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Heavy Duty CNC Turning Center  
**L400 Series**

# Process Concentration Type of Next Generation CNC Turning Center



## Basic Structure

- Bed & Guide Way
- Spindle
- Tail Stock



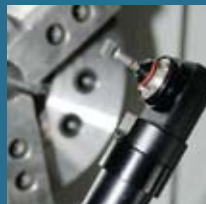
## Turret

- BMT75 Turret
- Mill Tool Holders
- Machining



## Easy to Operate

- HYUNDAI WIA FANUC i Series
- Software



## Option & Convenience

- Auto Q-Setter
- Steady Rest
- Chip Conveyor

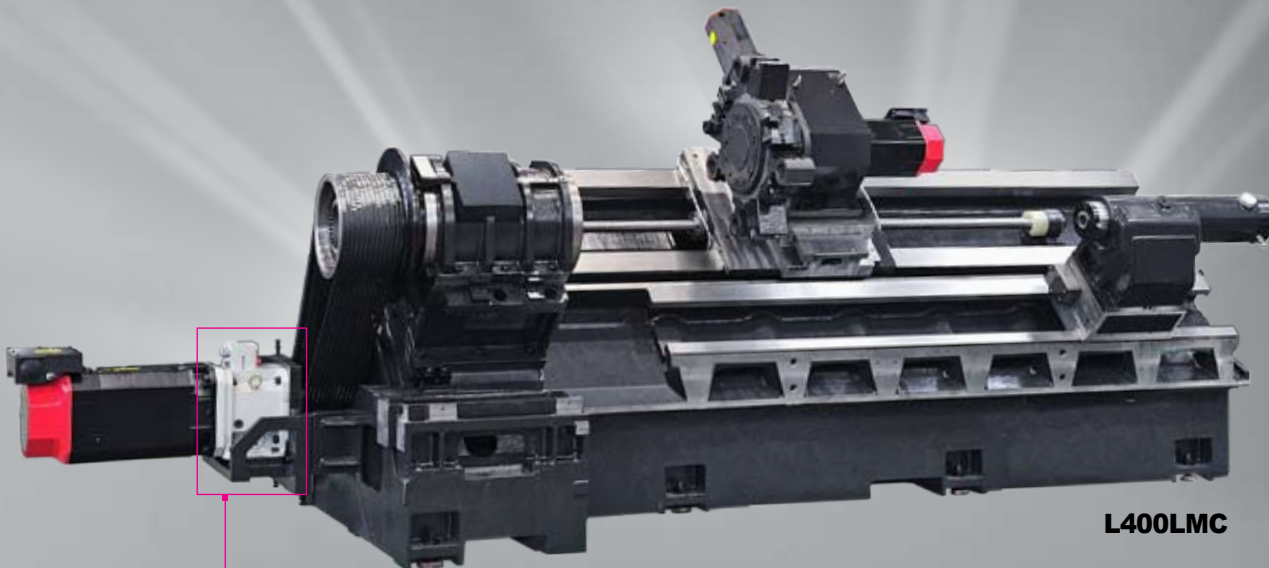
# Large Working Range and Easy Operation Heavy Duty CNC Turning Center **L400 Series**

- Head stock with minimized heat distortion construction
- Adoption of built-in tail stock helps maintaining high accuracy during heavy-duty cutting
- Flexible model variation for customer's demand.



# BASIC STRUCTURE

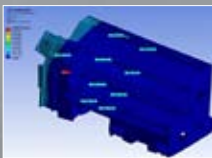
High Rigid Bed & Structure for Heavy Duty Turning Center



**L400LMC**

## 2 Step Gearbox

2 step gearbox enables powerful torque in low speed as well as stable processing in high speed.



## FEM Structure Interpretation

L400 Series bed designed by Finite Element Method (FEM) technique has an integrated bed with 45° gradient applied for powerful cutting and process precision, and well absorbs vibration ensuring stable processing.



## Pre-tensioned & Double Anchored Ball screw

Each axes are designed with a large diameter ball-screw, fixed by double anchors on both ends to provide high rigidity and minimize thermal distortion.

## Forwarding System Thru Servo Motor

Each axis has its ball screw directly connected to a highly reliable digital servo motor, and improves its forwarding precision. Especially, X axis applies all-in-one structure to saddle, which ensures stable feeding capability.



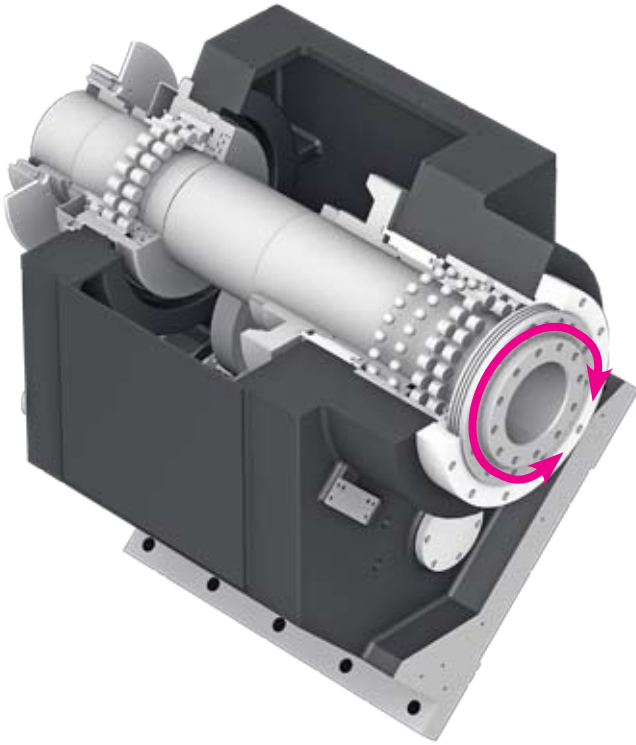
## Box Guide Way for All Axes

L400 Series applies box guide, which shows maximum performance when forwarding middle, large size equipment.

Especially its repeated positioning implements 0.001mm, which ensures excellent accuracy.

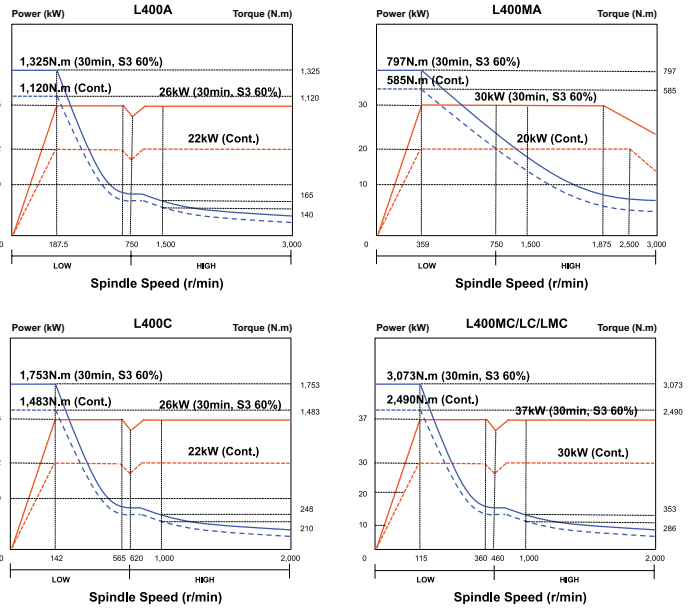


# Spindle



- Spindle table is a deep height of united structure in the left and right symmetric, is designed to maintain high precision for a long continuous operation by basically shutoff the heat with base and anti-heat plate.
- To ensure good safety in the powerful and heavy cutting, was reasonably combined a multi-row of roller bearing and angular bearing in the P4 class.
- Bearing assembly of spindle and head stock are fabricated with high precision, which maintains constant accuracy even in longer period of use.

## Spindle Power & Torque



## C axis Control

L400M series can cut various shapes of works by using C-axis 0.001 degree control function.

| ITEM                | L400A                           | L400MA                   | L400C                    | L400LC                   | L400MC/LMC               |
|---------------------|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Chuck Size          | inch 12"                        | 12"                      | 15"                      | 15"                      | 15"                      |
| Spindle Bore        | mm(in) $\varnothing 104 (4.1")$ | $\varnothing 104 (4.1")$ | $\varnothing 130 (5.1")$ | $\varnothing 130 (5.1")$ | $\varnothing 130 (5.1")$ |
| Spindle Speed (rpm) | r/min 3,000                     | 3,000                    | 2,000                    | 2,000                    | 2,000                    |
| Output (Max./Cont.) | kW(HP) 26/22 (35/30)            | 30/20 (40/27)            | 26/22 (35/30)            | 37/30 (50/40)            | 37/30 (50/40)            |
| Torque (Max./Cont.) | N.m 1,325 / 1,120               | 797 / 585                | 1,753 / 1,483            | 3,073 / 2,490            | 3,073 / 2,490            |
| Spindle Type        | - Belt + 2Step Gear Box         | BELT                     | Belt + 2Step Gear Box    | Belt + 2Step Gear Box    | Belt + 2Step Gear Box    |
| Spindle Nose        | - A2-8                          | A2-8                     | A2-11                    | A2-11                    | A2-11                    |
| C-axis Indexing     | deg -                           | 360° (0.001°)            | -                        | -                        | 360° (0.001°)            |

# Tail Stock

## Built-in Tail Stock



Big built-in type tail stock maintains accuracy in powerful heavy cutting, whose function can be effectively controlled by either program control automatically or manual.

| ITEM         | L400A/MA/C                        | L400LC/MC/LMC                     |
|--------------|-----------------------------------|-----------------------------------|
| Taper        | MT#4 (Built-In)                   | MT#5 (Built-In)                   |
| Quill Dia.   | $\varnothing 100\text{mm} (3.9")$ | $\varnothing 150\text{mm} (5.9")$ |
| Quill Travel | 130mm (5.1")                      | 132mm (5.2")                      |
| Travel       | 1,100mm (43.3")                   | 2,100mm (82.7")                   |

# TURRET



## High Speed and Powerful Turret

Big size of turret is capable of installing 12 tools, can install left or right tool in the all position, with permanent tooling not required to reinstall the tool during the workpiece changing. Bi-directional rotating type of turret driven by high torque of motor, is very accurate and fast, and  $\varnothing 260$  diameter of fine precise curbic coupling having the repeated division precision  $1/8,000$  degree and 12 ton of engaged force satisfies high precise processing and heavy cutting simultaneously.

## Milling Turret ("M" TYPE)

Big size of 12-station, excellent and precise BMT75 turret was adapted as standard, can simply and quickly change the tool by selecting VDI50 turret as option. All turret operation is controlled by a high torque servo motor, and turret split is possible in both direction within 0.2 second per turret face.

## BMT Turret

New type of BMT holder is strongly held by 4 screws, which displays excellent performance even in powerful cutting and in milling, drilling and tapping as well.

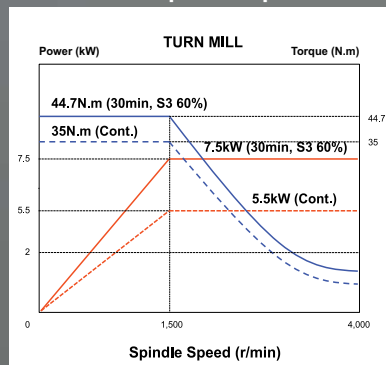
## Turret

| ITEM           | L400A/MA                          | L400C/LC                       | L400MC/LMC                       |
|----------------|-----------------------------------|--------------------------------|----------------------------------|
| Number of Tool | 12EA                              | 10EA                           | 12EA                             |
| Tool Size      | OD $\square 25\text{mm}$ (1")     | $\square 32\text{mm}$ (1.26")  | $\square 32\text{mm}$ (1.26")    |
|                | ID $\varnothing 50\text{mm}$ (2") | $\varnothing 50\text{mm}$ (2") | $\varnothing 63\text{mm}$ (2.5") |
| Indexing Time  | 0.2sec/step                       | 0.2sec/step                    | 0.2sec/step                      |

## Mill Turret

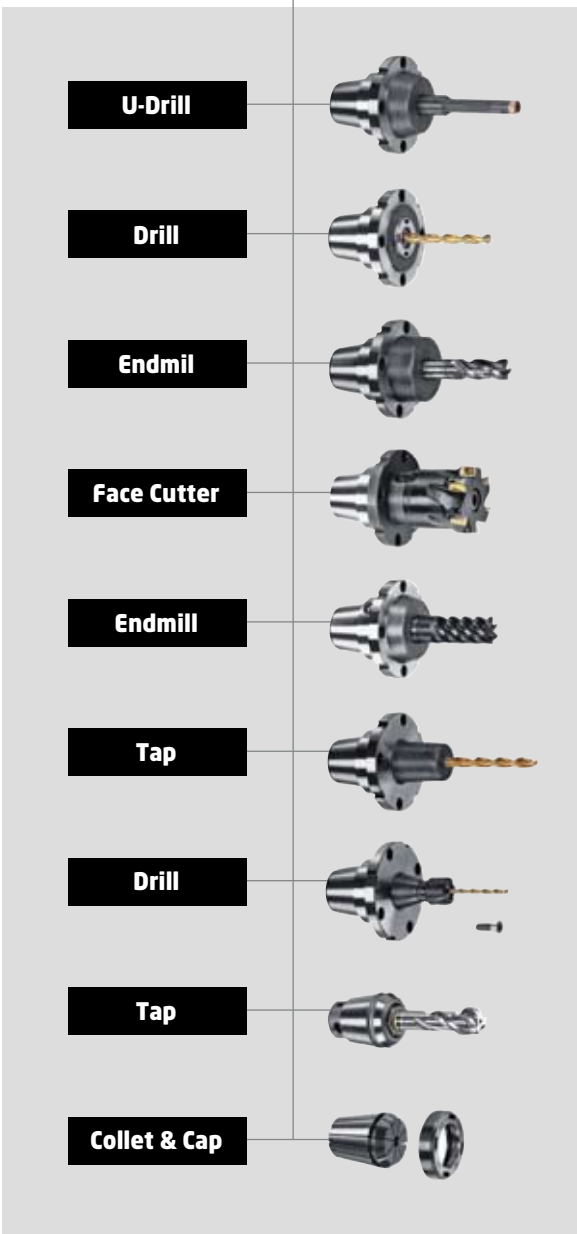
| ITEM                | L400MA/MC/LMC                          |
|---------------------|--|
| Output (Max./Cont.) | 7.5 / 5.5 kW (10 / 5.5HP)              |
| Speed (rpm)         | 4,000 r/min                            |
| Torque (Max./Cont.) | 44.7 / 35 N.m                          |
| Collet size         | $\varnothing 26\text{mm}$ (1.02") ER40 |
| Type                | BMT75 [OPT,VDI50]                      |

## Mill Turret Torque & Output



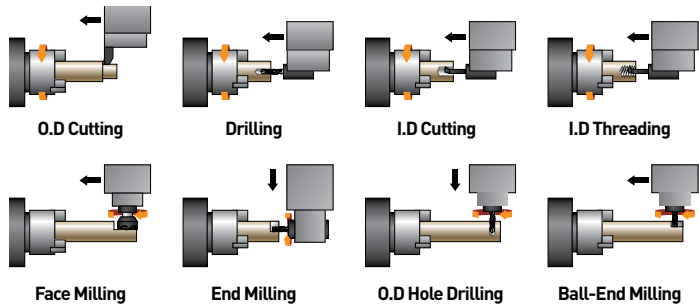
# Mill Tool Holder

The rotating tools holder may use ER COLLET and adopter. When using adopter both faces can be fixed, which provides good hardness and accuracy and facilitates exchange of tools.

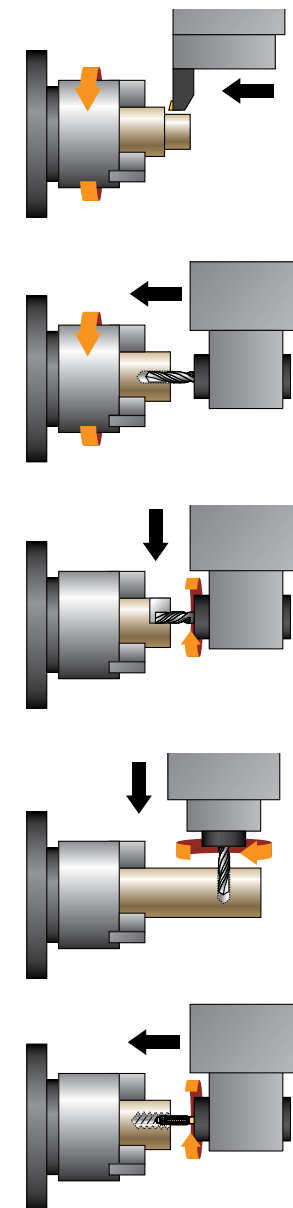


# Machining

## Machining Variation



## Machining Ability



## L400MA

### OD Cutting

(Material(JIS):S45C(Carbon steel))

|                         |             |
|-------------------------|-------------|
| Workpiece               | Ø276 mm     |
| Spindle speed           | 284 r/min   |
| Cutting depth           | 8 mm        |
| Forwarding speed (Rev.) | 0.45 mm/rev |
| Cutting speed           | 232 m/min   |
| Chip discharge          | 835 cc/min  |

### Drilling

(Material(JIS):S45C(Carbon steel))

|                         |             |
|-------------------------|-------------|
| Tool Dia.               | Ø40 mm      |
| Spindle speed           | 214 r/min   |
| Cutting depth           | 80 mm       |
| Forwarding speed (Rev.) | 0.36 mm/rev |
| Cutting speed           | 27 m/min    |
| Chip discharge          | 774 r/min   |

### End Milling

(Material(JIS):S45C(Carbon steel))

|                         |             |
|-------------------------|-------------|
| Tool speed              | 1,000 r/min |
| Cutting speed           | 63 m/min    |
| Forwarding speed (Min.) | 200 mm/min  |
| Forwarding speed (Feed) | 0.1 mm/t    |
| Cutting depth           | 4.0 mm      |
| Chip discharge          | 16 cc/min   |

### Drilling

(Material(JIS):S45C(Carbon steel))

|                         |            |
|-------------------------|------------|
| Tool speed              | 390 r/min  |
| Cutting speed           | 27 m/min   |
| Forwarding speed (Min.) | 117 mm/min |
| Forwarding speed (Rev.) | 0.3 mm/rev |
| Cutting depth           | 40 mm      |
| Chip discharge          | 44 cc/min  |

### Tapping

(Material(JIS):S45C(Carbon steel))

|                         |            |
|-------------------------|------------|
| Tap size                | M20 × 2.5  |
| Tool speed              | 127 r/min  |
| Cutting speed           | 8 m/min    |
| Forwarding speed (Min.) | 317 mm/min |
| Forwarding speed (Rev.) | 2.5 mm/rev |
| Cutting depth           | 30 mm      |

The above result might be different by types of processing circumstance



Programming system for creating CNC programs easily.

# Easy to Operate

HYUNDAI WIA's smart system is capable of more rapid program setting and readily maintaining, and is optimal to the productivity of machine.



M-Code List



Calculator



Product Guide



# HW-PGi F

Programming Guide i for Fanuc System (ⓄⓅ F32i-STD)



### Realistic 3D solid animation

Programing is simulated



### Example of easy programming

Readily programing with interactive type, without code



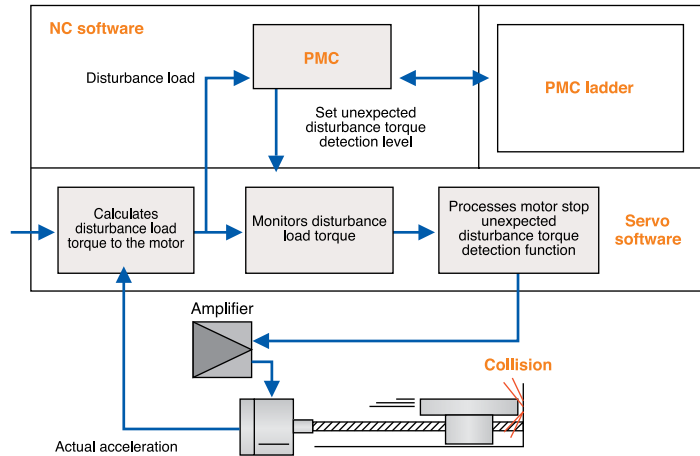
### Engraving Cycle

If characters are entered as C axis control, when the character is only entered without separate program is programmed automatically.

# HW-TL : Torque Limiter

If the turrets or tools are impacted, the axis is retreated by sensing contact load amount on the machine, and cause the machine's damage to minimize.

### Torque Limiter Diagram



# HW-TM : Tool Monitoring System ⓄⓅ

The HW-TM software interface provides real-time monitoring of tool wear and status. It features a 2-channel screen display with graphs showing tool wear over time and a data table for tool parameters. The interface includes a self-learning function for machining amount and a 3-stage status monitoring system (wear/break/no-load).

### HW-TM

- Real-time cut monitoring
- 2 Channel screen display
- Self learning for machining amount
- 3 stage of status monitoring (wear/break/no-load)

❖ If you order these options, Please contact sales person



# Option & Convenience

## Auto Q-Setter

By entering M-Code the tip of tool edge against the sensor, the worker can calibrate the tool quickly and accurately. So test cutting, measuring, calculation and calibration input are not needed. Even novice worker can calibrate within 30 seconds.



## Steady Rest

When processing product such as long shaft, it prevents vibration ensuring processing stability.



## Chip Conveyor

|                  |   |                          |      |                                      |
|------------------|---|--------------------------|------|--------------------------------------|
| Hinge Belt Type  | Material  | SS41, 45C, Steel casting | Chip | Roughly cut chips Synthetic chips    |
|                  | Show highly efficiency when treating lots of chips synthetic chip treatment, collective chips           |                          |      |                                      |
| Scraper Type     | Material  | SS41, 45C, Steel casting | Chip | Chips shortly cut and out            |
|                  | Facilitate to treat chip shortly cut and out, facilitate to forward chips with 90 degree                |                          |      |                                      |
| Drum Filter Type | Material  | AL, casting, non-metal   | Chip | Chips in low density and fine powder |
|                  | Have advantage in precision when processing aluminum because chips are not introduced to coolant nozzle |                          |      |                                      |



# Standard & Optional

## L400 Series

| Spindle & Chuck                                |                   | A | MA | C/LC | MC/LMC |
|--|-------------------|---|----|------|--------|
| Main Spindle Hollow Chuck 3 Jaw                | 12"               | ● | ●  | -    | -      |
|  | 15"               | ○ | ○  | ●    | ●      |
| Main Spindle Solid Chuck 3 Jaw                 | 12"               | ☆ | ☆  | -    | -      |
|  | 15"               | ☆ | ☆  | ☆    | ☆      |
| Standard Soft Jaw (1set)                       |                   | ● | ●  | ●    | ●      |
| Chuck Clamp Foot Switch                        |                   | ● | ●  | ●    | ●      |
| 2 Steps Hyd. Pressure Device                   |                   | ○ | ○  | ○    | ○      |
| Spindle Inside Stopper                         |                   | ☆ | ☆  | ☆    | ☆      |
| Main Spindle 5" Index                          |                   | ☆ | -  | ☆    | -      |
| Cs-Axis (0,001")                               |                   | ○ | ●  | ○    | ●      |
| Chuck Open/Close Confirmation Device           |                   | ○ | ○  | ○    | ○      |
| 2 Steps Chuck Foot Switch                      |                   | ☆ | ☆  | ☆    | ☆      |
| <b>Turret</b>                                  |                   |   |    |      |        |
| Tool Holder                                    |                   | ● | ●  | ●    | ●      |
| Dodecagon Turret                               |                   | ● | ●  | -    | ●      |
| Decagon Turret                                 |                   | - | -  | ●    | -      |
| Mill Turret                                    | Radial            | - | ●  | -    | ●      |
| Straight Milling Head (Radial)                 | Collet Type,1ea   | - | -  | -    | -      |
| Angular Milling Head (Axial)                   | Collet Type,1ea   | - | -  | -    | -      |
| Straight Milling Head (Radial)                 | Adapter Type      | - | -  | -    | -      |
| Angular Milling Head (Axial)                   | Adapter Type      | - | -  | -    | -      |
| Boring Sleeve                                  |                   | ● | ●  | ●    | ●      |
| Drill Socket                                   |                   | ● | ●  | ●    | ●      |
| U-Drill Holder                                 |                   | ○ | ○  | ○    | ○      |
| U-Drill Holder Sleeve                          |                   | ○ | ○  | ○    | ○      |
| Extension Holder                               | For Out-Dia       | ☆ | X  | ☆    | X      |
| Swivel Head                                    |                   | - | ☆  | -    | ☆      |
| <b>Tail Stock &amp; Steady Rest</b>            |                   |   |    |      |        |
| Built-In Tail Stock                            |                   | ● | ●  | ●    | ●      |
| Programmable Tail Stock                        |                   | ● | ●  | ●    | ●      |
| Live Center Type Tail Stock(MT #5)             |                   | ○ | ○  | ○    | ○      |
| Manual Type Steady Rest                        |                   | ☆ | ☆  | ☆    | ☆      |
| Manual Type Hyd. Steady Rest                   |                   | ○ | ○  | ○    | ○      |
| Programmable Hyd. Steady Rest                  |                   | ○ | ○  | ○    | ○      |
| Standard Dead Center                           |                   | ● | ●  | ●    | ●      |
| 2 Steps Tail Stock Pressure System             |                   | ☆ | ☆  | ☆    | ☆      |
| Quill Forward/Reverse Confirmation Device      |                   | ○ | ○  | ○    | ○      |
| Tail Stock Foot Switch                         |                   | ○ | ○  | ○    | ○      |
| <b>Coolant &amp; Air Blow</b>                  |                   |   |    |      |        |
| Standard Coolant (Nozzle)                      |                   | ● | ●  | ●    | ●      |
| Chuck Coolant (Upper Chuck)                    |                   | ☆ | ☆  | ☆    | ☆      |
| Gun Coolant                                    |                   | ○ | ○  | ○    | ○      |
| Spindle Thru Coolant (Only for Special Chuck)  |                   | ☆ | ☆  | ☆    | ☆      |
| Thru Coolant for Live Tool                     |                   | - | X  | -    | X      |
| Chuck Air Blow(Upper Chuck)                    |                   | ○ | ○  | ○    | ○      |
| Tail Stock Air Blow (Upper Tail Stock)         |                   | ☆ | ☆  | ☆    | ☆      |
| Turret Air Blow                                |                   | ☆ | ☆  | ☆    | ☆      |
| Air Gun  |                   | ○ | ○  | ○    | ○      |
| Spindle Thru Air Blow (Only for Special Chuck) |                   | ☆ | ☆  | ☆    | ☆      |
| High Pressure Coolant                          | 6Bar              | ☆ | ☆  | ☆    | ☆      |
| Power Coolant System(For Automation)           |                   | ☆ | ☆  | ☆    | ☆      |
| Coolant Chiller                                |                   | ☆ | ☆  | ☆    | ☆      |
| <b>Chip Disposal</b>                           |                   |   |    |      |        |
| Coolant Tank                                   | 300 ℓ             | ● | ●  | C●   | MC●    |
|  | 400 ℓ             | - | -  | LC●  | LMC●   |
| Chip Conveyor (Hinge/Scraper)                  | Front (Right)     | ○ | ○  | ○    | ○      |
|  | Rear (Rear)       | X | X  | X    | X      |
| Special Chip Conveyor (Drum Filter)            |                   | ☆ | ☆  | ☆    | ☆      |
| Chip Box                                       | Standard(180 ℓ)   | ○ | ○  | ○    | ○      |
|  | Swing(200 ℓ)      | ○ | ○  | ○    | ○      |
|  | Large Size(330 ℓ) | ○ | ○  | ○    | ○      |
|  | Customized        | ☆ | ☆  | ☆    | ☆      |

❖ The specifications as above will only serve as a reference.

● : Standard ○ : Option ☆ : Prior Consultation X : Non Application - : Impossible

| Safety Device   |                 | A | MA | C/LC | MC/LMC |
|---|-----------------|---|----|------|--------|
| Door Inter-Lock   |                 | ● | ●  | ●    | ●      |
| Total Splash Guard                                      |                 | ● | ●  | ●    | ●      |
| Chuck Pressure Failure Detector                         |                 | ○ | ○  | ○    | ○      |
| Back Spin Torque Limiter (BST)                          |                 | ● | ●  | ●    | ●      |
| Torque Limiter  |                 | ☆ | ☆  | ☆    | ☆      |
| <b>Electric Device</b>                                  |                 |   |    |      |        |
| Call Light  | 1 Color : ●     | ● | ●  | ●    | ●      |
| Call Light  | 3 Color : ●●●   | ○ | ○  | ○    | ○      |
| Call Light & Buzzer                                     | 3 Color : ●●●B  | ○ | ○  | ○    | ○      |
| Electric Cabinet Light                                  |                 | ○ | ○  | ○    | ○      |
| Total Counter   | Digital         | ○ | ○  | ○    | ○      |
| Tool Counter  | Digital         | ○ | ○  | ○    | ○      |
| Multi Tool Counter                                      | 6ea             | ○ | ○  | ○    | ○      |
|   | 9ea             | ○ | ○  | ○    | ○      |
| Electric Circuit Breaker                                |                 | ○ | ○  | ○    | ○      |
| AVR(Auto Voltage Regulator)                             |                 | ☆ | ☆  | ☆    | ☆      |
| Transformer & Cable                                     | 35kVA           | ○ | -  | -    | -      |
|   | 40kVA           | - | -  | ○    | -      |
|   | 50kVA           | - | ○  | -    | -      |
|   | 60kVA           | - | -  | -    | ○      |
| Auto Power Off  |                 | ○ | ○  | ○    | ○      |
| <b>Measurement</b>                                      |                 |   |    |      |        |
| Q-Setter  |                 | - | -  | -    | -      |
| Automatic Q-Setter                                      |                 | ● | ●  | ●    | ●      |
| Work Close Confirmation Device (Only for Special Chuck) | TACO            | ☆ | ☆  | ☆    | ☆      |
|   | SMC             | ☆ | ☆  | ☆    | ☆      |
| Work Setter   |                 | ☆ | ☆  | ☆    | ☆      |
| Linear Scale  | X Axis          | X | X  | X    | X      |
|   | Z Axis          | X | X  | X    | X      |
| Coolant Level Sensor (Only for Chip Conveyor)           |                 | ☆ | ☆  | ☆    | ☆      |
| <b>Environment</b>                                      |                 |   |    |      |        |
| Air Conditioner   |                 | ○ | ○  | ○    | ○      |
| Dehumidifier  |                 | ○ | ○  | ○    | ○      |
| Oil Mist Collector                                      |                 | ○ | ○  | ○    | ○      |
| Oil Skimmer (Only for Chip Conveyor)                    |                 | ○ | ○  | ○    | ○      |
| MQL (Minimal Quantity Lubrication)                      |                 | ☆ | ☆  | ☆    | ☆      |
| <b>Fixture &amp; Automation</b>                         |                 |   |    |      |        |
| Auto Door   | Standard        | ○ | ○  | ○    | ○      |
|   | High Speed      | ○ | ○  | ○    | ○      |
| Auto Shutter (Only for Automatic System)                |                 | X | X  | X    | X      |
| Sub Operation Pannel                                    |                 | ☆ | ☆  | ☆    | ☆      |
| Bar Feeder Interface                                    |                 | - | -  | -    | -      |
| Bar Feeder (FEDEK)                                      |                 | - | -  | -    | -      |
| Extra M-Code 4ea  |                 | ○ | ○  | ○    | ○      |
| Automation Interface                                    |                 | ☆ | ☆  | ☆    | ☆      |
| I/O Extension (IN & OUT)                                | 16Contact       | ○ | ○  | ○    | ○      |
|   | 32Contact       | ○ | ○  | ○    | ○      |
| Parts Catcher   | Main SP.        | X | X  | X    | X      |
| Turret Work Pusher (For Automation)                     |                 | ☆ | ☆  | ☆    | ☆      |
| <b>Hyd. Device</b>                                      |                 |   |    |      |        |
| Standard Hyd. Cylinder                                  | Hollow          | ● | ●  | ●    | ●      |
| Standard Hyd. Unit                                      | 60bar/13 ℓ      | - | -  | -    | -      |
|   | 60bar/20 ℓ      | ● | ●  | LC●  | LMC●   |
| <b>Software</b>   |                 |   |    |      |        |
| Machine Guidance  |                 | ☆ | ☆  | ☆    | ☆      |
| HWTM (Tool Monitoring System)                           |                 | ☆ | ☆  | ☆    | ☆      |
| DNC Software  |                 | ○ | ○  | ○    | ○      |
| Dialogic Program  |                 | ☆ | ☆  | ☆    | ☆      |
| <b>ETC</b>  |                 |   |    |      |        |
| Tool Box  |                 | ● | ●  | ●    | ●      |
| Customized Color  | Need Munsel No. | ☆ | ☆  | ☆    | ☆      |
| CAD & CAM   |                 | ☆ | ☆  | ☆    | ☆      |

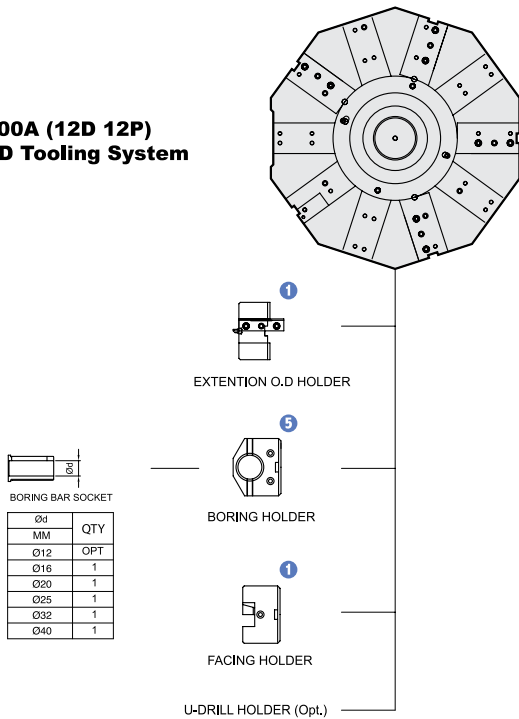


# Specifications

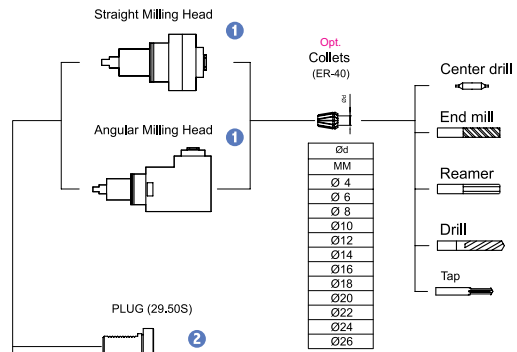
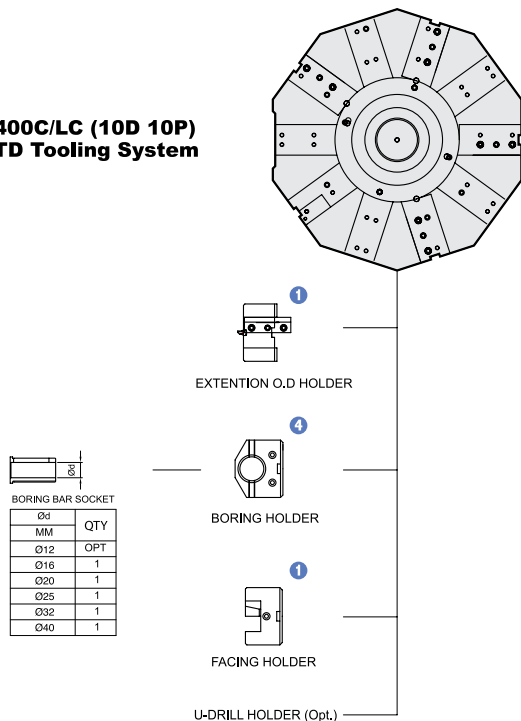
unit : mm(in)

## Tooling System

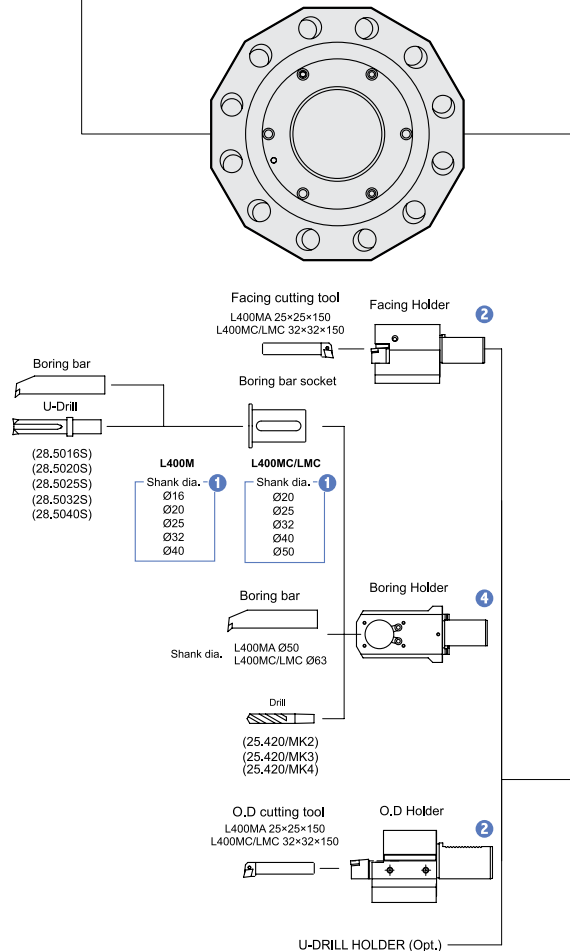
### L400A (12D 12P) STD Tooling System



### L400C/LC (10D 10P) STD Tooling System



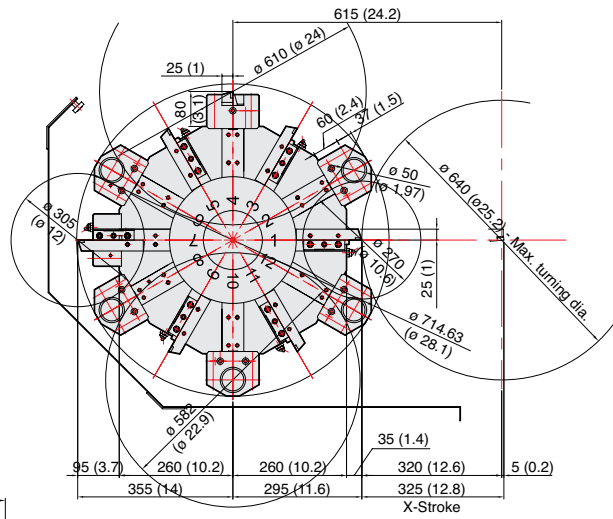
### L400MA/MC/LMC (12D 12P) Mill Tooling System



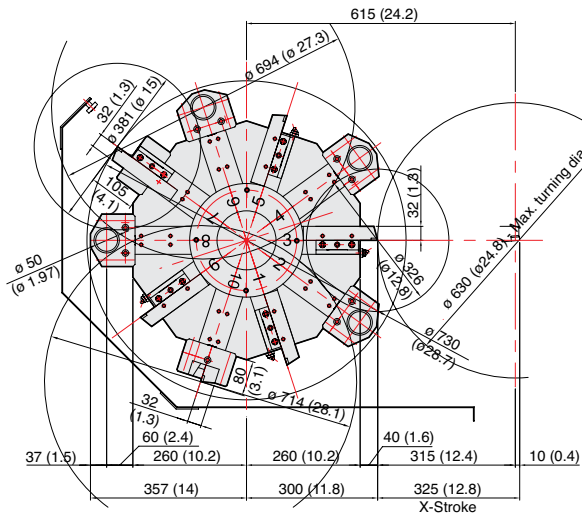
unit : mm(in)

**Interference**

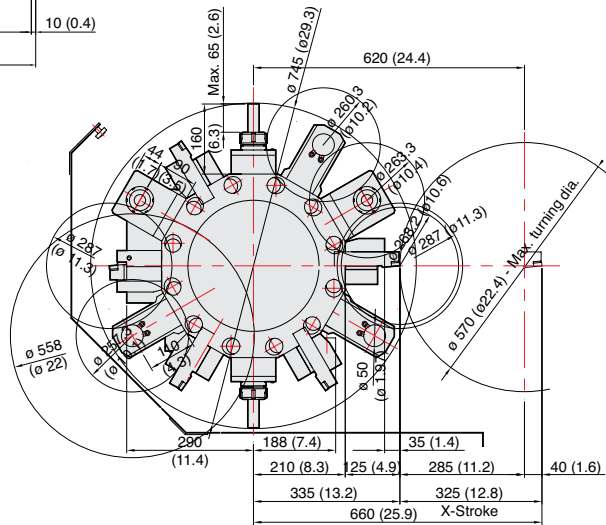
**L400A**



**L400C/LC**



**L400MA/MC/LMC**

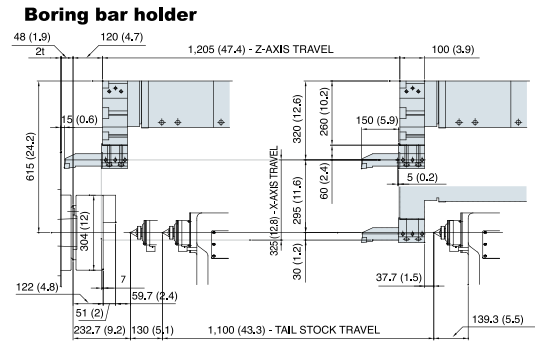
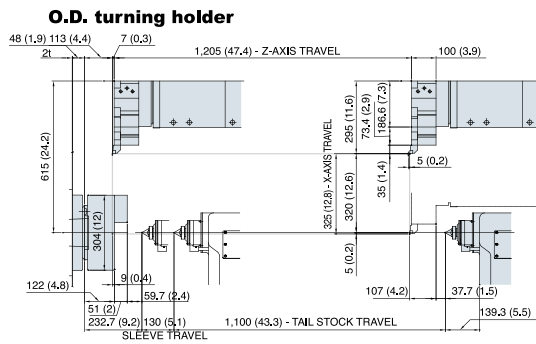


# Specifications

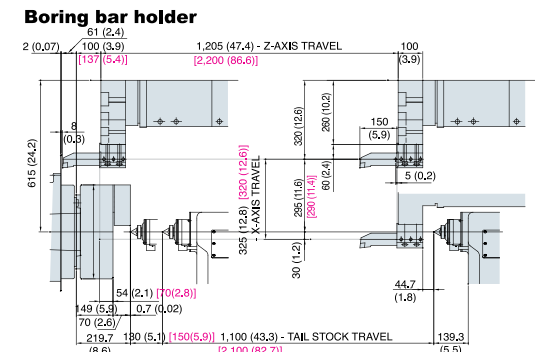
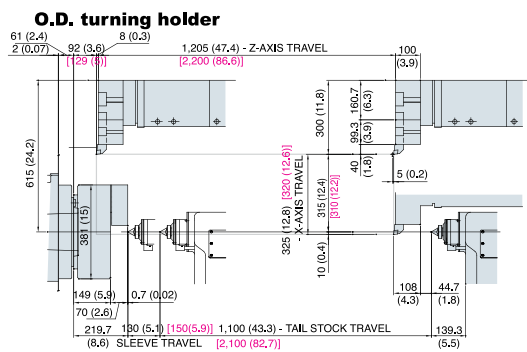
unit : mm(in)

## Tooling Travel Range

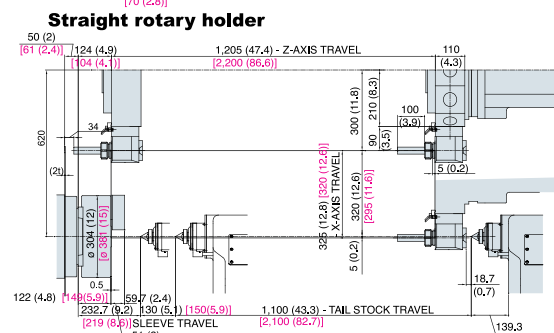
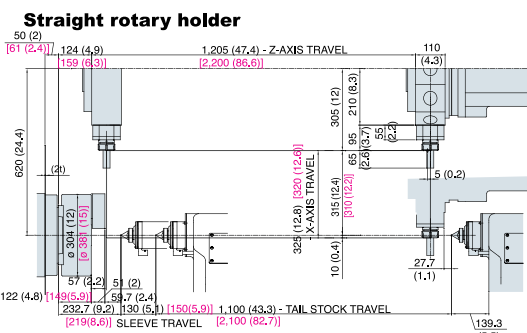
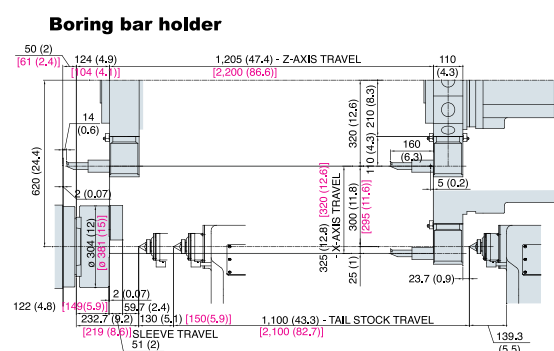
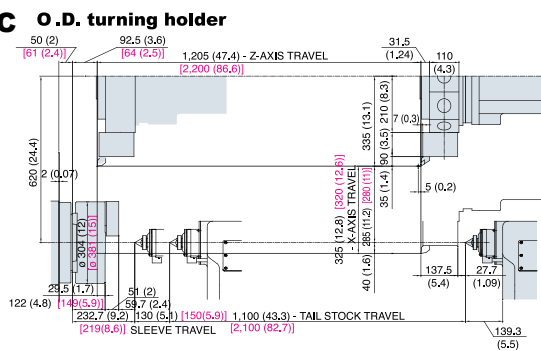
### L400A



### L400C L400LC



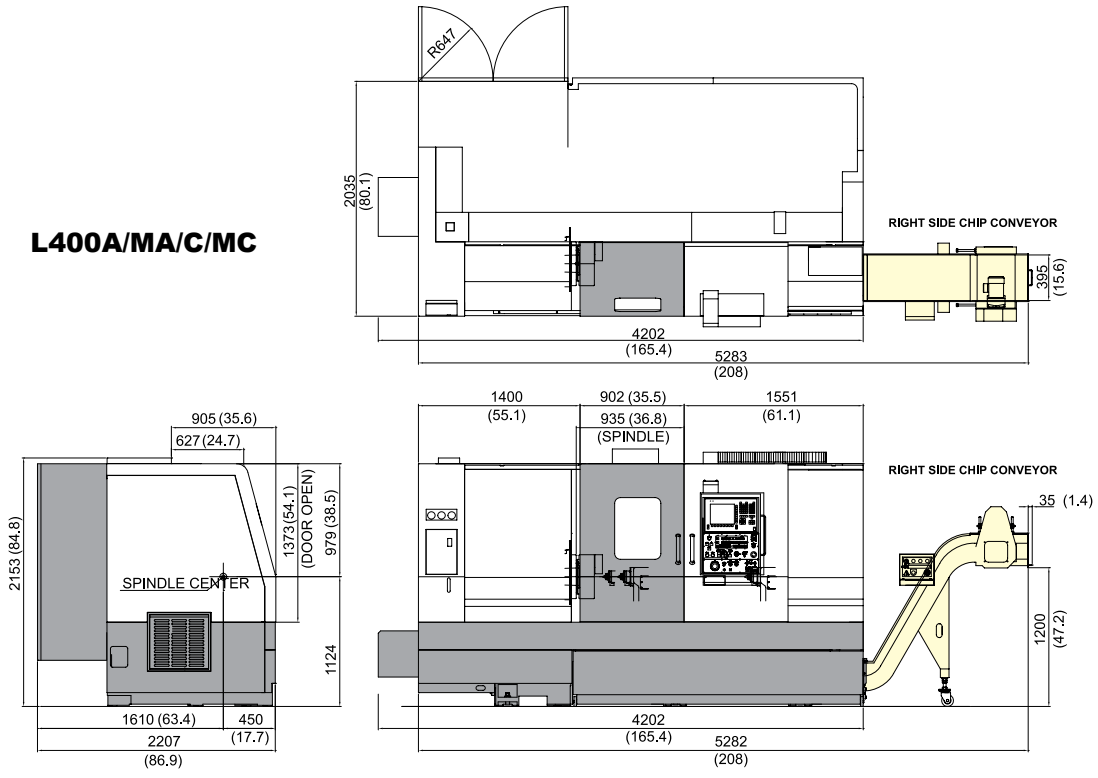
### L400MA/MC L400LMC



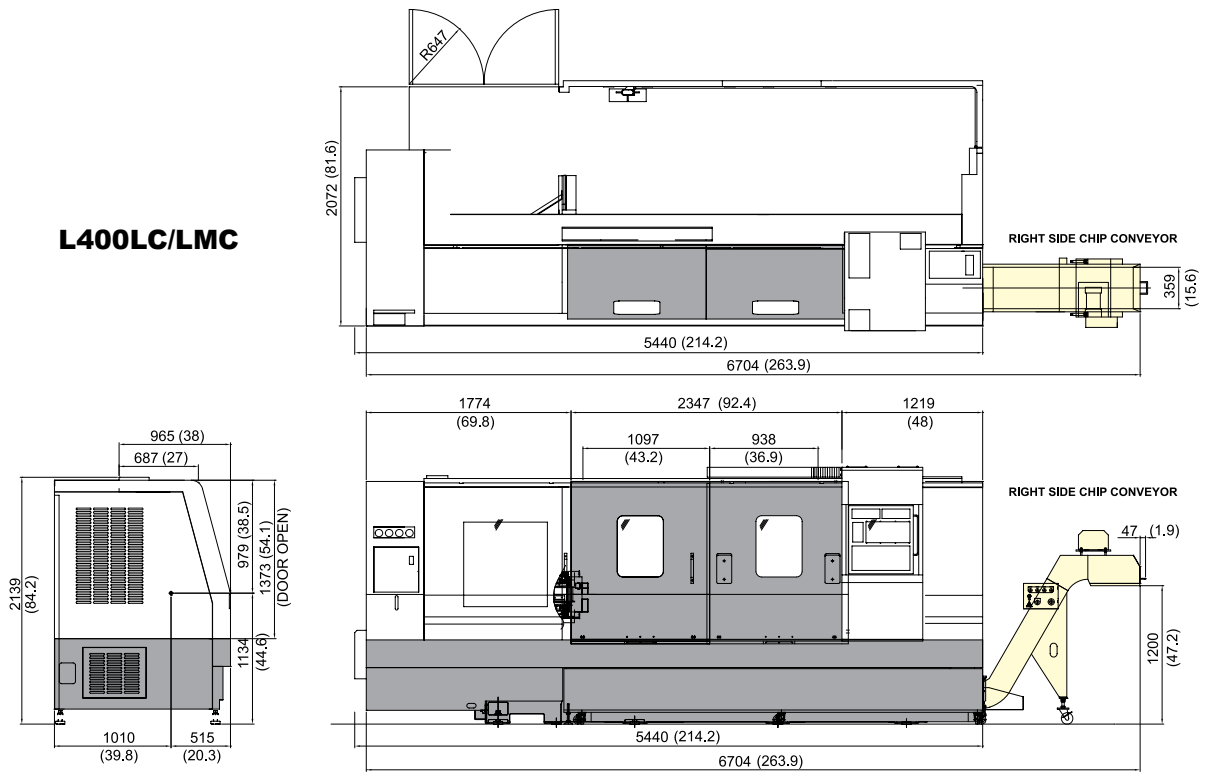
unit : mm(in)

**External Dimensions**

**L400A/MA/C/MC**



**L400LC/LMC**





# Specifications

## Specifications

| ITEM          |                          |          | L400A                                   | L400MA           | L400C           | L400MC           | L400LC                     | L400LMC          |  |
|---------------|--------------------------|----------|---|------------------|-----------------|------------------|----------------------------|------------------|--|
| CAPACITY      | Swing Over the Bed       | mm(in)   | Ø780 (30.7")                            |                  |                 |                  | Ø725 (28.5")               |                  |  |
|               | Swing Over the Carriage  | mm(in)   | Ø535 (21.1")                            |                  |                 |                  |                            |                  |  |
|               | Max. Turning Dia.        | mm(in)   | Ø640 (25.2")                            | Ø570 (22.4")     | Ø630 (24.8")    | Ø560 (22")       | Ø630 (24.8")               | Ø560 (22")       |  |
|               | Max. Turning Length      | mm(in)   | 1,180 (46.5")                           |                  | 1,170 (46.1")   | 1,180 (46.5")    | 2,120 (83.5")              | 2,100 (82.7")    |  |
|               | Bar Capacity             | mm(in)   | Ø90 (3.5")                              |                  | Ø117 (4.6")     |                  |                            |                  |  |
| SPINDLE       | Chuck Size               | mm(in)   | Ø304 (12")                              |                  |                 | Ø381 (15")       |                            |                  |  |
|               | Spindle Bore             | mm(in)   | Ø104 (4.1")                             |                  |                 | Ø130 (5.1")      |                            |                  |  |
|               | Spindle Speed (rpm)      | r/min    | 3,000                                   |                  |                 | 2,000            |                            |                  |  |
|               | Motor (Max/Cont.)        | kW(HP)   | 26/22 (35/30)                           | 30/20 (40/26.8)  | 26/22 (35/30)   | 37/30 (50/40)    |                            |                  |  |
|               | Torque (Max/Con.)        | N.m      | 1,325/1,120                             | 797/585          | 1,753/1,483     | 3,073/2,490      |                            |                  |  |
|               | Spindle Type             |          | BELT+2STEP GEAR                         | BELT             | BELT+2STEP GEAR |                  |                            |                  |  |
|               | Spindle Nose             |          | A2-8                                    |                  |                 | A2-11            |                            |                  |  |
|               | C-axis Indexing          | deg      | -                                       | 360° (0.001°)    | -               | 360° (0.001°)    | -                          | 360° (0.001°)    |  |
| FEED          | Travel (X/Z/B)           | mm(in)   | 325/1,205 (12.8"/47.4")                 |                  |                 | 320/1,200        |                            | 320/2,200        |  |
|               | Rapid Travel (X/Z/B)     | m/min    | 20/25                                   |                  |                 |                  | 20/20                      |                  |  |
|               | Slide Type               | X Axis   | BOX GUIDE                               |                  |                 |                  |                            |                  |  |
|               |                          | Y Axis   | BOX GUIDE                               | LM GUIDE         | BOX GUIDE       |                  |                            |                  |  |
| TURRET        | No. of Tool              | EA       | 12                                      |                  | 10              | 12               | 10                         | 12               |  |
|               | Tool Size                | OD       | □ 25×25 (1"×1")                         |                  |                 | □ 32×32          |                            |                  |  |
|               |                          | ID       | Ø50 (2")                                |                  | Ø63 (2.5")      | Ø50 (2")         | Ø63 (2.5")                 |                  |  |
|               | Indexing Time            | sec/step | 0.2                                     |                  |                 |                  |                            |                  |  |
| LIVE TOOL     | Motor (Max/Cont.)        | kW(HP)   | -                                       | 7.5/5.5 (10/7.5) | -               | 7.5/5.5 (10/7.5) | -                          | 7.5/5.5 (10/7.5) |  |
|               | Milling Tool Speed (rpm) | r/min    | -                                       | 4,000            | -               | 4,000            | -                          | 4,000            |  |
|               | Torque (Max/Cont.)       | N.m      | -                                       | 44.7/35          | -               | 44.7/35          | -                          | 44.7/35          |  |
|               | Collet Size              | mm(in)   | -                                       | Ø26 (ER40)       | -               | Ø26 (ER40)       | -                          | Ø26 (ER40)       |  |
|               | Type                     | -        | -                                       | BMT75 [VDI50]    | -               | BMT75P [VDI50]   | -                          | BMT75 [VDI50]    |  |
| TAIL STOCK    | Taper                    | -        | MT4 (Built-in)                          |                  |                 | MT5 (Built-in)   |                            |                  |  |
|               | Quill Dia.               | mm(in)   | Ø100 (3.9")                             |                  |                 | Ø150 (5.9")      |                            |                  |  |
|               | Quill Travel             | mm(in)   | 130 (5.1")                              |                  |                 | 150 (5.9")       |                            |                  |  |
|               | Travel                   | mm(in)   | 1,100 (43.3")                           |                  |                 | 2,100 (82.7")    |                            |                  |  |
| TANK CAPACITY | Coolant Tank             | ℓ (gal)  | 300 (79.3)                              |                  |                 | 400 (105.7)      |                            |                  |  |
|               | Lubricating Tank         | ℓ (gal)  | 2 (0.5)                                 |                  |                 | 4 (1.1)          |                            |                  |  |
| POWER SUPPLY  | Electric Power Supply    | kVA      | 35                                      | 50               | 40              | 60               | 40                         | 60               |  |
|               | Thickness of Power Cable | Sq       | Over 50                                 |                  |                 |                  |                            |                  |  |
|               | Voltage                  | V/Hz     | 220/60 (200/50)                         |                  |                 | 380/60           |                            | 220/60 (200/50)  |  |
| MACHINE       | Floor Space (L×W)        | mm(in)   | 4,202×2,207 (165.4"×86.9")              |                  |                 |                  | 5,440×2,244 (214.2"×88.3") |                  |  |
|               | Height                   | mm(in)   | 2,153 (84.8")                           |                  |                 |                  | 2,139 (84.2")              |                  |  |
|               | Weight                   | kg(lb)   | 8,500 (18,739.3)                        |                  |                 |                  | 11,000 (24,251)            |                  |  |
| NC            | Controller               | -        | HYUNDAI WIA FANUC i Series [FANUC32i-A] |                  |                 |                  |                            |                  |  |

❖ Specifications are subject to change for improvement without notice.

[ ] : Option

# Controller

## HYUNDAI WIA FANUC iSeries

### Control function / Screen display

|                                      |   |
|--------------------------------------|---|
| Control axis number                  | Max, 4 axes   |
|                                      | X, Z axis   |
|                                      | X, Z, C axis (M type)                               |
|                                      | X, Z, B, C axis (MS type)                           |
| Simultaneous control axis number     | 2 axis/straight, arc interpolation<br>(Max, 4 axes) |
| Spindle axis number *                | 2 axis  |
| Min. input unit                      | X, Z, B axis : 0,001mm (0,0001" )                   |
|                                      | C axis : 0,001 deg.                                 |
| Min. increment                       | X, Z, B axis : 0,001mm (0,0001" )                   |
|                                      | C axis : 0,001 deg.                                 |
| High speed HRV control               |   |
| PMC control                          |   |
| Inch/metric conversion               | G20 / G21   |
| Interlock                            | Each axis / All axis                                |
| Machinelock                          | Full axis   |
| Emergency stop                       |   |
| Stroke check 1                       | Over-travel   |
| Stroke check 2                       |   |
| Stroke check 3                       |   |
| Follow up                            |   |
| Sub off                              |   |
| Backlash compensation                | +/- 0-9999 Pulse                                    |
| Position switch                      |   |
| Fault load detection                 | Back spin torque limiter (BST)                      |
| High resolution transfer control     |   |
| (HRM) LCD / MDI                      | 8,4" Color LCD                                      |
| Handling                             |   |
| Auto handling (memory)               |   |
| MDI handling                         |   |
| Search function                      | Sequence, Program                                   |
| Program re-start                     |   |
| Preventive function for mis-handling |   |
| Buffer registration                  | Dry run, Program check                              |
| Program check function               |   |
| Single block                         |   |
| Feed function                        |   |
| Manual jog feed                      | Rapid transfer, Jog, Handle                         |
| Feed command                         | x1, x10, x100                                       |
| Feed override                        | Direct command for F code feed                      |
| Jog override                         | 0-200% (10% units)                                  |
| Rapid transfer override              | 0-2,000 mm/min [79 ipm]                             |
| Override release                     | F1, F5, F25 / F50, F100%                            |
| Override release                     |   |
| Transfer/minute, transfer/rpm        |   |

### Program input and interpolation function

|  |   |
|--|---|
| Nano interpolation                         | Positioning / Straight / Arc<br>(G00 / G01 / G02 / G03) |
|  |   |
| Dwell function                             | G04, 0-9999,9999 sec                                    |
| Threading retract                          |   |
| Variable lead threading                    |   |
| Multiple threading                         |   |
| Continuous threading                       |   |
| Threading, synchronous cutting             |   |
| Return of first zero point                 | G28, Manual   |
| Return check of zero point                 | G27   |
| Return of second, third, fourth zero point | G30   |
| Program stop/over                          | M00, M01 / M02, M30                                     |
| Tape code                                  | EIA / ISO   |
| Optional block skip                        | 1 EA  |
| Max. program enter unit                    | +/- 9999,9999"  |
| Program number                             | O4 digit number   |
| Absolute, incremental programming          |   |
| Decimal number entering                    |   |
| Plain selection                            | G17, G18, G19   |
| Work coordinate selection                  | G52 to G59  |
| Work coordinate preset                     | G50,3   |
| Manual absolute                            | "ON" Fixed  |
| Drawing dimension direct input programming | Included chamfering / Corner R                          |
| G code system                              | A   |
| Programmable data input                    | G10   |
| Sub program call                           | 10 Steps  |
| Custom macro B                             |   |
| Custom macro variable addition             | #100 to #199, #500 to #999                              |
| Multiple repetitive cycles                 |   |
| Multiple repetitive cycles II              |   |
| Lathe fixed cycle                          |   |

### Sub / Main spindle function

|                           |  |
|---------------------------|--|
| M-Code function           |  |
| M-Code function lock      | M4 digit number                                      |
| Lock sp. speed command    |  |
| Main sp. constant control | S + 4 digit number, binary number<br>output G96, G97 |
| Spindle speed override    | 50% ~ 150% (10% unit)                                |
| Spindle speed override    |  |
| Rigid tapping             |  |

### Tool function / Tool compensation

|                      |          |
|----------------------|----------|
| Tool function        | T2 + 2   |
| Tool offset quantity | 64 pairs |

### Tool function / Tool compensation

|   |  |
|---|--|
| Tool offset                                   |  |
| Tool nose radius compensation                 | G40, G41, G42                            |
| Configuration/wear compensation               |  |
| Tool life management                          |  |
| Direct input of measuring tool compensation B |  |
| Data input, output and editing function       |  |
| Input/output interface                        | RS232C                                   |
| Memory card input and output                  |  |
| Embedded Ethernet                             | 100Mbps                                  |
| Program storing capacity                      | 512 Kbyte                                |
| Program registration quantity                 | 400 EA                                   |
| Memory lock                                   |  |
| Background edit                               |  |
| Additional expandable edit                    | NC program copy, move, change            |
| Screen, diagnosis and setting function        |  |
| Self diagnosis function                       |  |
| Historic screen                               | Alarm and handling screen                |
| Help function                                 |  |
| Outside message                               |  |
| Operation time/counter display                |  |
| Actual sp. speed, T code display              |  |
| Actual machining feed rate display            |  |
| Handling monitor screen                       | Rod meter light                          |
| Graphic screen                                |  |
| Spindle/servo setting screen                  |  |
| Languages                                     | Selection of random 5 EA                 |
| LCD screen save                               | Screen saver                             |
| Auto data backup                              |  |
| Function according with machine specification |  |
| Cs contouring function                        | MILL type                                |
| Stored pitch error compensation               | MILL type                                |
| Pole coordinate command                       | MILL type                                |
| Cylinder interpolation                        | MILL type                                |
| Drill fixed cycle                             | MILL type                                |
| Sp. positioning expandable                    | MILL type, Sub spindle type              |
| Main sp. synchronization control              | Sub spindle type                         |
| Torque control                                | Sub spindle type                         |
| <b>Option</b>                                 |  |
| High speed Ethernet                           | 100 Mbps (Option board is required)      |
| Optional block skip                           | 9 EA                                     |
| G code system                                 | B / C                                    |
| Polygon turning                               |  |
| Dynamic graphic display                       |  |
| 8 level data protection function              |  |
| Manual guide i                                | Interactive program<br>(10,4" Color LCD) |
| Tool load monitoring function                 | HWTM (embedded Fanuc type)               |

- Figures in inch are converted from metric values.
- Design and specifications subject to change without notice.

# Controller

## FANUC 32i-A

### Axis control / Display unit

|   |  |
|---|--|
| Controlled axes                                       | Max, 4 axes are available                |
|   | X, Z axes                                |
|   | X, Z, C axes (M type machine)            |
|   | X, Z, Y, C axes (Y type machine)         |
| Simultaneous controllable axes                        | X, Z, B, C axes (MS type machine)        |
|   | 2axes / Linear and circular (Max, 4axes) |
| Least input increment                                 | X, Z, Y, B axes : 0,001 mm (0,0001" )    |
|   | C axis : 0,001 deg                       |
| Least command increment                               | X, Z, Y, B axes : 0,001 mm (0,0001" )    |
|   | C axis : 0,001 deg                       |
| High speed HRV control                                |  |
| Inch / Metric conversion                              | G20 / G21                                |
| Interlock   | Each axis / All axes                     |
| Machine lock  | All axes                                 |
| Emergency stop  |  |
| Stored stroke check 1                                 | Over-travel                              |
| Stored stroke check 2                                 |  |
| Stored stroke check 3                                 |  |
| Follow-up   |  |
| Servo-off   |  |
| Backlash compensation                                 | +/- 0-9999 pulses                        |
|   | (Rapid traverse & cutting feed)          |
| Position switch                                       |  |
| Unexpected disturbance torque detection (HRM) control | Back-spin torque limiter (BST)           |
| LCD / MDI   | 10,4" Color LCD                          |

### Operation

|                              |                        |
|------------------------------|------------------------|
| Automatic operation (memory) |                        |
| MDI operation                |                        |
| Search function              | Sequence, program      |
| Program restart              |                        |
| Wrong operation prevention   |                        |
| Buffer register              |                        |
| Program check function       | Dry run, program check |
| Single block                 |                        |

### Feed functions

|                            |                                |
|----------------------------|--------------------------------|
| Manual jog feed            | Rapid, jog, handle             |
| Manual handle feedrate     | x1, x10, x100                  |
| Feed command               | F code feedrate direct command |
| Feedrate override          | 0-200 % (10% units)            |
| Jog override               | 0-2,000 mm/min[79 ipm]         |
| Rapid traverse override    | F1, F5, F25/F50, F100%         |
| Override cancel            |                                |
| Feed per minute / rotation |                                |

### Program input & interpolation functions

|                    |                                 |
|--------------------|---------------------------------|
| Nano interpolation | Positioning / Linear / Circular |
|                    | (G00 / G01 / G02, G03)          |
| Dwell              | G04, 0-9999,9999 sec            |

### Program input & interpolation functions

|  |                                |
|--|--------------------------------|
| Thread retract                           |                                |
| Variable lead threading                  |                                |
| 1st reference point return               | G28, manual                    |
| Reference point return check             | G27                            |
| 2nd reference point return               | G30                            |
| Program stop / End                       | M00, M01 / M02, M30            |
| Tape code                                | EIA / ISO                      |
| Optional block skip                      | 1 ea                           |
| Maximum programmable dimensions          | +/- 9999,9999"                 |
| Program number                           | O4 digits                      |
| Absolute and incremental programming     |                                |
| Decimal point input                      |                                |
| Plane selection                          | G17, G18, G19                  |
| Work coordinate system selection         | G52 to G59                     |
| Manual absolute                          | "ON" Fixed                     |
| Direct drawing dimension programming     | Included chamfering / Corner R |
| G code system                            | A                              |
| Programmable data input                  | G10                            |
| Sub program call                         | 10 folds nested                |
| Custom macro B                           |                                |
| Addition of custom macro common variable | #100 to #199, #500 to #999     |
| Multiple repetitive cycles               |                                |
| Multiple repetitive cycles II            |                                |
| Canned cycles for turning                |                                |
| Manual guide I                           | Conversational programming     |

### Auxiliary / Spindle speed functions

|                                |                          |
|--------------------------------|--------------------------|
| Miscellaneous function         | M4 digits                |
| Miscellaneous function lock    |                          |
| Spindle speed command          | S4 digits, binary output |
| Constant surface speed control |                          |
| Spindle speed override         | 50% to 150% (10% units)  |
| Spindle orientation            |                          |
| Rigid tapping                  |                          |

### Tool function / Tool compensation

|  |               |
|--|---------------|
| Tool function                                      | T2 + 2        |
| Tool offset pairs                                  | 64 pairs      |
| Tool offset  |               |
| Tool nose radius compensation                      | G40, G41, G42 |
| Geometry / Wear compensation                       |               |
| Direct input of measured tool compensation value B |               |
| Tool life management                               |               |

### Data in/output & editing functions

|                            |        |
|----------------------------|--------|
| Reader / Puncher interface | RS232C |
| Memory card input/output   |        |

### Data in/output & editing functions

|  |                                  |
|--|----------------------------------|
| Embedded ethernet                        | 100 Mbps                         |
| Part program storage length              | 256 Kbyte                        |
| Number of registrable programs expansion | Max, 500 programs                |
| Memory lock                              |                                  |
| Background editing                       |                                  |
| Extended part program edition            | Copy, move, change of NC program |

### Display, diagnosis & setting functions

|  |                           |
|--|---------------------------|
| Self-diagnosis function                    |                           |
| History display                            | Alarm & operation display |
| Help function                              |                           |
| External message                           |                           |
| Run hour / Parts count display             |                           |
| Display of actual spindle speed and T code |                           |
| Actual cutting feedrate display            |                           |
| Operating monitor screen                   | Load meter, etc           |
| Graphic display                            |                           |
| Spindle / Servo setting screen             |                           |
| Selection of 5 optional language           |                           |
| Erase CRT screen display                   | Screen saver              |
| Automatic data backup                      |                           |

### Functions according to machine specification

|                                 |                        |
|---------------------------------|------------------------|
| Cs contouring control           | Turn mill              |
| Stored pitch error compensation | Turn mill              |
| Polar coordinate interpolation  | Turn mill              |
| Cylindrical interpolation       | Turn mill              |
| Canned cycles for drilling      | Turn mill              |
| spindle orientation expansion   | Turn mill, Sub spindle |
| Spindle synchronous control     | Sub spindle            |
| Torque control                  | Sub spindle            |
| Y axis offset                   | Y type machine         |
| Angular axis control            | Y type machine         |
|                                 | (Except LY Series)     |

### Options

|                                  |                                     |
|----------------------------------|-------------------------------------|
| Fast ethernet                    | 100 Mbps (Option board is required) |
| Optional block skip              | 9 ea                                |
| 3rd & 4th reference point return |                                     |
| G code system                    | B / C                               |
| Part program storage length      | 512 Kbyte                           |
| Polygon turning                  |                                     |
| Helical interpolation            |                                     |
| Dynamic graphic display          |                                     |
| Protection of data at 8 levels   |                                     |
| Tool Monitoring function         | HWTM (Built-in Fanuc type)          |

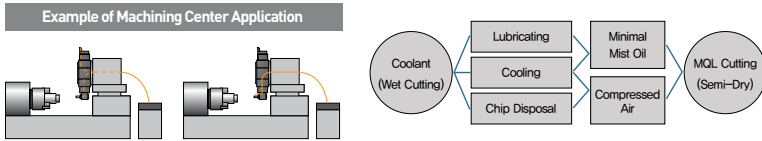
- Figures in inch are converted from metric values.
- Design and specifications subject to change without notice.

# ENERGY SAVING & ECO FRIENDLY



◆ This Catalogue made by recycle paper

## MQL : Minimal Quantity Lubrication



MQL is an eco-friendly product responding to Kyoto Protocol, and capable of processing with small coolant (2~20CC/H). The use of MQL has not introduce condensation and generate dust powder even in processing with extra high speed. It also penetrates up to the tip of tools, which reduces heat generation and makes excellent lubrication. (Tools life and cutting speed are increased more than 1.5 to 3 times)

## ECO System

### Oil Skimmer

It is a device recovering lubricant mixed in coolant, which extends coolant life and provides comfortable working environment and operating cost saving.

### Mist Collector

Mist of fine particles (1~10 $\mu$ m) generated from processing will contaminate working area and ambient air, and if inhaled to human body, cause occupational disease, and also reduction of machines life and productivity. The collector catches and removes this mist to make comfortable and fresh working environment.



## Energy Saving

### Power Consumption Monitor

| POWER CONSUMPTION MONITOR |                        |         |         | 00123 N00000 |           |
|---------------------------|------------------------|---------|---------|--------------|-----------|
| ITEM                      | VALUE (LINE 9999.0000) | UNIT    | PRESENT | THRESHOLD    | THRESHOLD |
| R1                        | 14.330                 | -1.111  | 13.219  | 12.646       | 2000      |
| T1                        | 14.004                 | -0.203  | 14.601  | 25.043       | 2000      |
| Z1                        | 5.618                  | -0.556  | 5.062   | 29.902       | 2000      |
| R1                        | 21.458                 | -1.639  | 19.819  | 20.659       | 2000      |
| C1                        | 30.204                 | -6.314  | 23.890  | -15.626      | 2000      |
| R1                        | 25.000                 | -0.660  | 25.270  | 18.600       | 2000      |
| ALL                       | 107.136                | -17.400 | 149.656 | 119.970      | 10000     |

Accumulated power consumption of servo motor is displayed on OP screen, thru which you can determine real time power consumption.

### Economy Lubrication System



The use of oil saving coolant supplier provides lubricant only when the forwarding axis is moving, which saves 30% of lubricant consumption compared to existing system.