2/ZB)

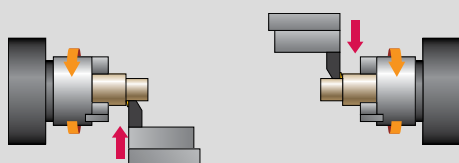
**20/10/36/20/10/36/36** m/min (787/394/1,417/787/394/1,417/1,417 ipm)

### Travel (X1/Y1/Z1/X2/Y2/Z2/ZB)

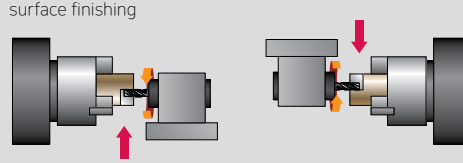
**165/100{±50}/700/165/100{±50}/700/730** mm  
(6.5"/3.9"{±2"}/27.6"/6.5"/3.9"{±2"}/27.6"/28.7")

### Advantages of X/Y-axis Box Guide Application

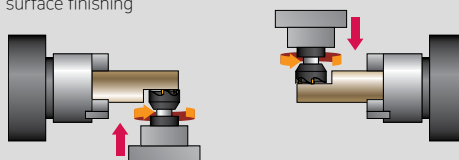
- X-axis face cutting feed increase & enhanced surface finishing



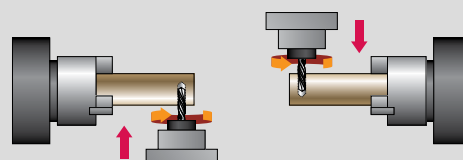
- X/Y-axis milling cutting feed increase & enhanced milling surface finishing



- X/Y-axis face milling cutting feed increase & enhanced milling surface finishing



- X/Y-axis drilling & tapping ability enhanced



# COMPLEX MACHINING

### Multitasking (Turning, Milling Y-Axis Machining)

[illegible]

# MACHINING PROCESS WITH ONLY ONE INITIAL SETTING

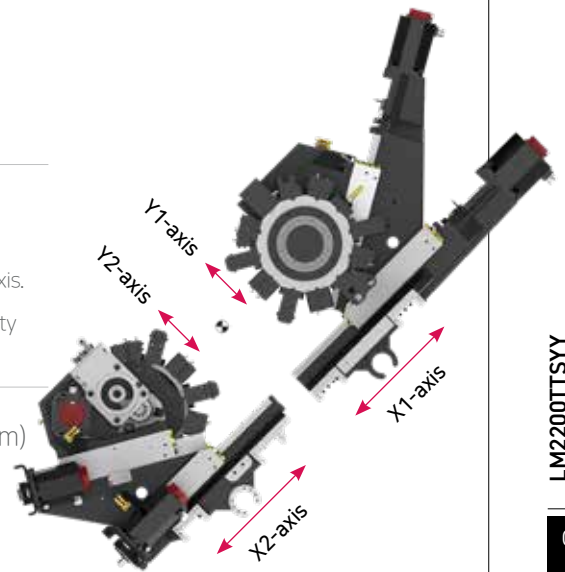
## Y-AXIS

### Wedge Type Y-Axis Structure

The LM2200TT series is designed with a wedge type Y-axis that is transferred by the simultaneous operation of the Ys-axis and the X-axis.

In addition, excellent rigidity makes it possible to perform superb quality during heavy-duty cutting.

- Y1/Y2-axis Rapid Traverse Rate : 10 m/min (394 ipm)
- Y1/Y2-axis Travel : 100 ( $\pm 50$ ) mm (3.9" { $\pm 2$ "})

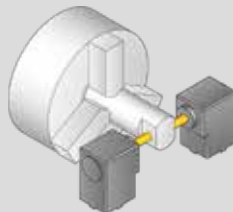


## UPPER/LOWER TWIN Y-AXIS STRUCTURE

Compared to previous upper Y-axis only multi tasking machine, LM2200TT series is equipped with lower Y-axis which enhances Y-axis complex machining abilities.

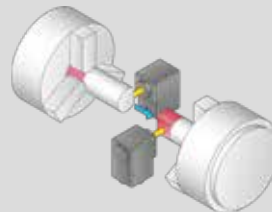
### Advantages of Lower Y-axis Application

- Upper/lower Y-axis turret usage > Cycle time decrease



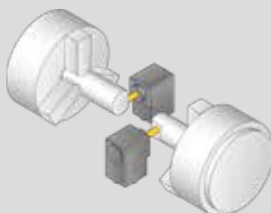
Vibration decrease through simultaneous machining

- Work piece rear side Y-axis machining possible



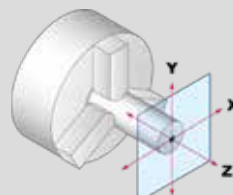
Complex work piece machining

- Two units of Y-axis work piece machining simultaneously



Productivity doubled

- Lower turret zero point setting



Convenience enhanced

# 03 HIGH PRECISION SPINDLE

High-performance Spindle for Powerful Cutting and Precision

## Spindle Specifications

[ ]: Option

| Model                            | Spindle Speed | Motor (Max./Cont.)        | Torque (Max.)             | Chuck Size |
|----------------------------------|---------------|---------------------------|---------------------------|------------|
| LM2200TTSYY<br>(1st/2nd Spindle) | 4,500 rpm     | 18.5/15 kW (25/20 HP)     | 206 N·m (151.9 lbft·ft)   | 8"         |
|                                  | [5,000 rpm]   | [25/15 kW (33.5/20 HP)]   | [223 N·m (164.5 lbft·ft)] |            |
| LM2200TTSYYC<br>(1st Spindle)    | 3,500 rpm     | 18.5/15 kW (25/20 HP)     | 286 N·m (210.9 lbft·ft)   | 10"        |
|                                  | [3,500 rpm]   | [22/18.5 kW (29.5/25 HP)] | [244 N·m (180 lbft·ft)]   |            |
| LM2200TTSYYC<br>(2nd Spindle)    | 4,500 rpm     | 18.5/15 kW (25/20 HP)     | 206 N·m (151.9 lbft·ft)   | 8"         |
|                                  | [5,000 rpm]   | [25/15 kW (33.5/20 HP)]   | [223 N·m (164.5 lbft·ft)] |            |

# HIGH CUTTING PERFORMANCE & ACCURACY

## SPINDLE

### High Performance Twin Spindle

LM2200TT series spindle adopts the same bearing structure as large turning centers, combination of double cylindrical roller bearing & angular contact bearing, which provides heavy duty high performance.

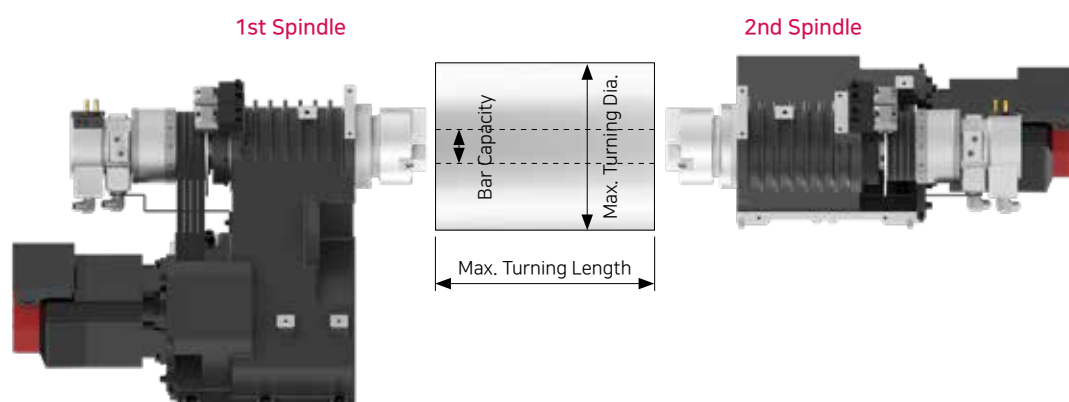


### 2nd Spindle

2nd spindle can perform secondary operations with a single setup, increasing flexibility and productivity.

### C-Axis Control

C-axis of LM2200TT series can be controlled to 0.001° which makes it possible to process various shapes.



| Item                |        | LM2200TTSYY                                           |             | LM2200TTSYYC                          |             |
|---------------------|--------|-------------------------------------------------------|-------------|---------------------------------------|-------------|
|                     |        | 1st Spindle                                           | 2nd Spindle | 1st Spindle                           | 2nd Spindle |
| Spindle Type        | -      | Belt                                                  |             |                                       |             |
| Max. Turning Dia.   | mm(in) | Ø230 (Ø9.1")                                          |             |                                       |             |
| Max. Turning Length | mm(in) | 230 (9.1") <1st, 2nd Sp. Separate Workpiece Chucking> |             |                                       |             |
|                     |        | 673 (26.5") <1st, 2nd Sp. Synchronized>               |             | 660 (26") <1st, 2nd Sp. Synchronized> |             |
| Chuck Size          | inch   | 8"                                                    |             | 10"                                   | 8"          |
| Bar Capacity        | mm(in) | Ø65 (Ø2.6")                                           |             | Ø81 (Ø3.2")                           | Ø65 (Ø2.6") |

# 04 BMT TURRET

High speed, High Accuracy, Highly Reliable Servo Type Turret

## Mill Turret Specifications

[ ] : Option

| Type                        | Speed       | Motor (Max./Cont)      | Torque (Max./Cont)                 | Collet Size |
|-----------------------------|-------------|------------------------|------------------------------------|-------------|
| BMT55<br>(12 [24] Position) | 5,000 rpm   | 5.5/3.7 kW (7.5/5 HP)  | 52.5/26.5 N·m (38.7/19.5 lbf·ft)   | Ø16 (Ø5/8") |
|                             | [5,000 rpm] | [7.5/1.5 kW (10/2 HP)] | [47.7/16.9 N·m (35.2/12.5 lbf·ft)] | <ER25>      |

# BMT TURRET WITH POWERFUL CUTTING

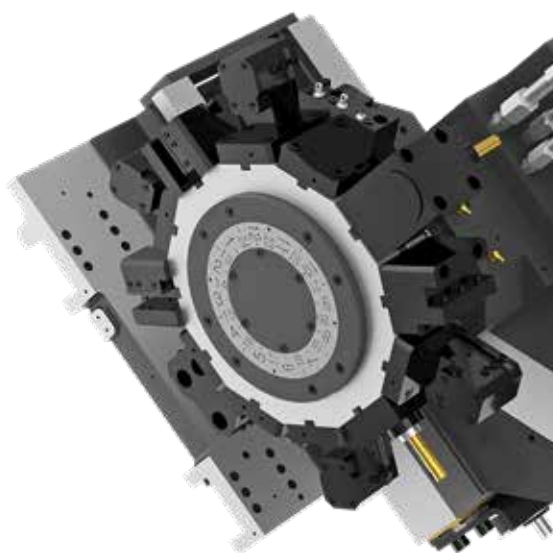
## TURRET

### Mill Turret

The upper and the lower turrets are equipped with powerful servo motors, which guarantee high productivity and precision.

In particular, a total of 24 (Option 48) tools can be installed on both turrets, and high speed precision machining of complex products is possible with a single setup.

- ◎ Speed (rpm) : 5,000 r/min
- ◎ Collet size :  $\varnothing 16$  ( $\varnothing 5/8$ " ) {ER25}
- ◎ Indexing Time : 0.15 sec



STRAIGHT MILLING HEAD



ANGULAR MILLING HEAD



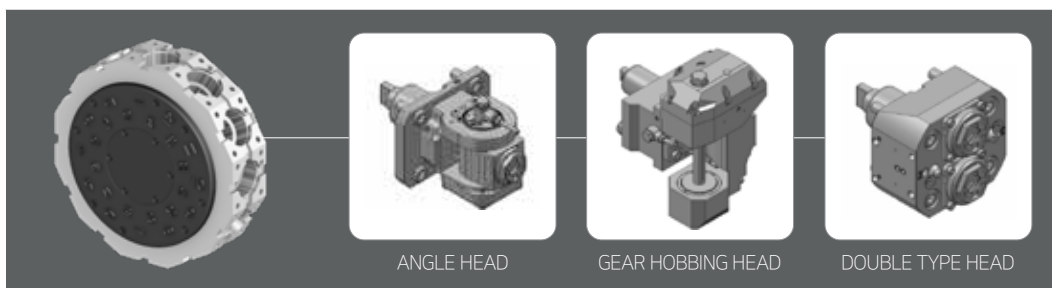
### Mill Tool Holder

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**

With the Y-axis, the LM2200TT 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.



ANGLE HEAD

GEAR HOBBING HEAD

DOUBLE TYPE HEAD

※ Consultation needed when ordering these options.

# 05 FANUC - SMART PLUS

The Compatible All-round Control

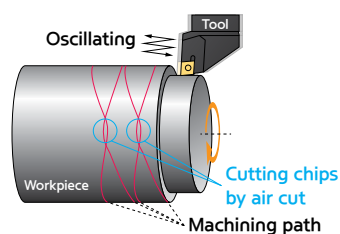


## 15" Touch-type Monitor as a standard

|                              |                                |
|------------------------------|--------------------------------|
| Smart Machine Control        | Fast Cycle Time Technology     |
| Conversational Program       | Fine Surface Technology        |
| i-HMI                        | Smart Servo Control Technology |
| Part Program Storage         | SmartGuide-i                   |
| No. of Registerable Programs | Machining-aid Function         |
|                              | 5120M (2MB)                    |
|                              | 1000 EA                        |

## Servo Learning Oscillation Function for Chip Breaking **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.

# 06 USER CONVENIENCE

Various Devices for User Friendly

## HIGH PRECISION SYSTEM



### Automatic Q-Setter **OPTION**

Cutting tools are calibrated quickly and accurately with the addition of a q-setter. Each tool tip is touched off manually using a sensor that inputs the position automatically.



### Linear Scale **OPTION**

Linear scales increase positioning accuracy and reduce distortion caused by thermal growth, thus ensuring a more accurate finished part. (LM1600/1800 Series)



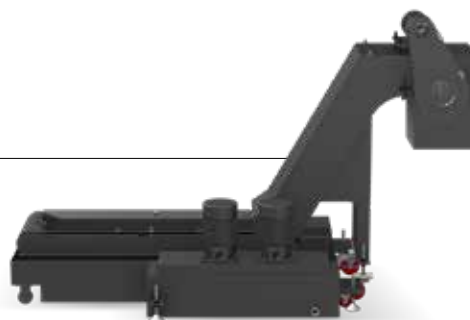
### Work Probe **OPTION**

Workpiece coordinate values can be set automatically using the optional spindle probe.

## CHIP DISPOSAL SOLUTION

### Chip Conveyor

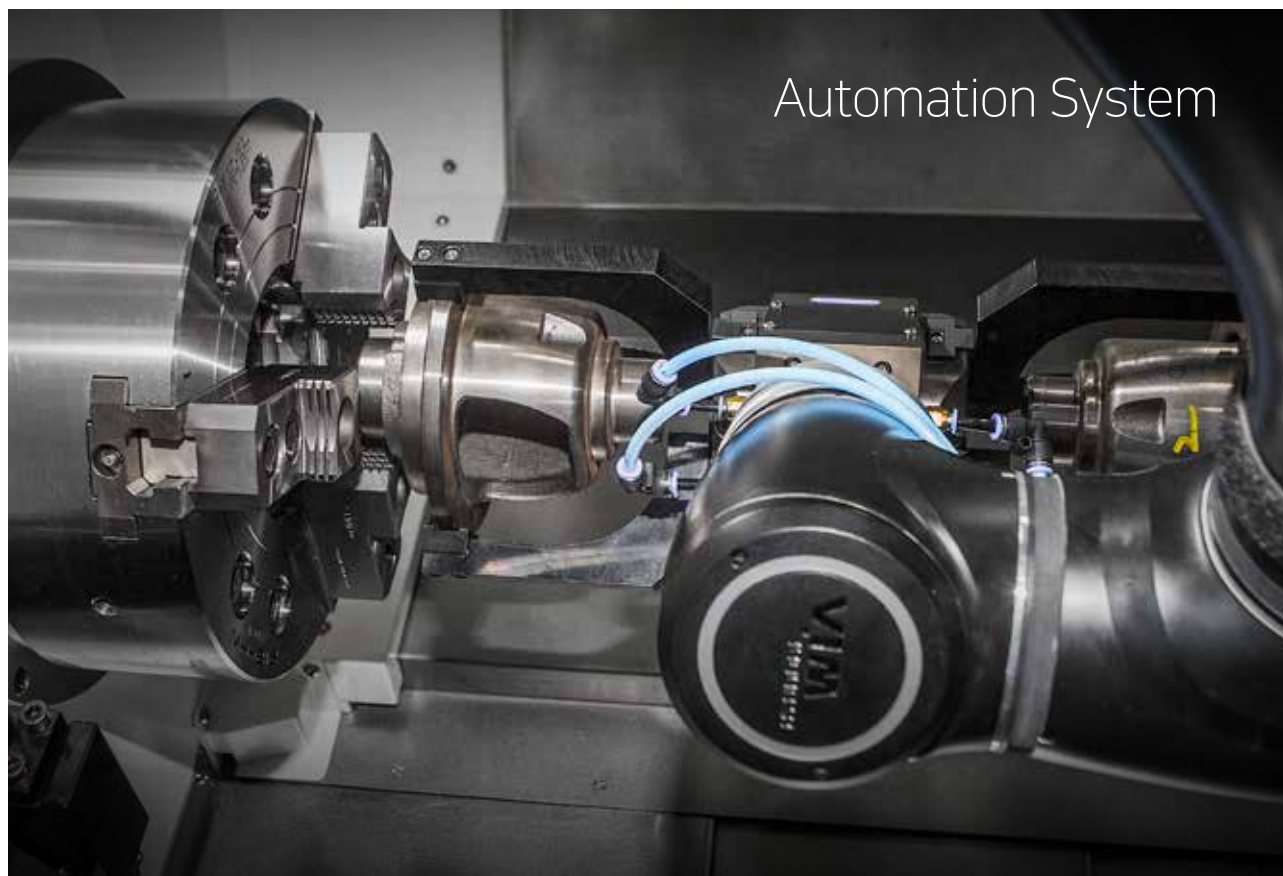
Timely and effective disposal of chips will enhance productivity as well as the working environment.



|               |                                                                                     |                                  |                       |
|---------------|-------------------------------------------------------------------------------------|----------------------------------|-----------------------|
| Hinge         | Chip Type : Roughing Chip, Long Chip, Chip complex                                  | Material : SS41, 45C, Cast Steel | Front-Right 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 wia's sales person.

Optional



## Automation System

LM2200TTSYY  
Multi Axis Turning Center

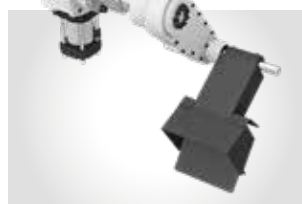
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### Robot System

With its know-how and experience, WIA machine tools is globally recognized in the field of automation. Robot automation features flexible responsive-ness, convenience and maintenance regardless of type for automation construction.

### Bar Feeder System

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.

# SPECIFICATIONS

## Standard & Optional

| Spindle                                           |                                | LM2200TTSYY | LM2200TTSYYC |
|---------------------------------------------------|--------------------------------|-------------|--------------|
| 1st Spindle<br>Hollow Chuck 3 Jaw                 | 8"                             | ●           | -            |
|                                                   | 10"                            | -           | ●            |
|                                                   | Chuck No                       | ○           | ○            |
| 2nd Spindle<br>Hollow Chuck 3 Jaw                 | 8"                             | ●           | ●            |
|                                                   | No Chuck                       | ○           | ○            |
| Standard Soft Jaw (1set)                          |                                | ●           | ●            |
| Chuck Clamp Foot Switch                           |                                | ●           | ●            |
| 2 Steps Hyd. Pressure Device                      |                                | ○           | ○            |
| Spindle Inside Stopper                            |                                | ○           | ○            |
| Cs-Axis (0.001")                                  |                                | ●           | ●            |
| <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                                    |                                | ●           | ●            |
| U-Drill CAP                                       |                                | ●           | ●            |
| Angle Head                                        |                                | ☆           | ☆            |
| Adapter Set                                       |                                | ○           | ○            |
| <b>Tail Stock &amp; Steady Rest</b>               |                                |             |              |
| Built in Programmable Tail Stock                  |                                | -           | -            |
| Manual Hyd. Steady Rest                           |                                | -           | -            |
| <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)                      |                                | ●           | ●            |
| 2nd Spindle Air Blow                              |                                | ●           | ●            |
| Turret Air Blow                                   |                                | ☆           | ☆            |
| Air Gun                                           |                                | ○           | ○            |
| Through Spindle Air Blow (Only for Special Chuck) |                                | ☆           | ☆            |
| High Pressure Coolant                             | 0.5Bar (7.2psi)                | ●           | ●            |
|                                                   | 6Bar (87psi)                   | ○           | ○            |
|                                                   | 20Bar (290psi)                 | ○           | ○            |
|                                                   | 70Bar (1,015psi)               | ○           | ○            |
| Power Coolant System (For Automation)             |                                | ☆           | ☆            |
| Coolant Chiller                                   |                                | -           | -            |
| <b>Chip Disposal</b>                              |                                |             |              |
| Coolant Tank                                      | 320 ℓ (84.5 gal)-Side          | ●           | ●            |
|                                                   | 320 ℓ (84.5 gal)-Rear          | ○           | ○            |
| Chip Conveyor (Hinge/Scraper)                     | Front (Rear)                   | ○           | ○            |
|                                                   | Front (Right)                  | ○           | ○            |
| Special Chip Conveyor (Drum Filter)               |                                | -           | -            |
| Chip Wagon                                        | Standard (180 ℓ [47.5 gal])    | ○           | ○            |
|                                                   | Swing (200 ℓ [52.8 gal])       | ○           | ○            |
|                                                   | Large Swing (290 ℓ [76.6 gal]) | ○           | ○            |
|                                                   | Large Size (330 ℓ [87.2 gal])  | ○           | ○            |
|                                                   | Customized                     | ☆           | ☆            |
| <b>Safety Device</b>                              |                                |             |              |
| Back Spin Torque Limiter (BST)                    |                                | ●           | ●            |
| Total Splash Guard                                |                                | ●           | ●            |
| Chuck Hydraulic Pressure Maintenance Interlock    |                                | ☆           | ☆            |

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

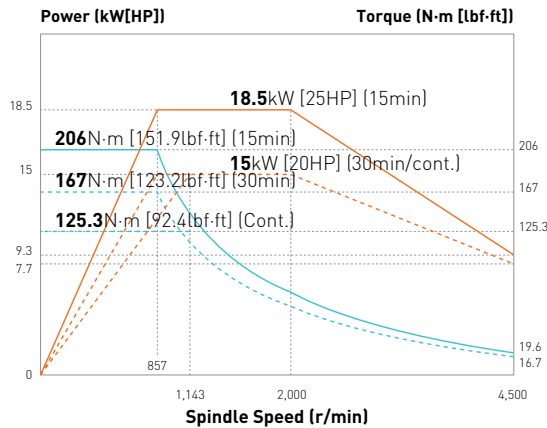
| Electric Device                                         |                                   | LM2200TTSYY | LM2200TTSYYC |
|---------------------------------------------------------|-----------------------------------|-------------|--------------|
| Call Light                                              | 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                                |                                   | ○           | ○            |
| Transformer                                             | 50KVA                             | ○           | -            |
| Auto Power Off)                                         |                                   | ○           | ○            |
| <b>Measurement</b>                                      |                                   |             |              |
| Q-Setter                                                |                                   | -           | -            |
| Automatic Q-Setter                                      |                                   | ○           | ○            |
| Work Close Confirmation Device (Only for Special Chuck) | TACO                              | ○           | ○            |
|                                                         | SMC                               | ○           | ○            |
| Work Setter                                             |                                   | ☆           | ☆            |
| HWTM (Tool Monitoring System)                           |                                   | ○           | ○            |
| Linear Scale                                            | X Axis                            | ○           | ○            |
|                                                         | Z Axis                            | ○           | ○            |
|                                                         | X&Y Axis                          | ○           | ○            |
| Coolant Level Sensor(Only for Chip Conveyor)            |                                   | ☆           | ☆            |
| <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                                              |                                   | ☆           | ☆            |
| 2nd Sp. Work Eject (Pneumatic Type)                     |                                   | ○           | ○            |
| 2nd Sp. Work Pusher (Spring Type)                       |                                   | ○           | ○            |
| Extra M-Code 4ea                                        |                                   | ○           | ○            |
| Automation Interface                                    |                                   | ☆           | ☆            |
| I/O Extension (IN & OUT)                                | 16 Contact                        | ○           | ○            |
|                                                         | 32 Contact                        | ○           | ○            |
| Parts Catcher                                           | 1st Sp.                           | ○           | ○            |
|                                                         | 2nd Sp.                           | -           | -            |
| Parts Unloader (2nd Sp.) + Parts Conveyor               |                                   | ○           | ○            |
| Turret Work Pusher (For Automation)                     |                                   | ☆           | ☆            |
| Parts Conveyor                                          |                                   | ○           | ○            |
| <b>Hyd. Device</b>                                      |                                   |             |              |
| Standard Hyd. Cylinder                                  | Hollow                            | ●           | ●            |
| Standard Hyd. Unit                                      | 35bar (507.6psi) / 24 ℓ (6.3 gal) | ●           | ●            |
| <b>S/W</b>                                              |                                   |             |              |
| Dialogue Program (HW-DPRO) : FANUC                      |                                   | -           | -            |
| 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                       |                                   | ○           | ○            |

※ 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.

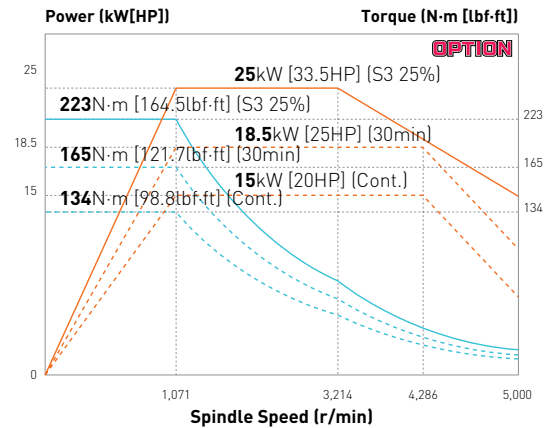
# SPECIFICATIONS

## Spindle Output/Torque Diagram

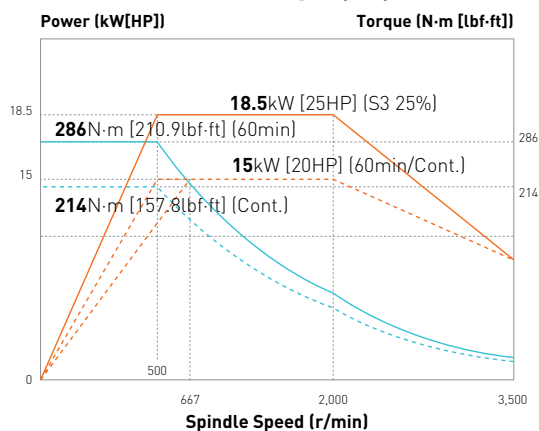
**LM2200TTSYY 4,500rpm (1st, 2nd / C 2nd)**



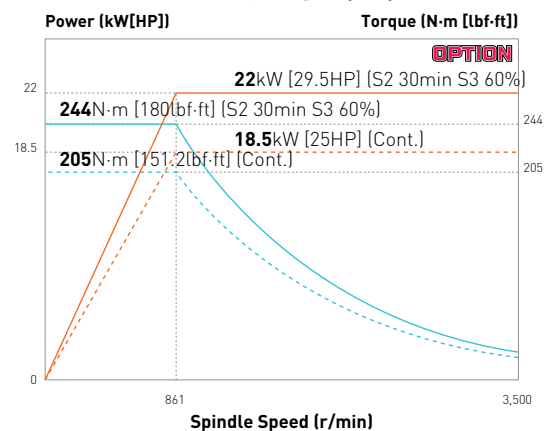
**LM2200TTSYY 5,000rpm (1st, 2nd / C 2nd)**



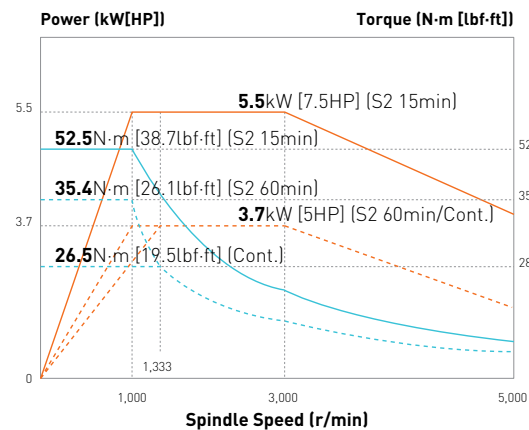
**LM2200TTSYYC 3,500rpm (1st)**



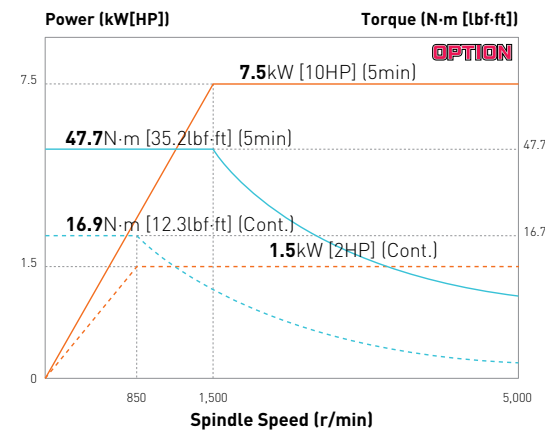
**LM2200TTSYYC 3,500rpm (1st)**



**Mill Turret 5,000rpm**



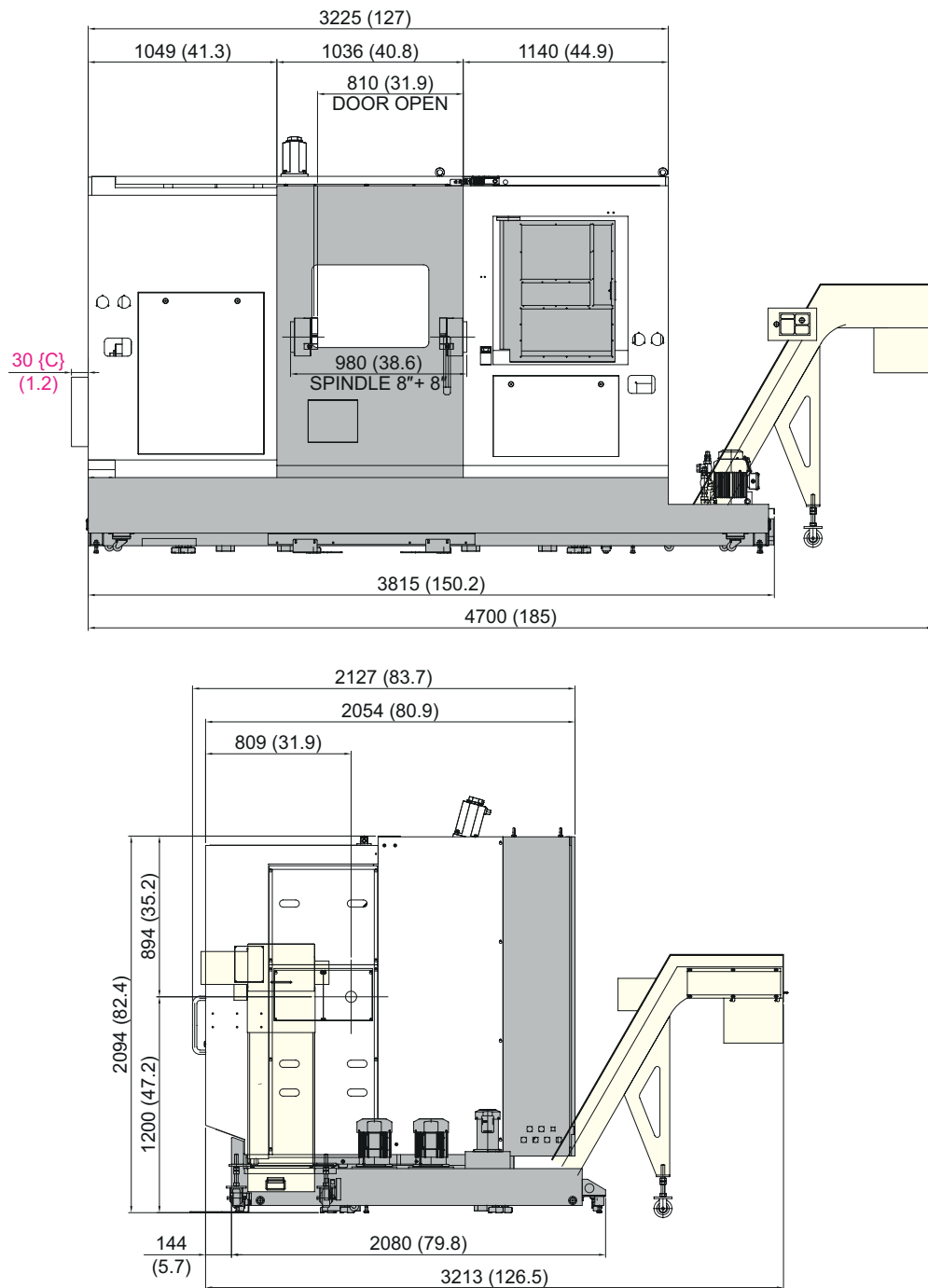
**Mill Turret 5,000rpm**



# SPECIFICATIONS

## External Dimensions

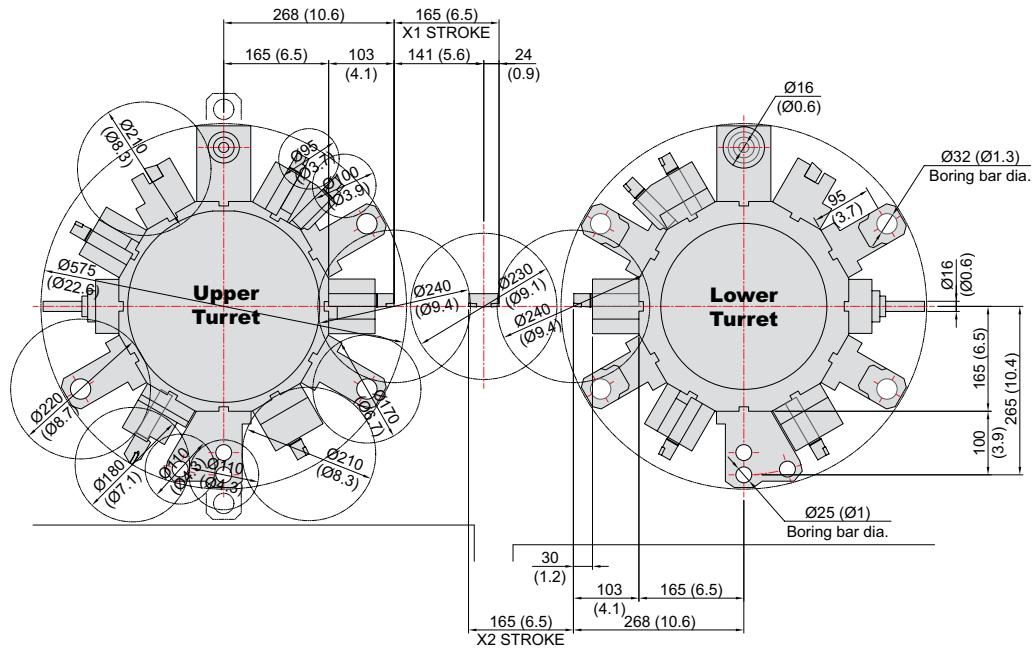
unit : mm(in)



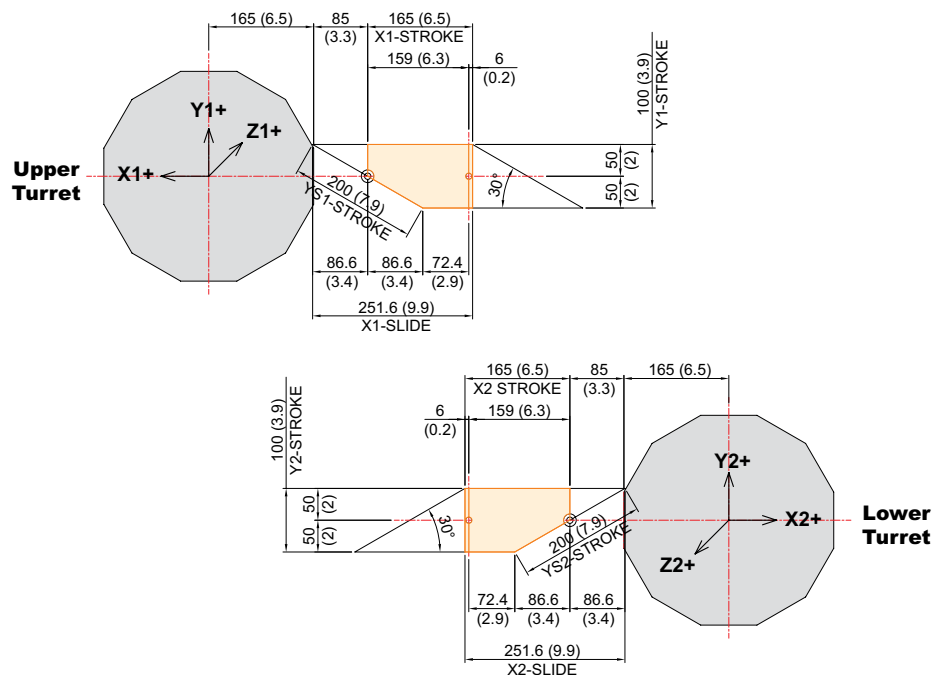
# SPECIFICATIONS

## Interference

unit : mm(in)



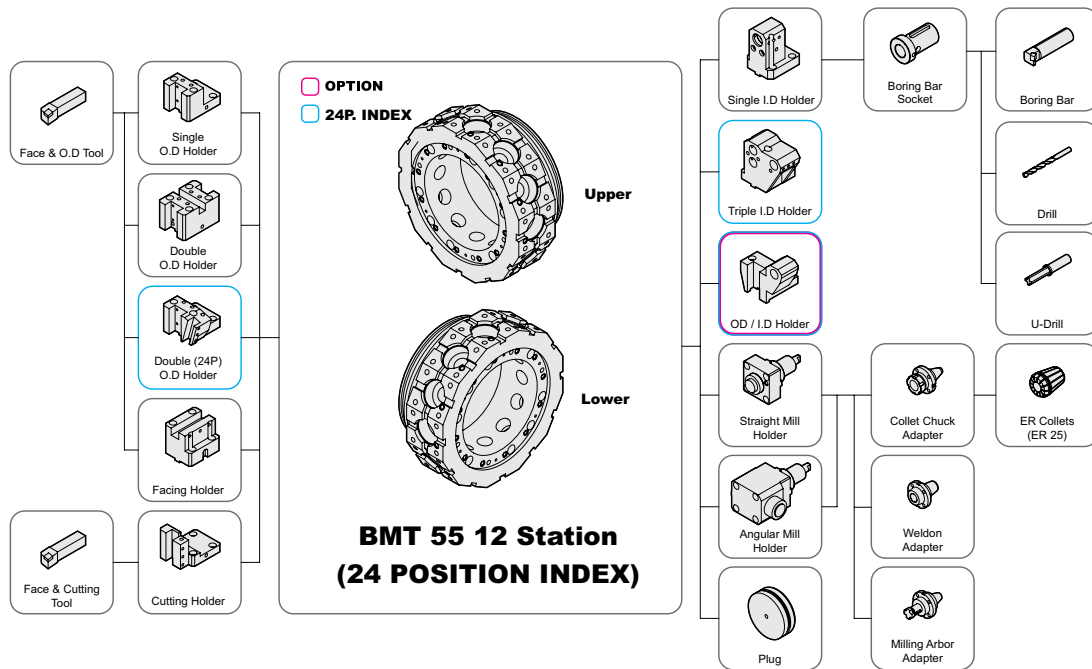
## Y-axis Travel Range



# SPECIFICATIONS

## Tooling System

unit : mm(in)



## Tooling Parts Detail

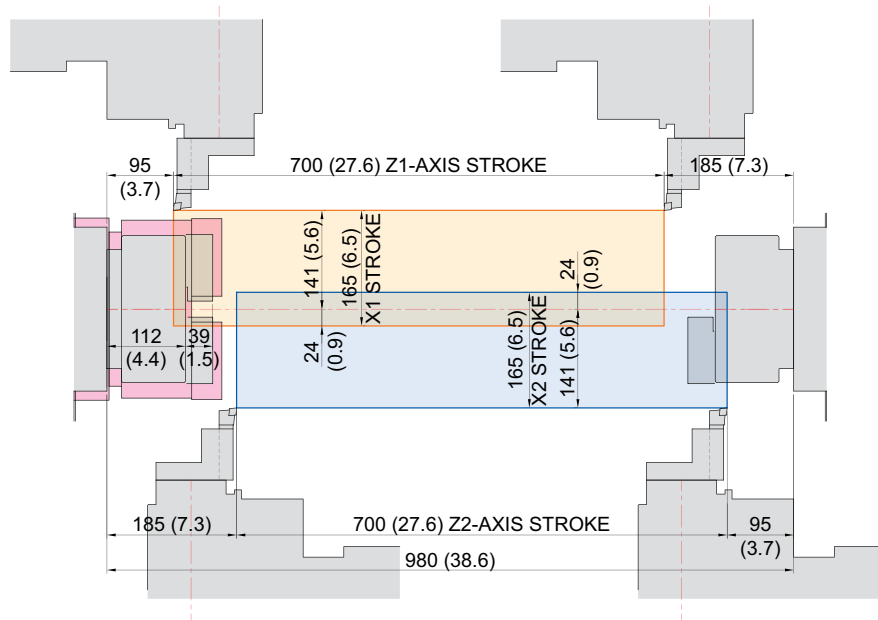
| ITEM           |                      |                            | 12 Stations (24 Positions) |           |
|----------------|----------------------|----------------------------|----------------------------|-----------|
|                |                      |                            | mm Unit                    | inch Unit |
| Turning Holder | O.D Holder           | Right/Left                 | 4                          | 4         |
|                |                      | Double                     | 2                          | 2         |
|                |                      | Double (24P)               | 2                          | 2         |
|                | Facing Holder        |                            | 2                          | 2         |
|                | O.D & I.D Holder     |                            | Opt.                       | Opt.      |
| Boring Holder  | I.D Holder           | Single                     | 7                          | 7         |
|                |                      | Triple                     | 2                          | 2         |
|                | U-Drill Holder       | Cap                        | 7                          | 7         |
| Driven Holder  | Straight Mill Holder | Standard                   | 2                          | 2         |
|                |                      | TTC (Tool through Coolant) | Opt.                       | Opt.      |
|                | Angular Mill Holder  | Standard                   | 2                          | 2         |
|                |                      | TTC (Tool through Coolant) | Opt.                       | Opt.      |
| Socket         | Boring               | Ø8 (Ø5/16")                | 2                          | 2         |
|                |                      | Ø10 (Ø3/8")                | 2                          | 2         |
|                |                      | Ø12 (Ø1/2")                | 2                          | 2         |
|                |                      | Ø16 (Ø5/8")                | 2                          | 2         |
|                |                      | Ø20 (Ø3/4")                | 2                          | 2         |
|                |                      | Ø25 (Ø1")                  | 2                          | 2         |
|                | Drill                | MT 1 × MT 2                | 2                          | 2         |
|                |                      | MT 2                       | 2                          | 2         |
|                |                      | MT 3                       | Opt.                       | Opt.      |
|                | ER Collet            |                            | 1 Set                      | 1 Set     |
|                | Adapter Set          |                            | 1 Set                      | 1 Set     |

# SPECIFICATIONS

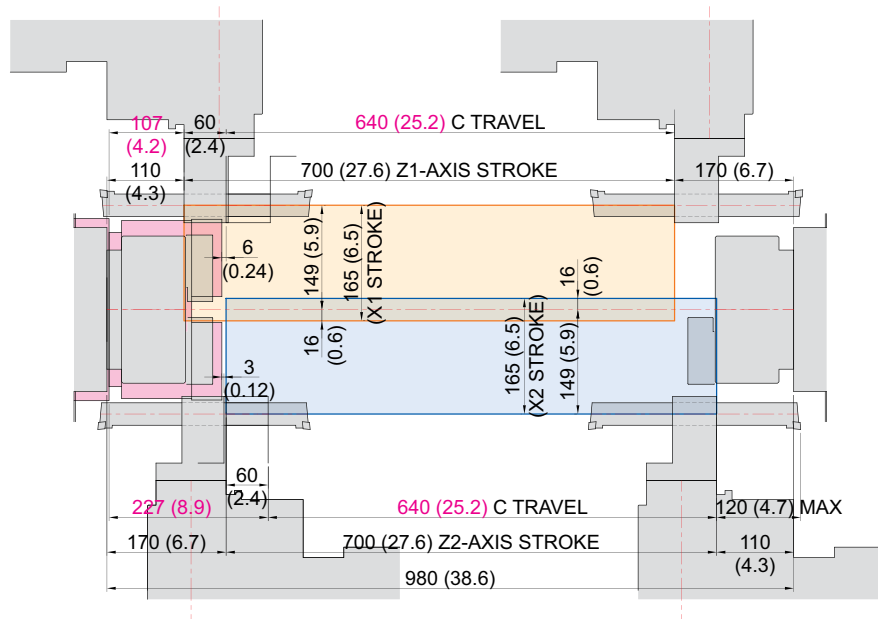
## Tooling Travel Range

unit : mm(in)

### O.D HOLDER



### I.D HOLDER

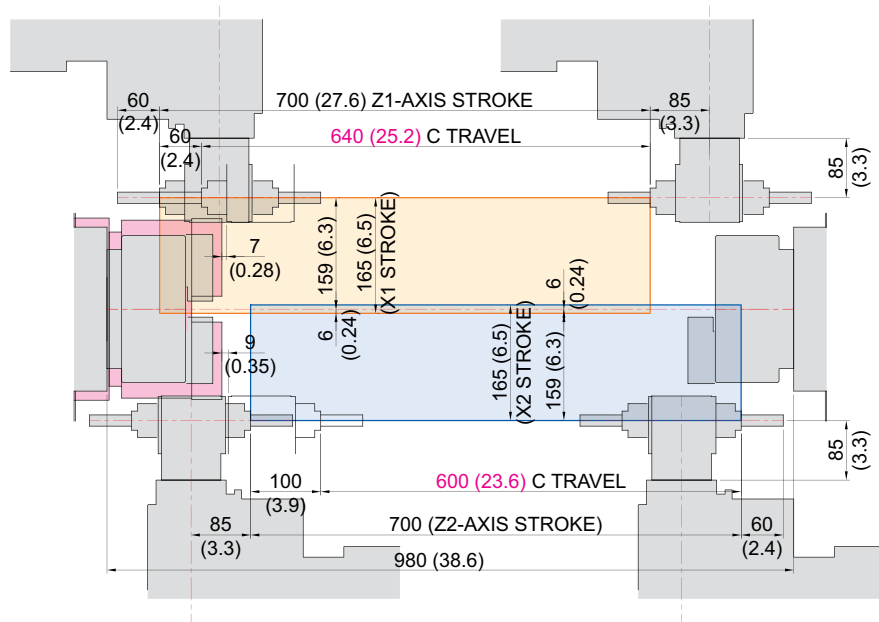


# SPECIFICATIONS

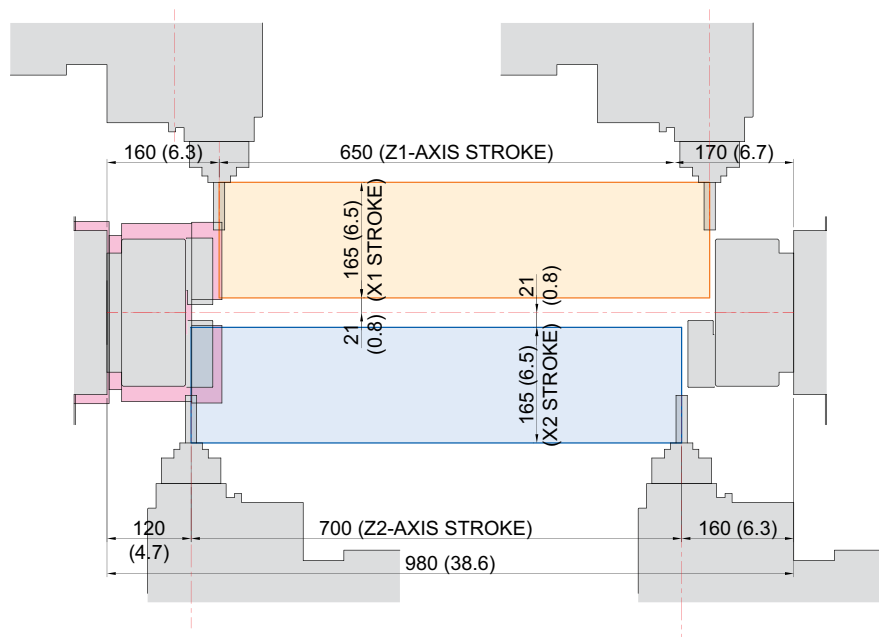
## Tooling Travel Range

unit : mm(in)

### ANGULAR MILL



### STRAIGHT MILL



# SPECIFICATIONS

## Specifications

[    ]: 선택사양

| ITEM          |                          |                 |             | LM2200TTSYY                                                                                   | LM2200TTSYYC                                   |
|---------------|--------------------------|-----------------|-------------|-----------------------------------------------------------------------------------------------|------------------------------------------------|
| CAPACITY      | Max. Turning Dia.        | mm(in)          |             | Ø230 (Ø9.1")                                                                                  |                                                |
|               | Max. Turning Length      | mm(in)          |             | 230 (9.1") <1st, 2nd Sp. Separate Workpiece Chucking>                                         |                                                |
|               | Bar Capacity             | 1st             | mm(in)      | 673 (26.5") <1st, 2nd Sp. Synchronized>                                                       | 660 (26") <1st, 2nd Sp. Synchronized>          |
|               |                          | 2nd             | mm(in)      | Ø65 (Ø2.6")                                                                                   | Ø81 (Ø3.2")                                    |
| SPINDLE       | Chuck Size               | 1st             | mm(in)      | 8"                                                                                            |                                                |
|               |                          | 2nd             | mm(in)      | 8"                                                                                            |                                                |
|               | Spindle Bore             | 1st             | mm(in)      | Ø76 (Ø3")                                                                                     | Ø91 (Ø3.6")                                    |
|               |                          | 2nd             | mm(in)      | Ø76 (Ø3")                                                                                     |                                                |
|               | Spindle Speed (rpm)      | 1st             | r/min       | 4,500 [5,000]                                                                                 | 3,500 [3,500]                                  |
|               |                          | 2nd             | r/min       | 4,500 [5,000]                                                                                 |                                                |
|               | Motor (Max/Cont.)        | 1st             | kW(HP)      | 18.5/15 (25/20) [25/15 (33.5/20)]                                                             | 18.5/15 (25/20) [22/18.5 (29.5/25)]            |
|               |                          | 2nd             | kW(HP)      | 18.5/15 (25/20) [25/15 (33.5/20)]                                                             |                                                |
|               | Torque (Max/Cont.)       | 1st             | N.m(lbf.ft) | 206/125.3 (151.9/62.4)<br>[223/136 (164.5/100.3)]                                             | 286/214 (210.9/157.8)<br>[244/205 (180/151.2)] |
|               |                          | 2nd             | N.m(lbf.ft) | 206/125.3 (151.9/62.4) [223/136 (164.5/100.3)]                                                |                                                |
|               | Spindle Type             | 1st             | -           | BELT                                                                                          |                                                |
|               |                          | 2nd             | -           | BELT                                                                                          |                                                |
|               | Spindle Nose             | 1st             | -           | A2-6                                                                                          | A2-8                                           |
|               |                          | 2nd             | -           | A2-6                                                                                          |                                                |
|               | C-axis Indexing          | deg             |             | 0.001 °                                                                                       |                                                |
| FEED          | Travel                   | mm(in)          |             | X1/Y1/Z1/X2/Y2/Z2/ZB : 165/100/700/165/100/700/730<br>(6.5"/3.9"/27.6"/6.5"/3.9"/27.6"/28.7") |                                                |
|               | Rapid Traverse Rate      | m/min(ipm)      |             | X1/Y1/Z1/X2/Y2/Z2/ZB : 20/10/36/20/10/36/36<br>(787/394/1,417/787/394/1,417/1,417)            |                                                |
|               | Slide Type               | X/Y             | -           | BOX GUIDE                                                                                     |                                                |
| TURRET        | Tool Size                | O.D/I.D         | mm(in)      | BOX GUIDE                                                                                     |                                                |
|               |                          |                 |             | ROLLER LM GUIDE                                                                               |                                                |
|               | No. of Tools             | ea              |             | 2×24                                                                                          |                                                |
|               | Indexing Time            | sec/step        |             | □20 (□0.8")/Ø32 (Ø1.3")                                                                       |                                                |
| LIVE TOOL     | Y-Axis Type              | -               |             | 0.2                                                                                           |                                                |
|               | Motor (Max/Cont.)        | r/min           |             | WEDGE TYPE                                                                                    |                                                |
|               | Milling Tool Speed (rpm) | kW(HP)          |             | 5,000 [5,000]                                                                                 |                                                |
|               | Torque (Max/Cont.)       | N.m(lbf.ft)     |             | 5.5/3.7 (7.5/5) [7.5/1.5 (10/2)]                                                              |                                                |
|               | Collet Size              | mm(in)          |             | 52.5/26.5 (38.7/19.5) [47.7/16.9 (35.2/12.5)]                                                 |                                                |
| TANK CAPACITY | Type                     | -               |             | Ø16 (Ø0.6") {ER25}                                                                            |                                                |
|               |                          |                 |             | BMT55                                                                                         |                                                |
| POWER SUPPLY  | Coolant Tank             | ℓ (gal)         |             | 320 (79.3)                                                                                    |                                                |
|               | Lubricating Tank         | ℓ (gal)         |             | 4 (1.1)                                                                                       |                                                |
| MACHINE       | Electric Power Supply    | kVA             |             | 46                                                                                            |                                                |
|               | Thickness of Power Cable | mm <sup>2</sup> |             | OVER 50                                                                                       |                                                |
|               | Voltage                  | V/Hz            |             | 220/60 (200/50*)                                                                              |                                                |
| NC            | Floor Space (L×W)        | mm(in)          |             | 3,815×2,224 (150.2"×87.6")                                                                    | 3,845×2,224 (151.4"×87.6")                     |
|               | Height                   | mm(in)          |             | 2,094 (82.4")                                                                                 |                                                |
|               | Weight                   | kg(lb)          |             | 9,000 (19,842)                                                                                | 9,000 (19,842)                                 |
| NC            | Controller               | -               |             | FANUC i Series - Smart Plus [FANUC 31i-B Plus]                                                |                                                |

\*) Using 50Hz voltage instead of 60Hz may lower the output of motors. (excluding servo motors and inverter motors)  
Specifications are subject to change without notice for improvement.

# CONTROLLER

## FANUC 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                            | SmartGuide-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

## FANUC 31i-B Plus

[ ]: Option

| Controlled axis / Display / Accuracy Compensation |                                                                                                                             |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Control axis                                      | 4 axis (X, Z, Y, C) / 6 axis (X, Z, Y, B, C, A)<br>7 axis (X1/Z1, X2/Z2, B2, C1/C2)<br>8 axis (X1/Z1, X2/Z2, Y1, B2, C1/C2) |
| Simultaneously controlled axis                    | 2 axis [Max. 4 axis]                                                                                                        |
| Designation of spindle axis                       | 4 axis (1 path), 6 axis (2 path Total)                                                                                      |
| 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<br>(Rapid traverse / Cutting feed)                                                                        |
| Position switch                                   |                                                                                                                             |
| LCD / MDI                                         | 15 inch color LCD                                                                                                           |
| 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, Program check                                                                                                      |
| Single block                                      |                                                                                                                             |
| Search function                                   | Program Number / Sequence Number                                                                                            |
| Interpolation functions                           |                                                                                                                             |
| Nano interpolation                                |                                                                                                                             |
| Positioning                                       | G00                                                                                                                         |
| Linear interpolation                              | G01                                                                                                                         |
| Circular interpolation                            | G02, G03                                                                                                                    |
| Helical interpolation                             |                                                                                                                             |
| 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                        |                                                                                                                             |
| Thread cutting retract                            |                                                                                                                             |
| Variable lead thread cutting                      |                                                                                                                             |
| Multi / Continuous threading                      |                                                                                                                             |
| Feed function / Acc. & Dec. control               |                                                                                                                             |
|                                                   | Rapid traverse                                                                                                              |
| Manual feed                                       | 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                           | F1%, F25%, 50%, F100%                                                                                                       |
| 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 ~ #149, #500 ~ #549                                                                                                    |
| 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                                                                                             |
| Program input                                     |                                                                                                                             |
| Multiple repetitive cycles                        | 1, II                                                                                                                       |
| Canned cycle for turning                          |                                                                                                                             |
| Manual Guide i                                    | Conversational auto program                                                                                                 |
| Auxiliary function / Spindle speed function       |                                                                                                                             |
| Auxiliary function                                | M 4 digit                                                                                                                   |
| Level-up M Code                                   | High speed / Multi / Bypass M code                                                                                          |
| Spindle speed function                            | S 4 digit, Binary output                                                                                                    |
| Spindle override                                  | 0% ~ 150% (10% Unit)                                                                                                        |
| Multi position spindle orientation                | M19                                                                                                                         |
| 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                                 | 200 pairs                                                                                                                   |
| Tool nose radius compensation                     | G40, G41, G42                                                                                                               |
| Geometry / Wear compensation                      |                                                                                                                             |
| Direct input of offset measured B                 |                                                                                                                             |
| Editing function                                  |                                                                                                                             |
| Part program storage size                         | 8M                                                                                                                          |
| No. of registerable programs                      | 1000 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 20 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, TTS                                                                                         |
| 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                                   | MS, SY TTS, TTMS, TTSY                                                                                                      |
| Option                                            |                                                                                                                             |
| Fast ethernet                                     | Needed option board                                                                                                         |
| Data server                                       | Needed option board                                                                                                         |
| Protection of data at 8 levels                    |                                                                                                                             |
| Dynamic graphic display                           |                                                                                                                             |

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

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