

L160/230 Series

HYUNDAI WIA CNC Turning Center



Technical Leader

L160/230 series, designed by Hyundai WIA with years of expertise and the latest technology, is a Turning Center that maximizes productivity and performance.



MODEL	Chuck Size				Bed		Turret
	6"	8"	10"	Sub 6"	Standard	Long	Turn Mill
L160A	•				•		
L160LA	•					•	
L160MA	•				•		•
L160LMA	•					•	•
L160LMSA	•			•		•	•
L230A		•			•		
L230LA		•				•	
L230MA		•			•		•
L230LMA		•				•	•
L230LMSA		•		•		•	•
L230C			•		•		
L230MC			•		•		•

Versatile, High Production CNC Turning Center

L160/L230 Series

- Shortened cycle times to improve productivity.
- Exceptionally engineered machine structure to produce various products.
- Angular ball bearing to maintain high rigidity
- Highly rigid structure designed through structural analysis
- Sub Spindle 6" chuck expands cutting capacity (Sub spindle models)
- BMT turret applied for heavy duty cutting (Mill turret models)

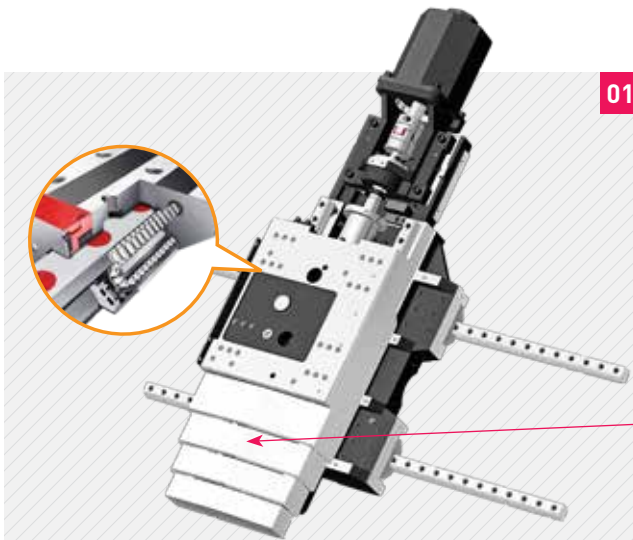


01

L160/L230

Basic Features

Main/Sub Spindle and Turret for High Productivity
Versatile CNC Turning Center



01

Guideway

L160/230 series applies roller type LM guideways in Z-axis delivering high rigidity and speed to improve productivity.

Ball Screw

Large diameter ball screws with preloading prevent deformation due to heat. Also double-anchor support method improves rigidity.

< Durability Improved by Application of **Multistage Slide Cover** >

Enlarging distance between each rail span

Previous Model (X-Axis) 200 mm(7.8")

L160/230 (X-Axis) 250 mm(10") **26% UP**

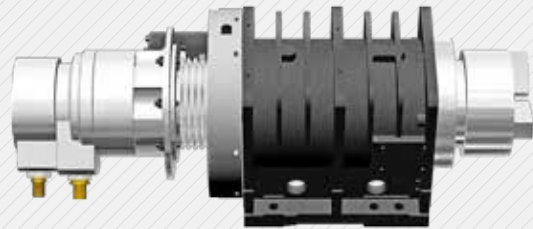
Previous Model (Z-Axis) 300 mm(11.8")

L160/230 (Z-Axis) 350 mm(13.7") **22% UP**

02

Main Spindle

Heat produced by the main spindle is blocked by applying a symmetric one-piece base and an insulation plate. This enables maintenance of high accuracy even during a long period of machining.



03

BMT Turret

The series is designed with a highly rigid BMT Turret where each holder is firmly fixed with 4 screws.

Therefore, it is possible to maintain accuracy in heavy duty machining operations.



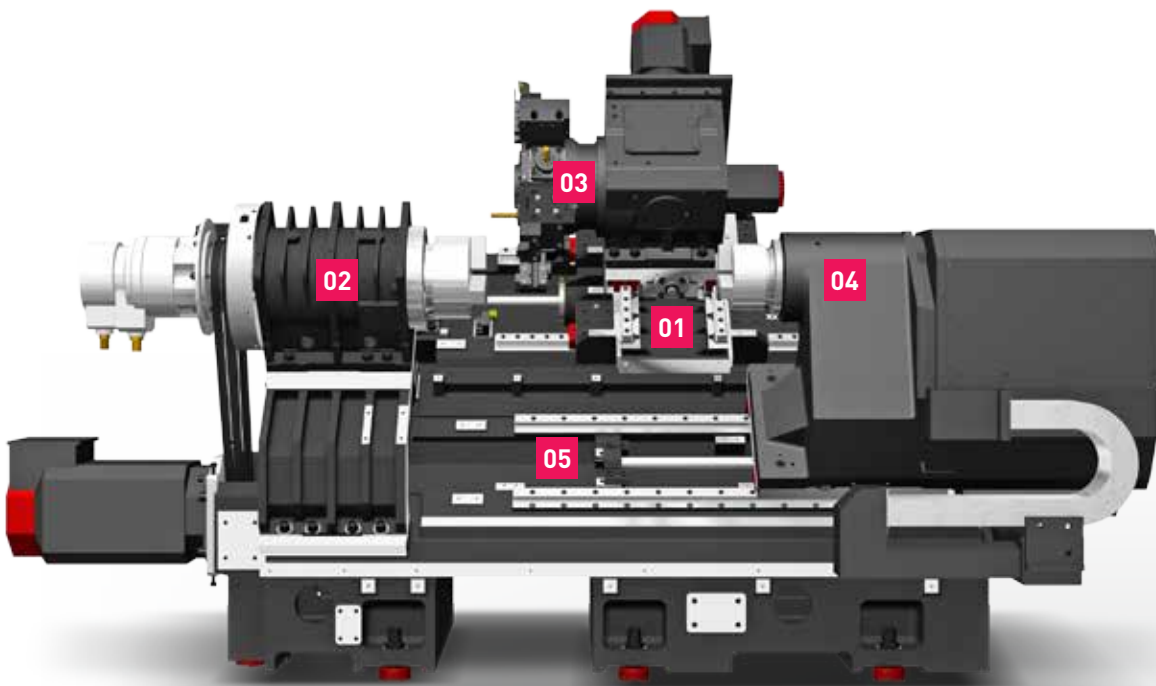
04

6" Sub Spindle

Compared to the previous model, the sub spindle size is enlarged, improving process ability.



Basic Features



05 High Precision, High Rigidity All-In-One Type of Bed

45° slant bed is designed with square and tubular rib structure. It shows excellent performance in absorbing vibration and its high rigidity enables heavy duty cutting.

One-piece Coolant Tank

The coolant tank is changed from separate structure to one-piece structure to prevent overflow and clogging. It is possible to remove chips from right side of the machine which enhances chip removal capability.

⊙ Rigidity of the Bed Enhanced by **24%** through Structural Analysis

Reduction of non-cutting time

⊙ Rapid Traverse Rate (X/Z/ZB axis)

L160LMSA | L230LMSA : **36/36/30** m/min (**1,417/1,417/1,181** ipm)

⊙ Travel (X/Z/ZB axis)

L160A : **220/460** mm (**8.7"/18.1"**) L230A | L230C : **220/440** mm (**8.7"/17.3"**)

L160MA | L230MA/MC : **220/400** mm (**8.7"/15.7"**) L160LA/LMA | L230LA/LMA : **220/560** mm (**8.7"/22"**)

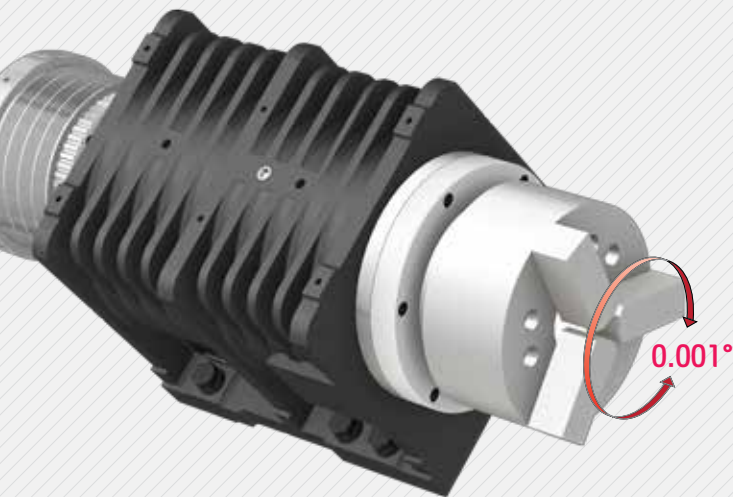
L160LMSA | L230LMSA : **220/560/590** mm (**8.7"/22"/23.2"**)

02
L160/L230

High Precision Spindle

Long Lasting High Accuracy & Excellent Performance
CNC Turning Center





Main Spindle

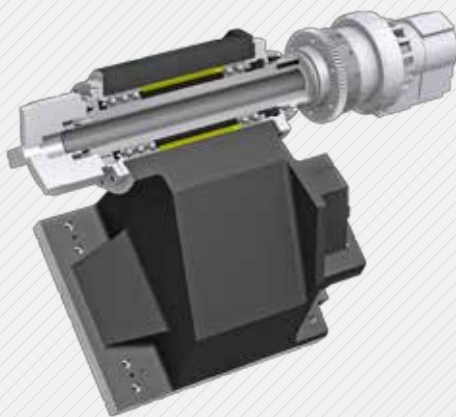
The unit is able to maintain precision for a long time where the outer bearing part is assembled to the highest precision standards. Also, stable machining is possible by AC motor which controls the spindle at constant speed.

C-Axis Control

The C axis is capable of 0.001° control when milling turret is applied. Machining capability is strengthened with turning and milling operations.

Spindle Specifications [SIEMENS]

	Chuck Size	Max Sp. Speed	Bar Capacity	Output (30min.)
L160A Series	6"	6,000[6,000] rpm	Ø45 (Ø1.8")	11[10.8] kW (14.7[14.5] HP)
L230A Series	8"	4,000[4,000] rpm	Ø65 (Ø2.6")	15[22] kW (20.1[29.5] HP)
L230C Series	10"	3,000 rpm	Ø80 (Ø3.1")	18.5 kW (25 HP)



Chuck Size : 6" C-axis Indexing : 0.001°

Bar Capacity : Ø43 (Ø1.7")

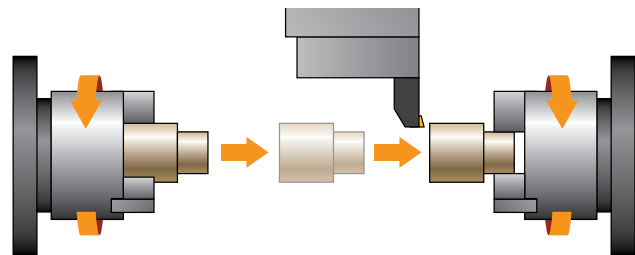
Spindle Motor

Fanuc : 5.5/3.7 kW (7.4/5 HP)

Siemens : 5.9/4.9 kW (7.9/6.6 HP)

Sub Spindle

L160LMSA/L230LMSA applies 6" sub chuck with C-axis control of 0.001°.



Machining with Sub Spindle

When the main spindle cutting is completed, the sub spindle rotation is synchronized with the main spindle allowing the workpiece to be transferred to the sub spindle, and machining can begin on the back side of the workpiece.

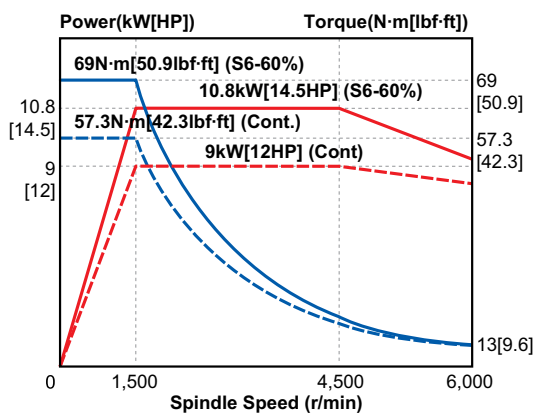


SIEMENS 1PH8 Spindle Motor

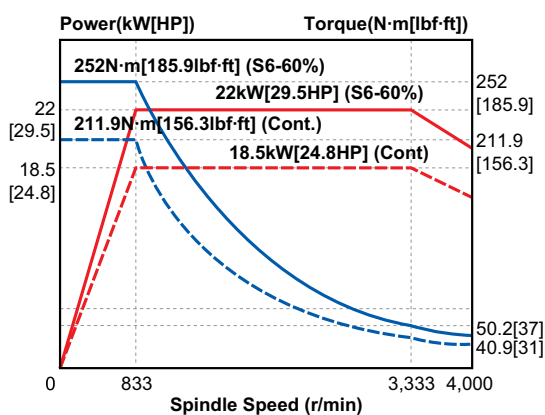
SIEMENS

The 1PH8 Series is a high quality performance motor providing concentricity of 10 μ m and fast response time. It operates smoothly in extreme environments such as high temperature, dust and dirt. The unique heat emission minimizing design makes it possible to maintain a high degree of accuracy at all times.

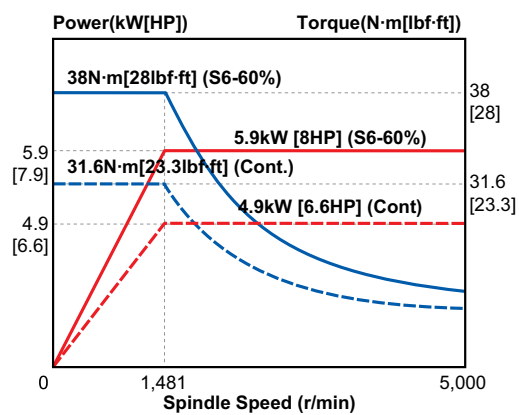
L160A Series Main Spindle



L230A Series Main Spindle

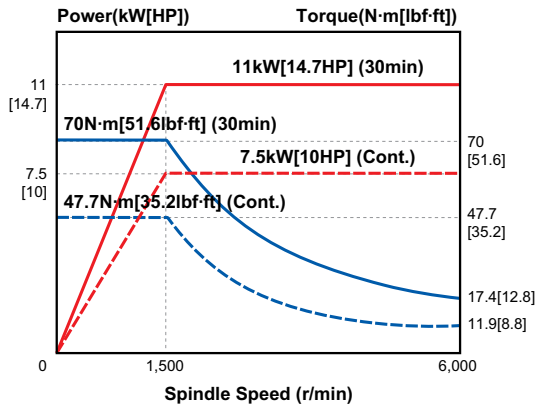


L160/230 Series Sub Spindle

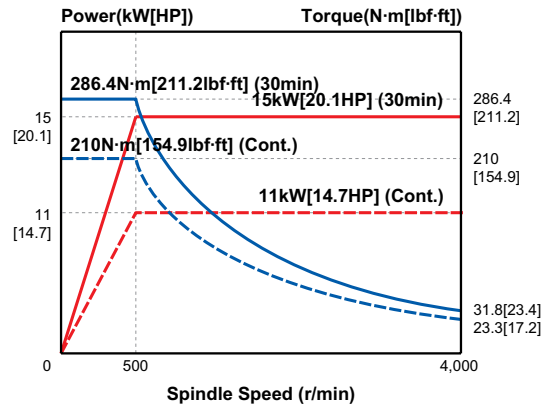


FANUC Spindle

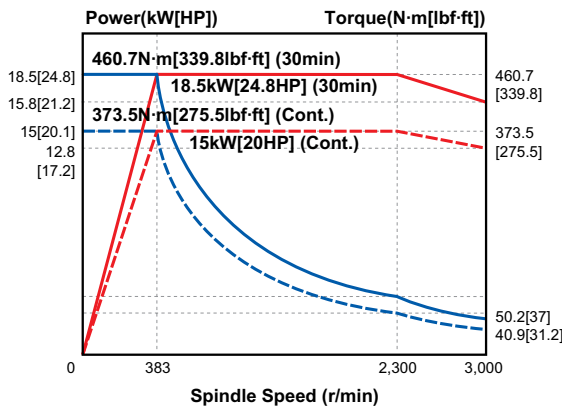
L160A Series Main Spindle



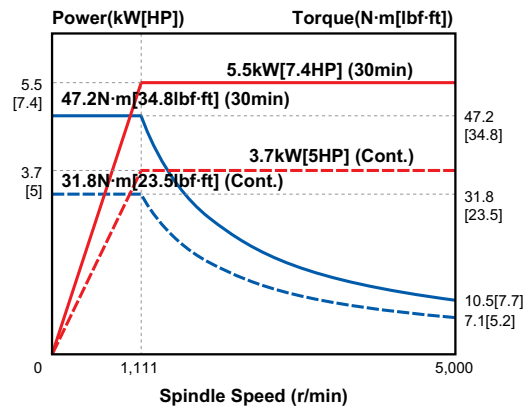
L230A Series Main Spindle



L230C Main Spindle



L160/230 Series Sub Spindle



Tail Stock

One Touch Type



Quill Type



One Touch Type

Taper : MT#4

Stroke : 400 mm (15.7") {L Type : 600 mm (23.6")}

Quill Type **OPTION**

Taper : **MT#5**

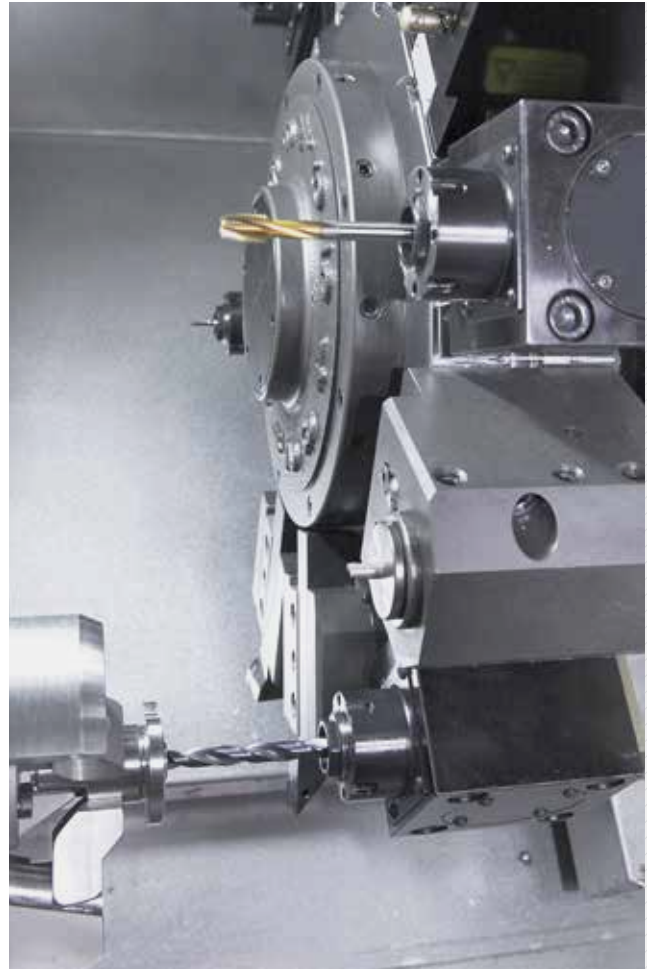
Stroke : **300+100(Quill) mm**
(11.8"+3.9"[Quill])

N3

L160/L230

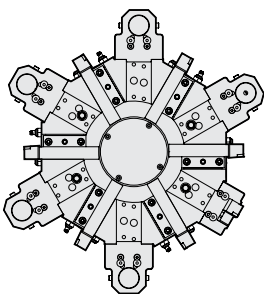
Servo Turret

High speed, High Accuracy, Highly Reliable
Servo Turret



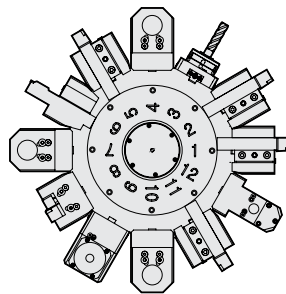
Turret

L160/230 Series has a high performance AC servo motor and 3-piece coupling attached which enhances its machining reliability. Powerful hydraulic tool clamping minimizes tool tip deviation due to load, which enhances heavy duty cutting ability.



Servo Turret

- No. of Tools : **12** EA
- Tool Size (O.D/I.D)
□25/Ø40 (□1"/Ø1.6")
- Indexing Time :
0.2 sec/step
- Turret Clamp : **49** kN



BMT55P Turret

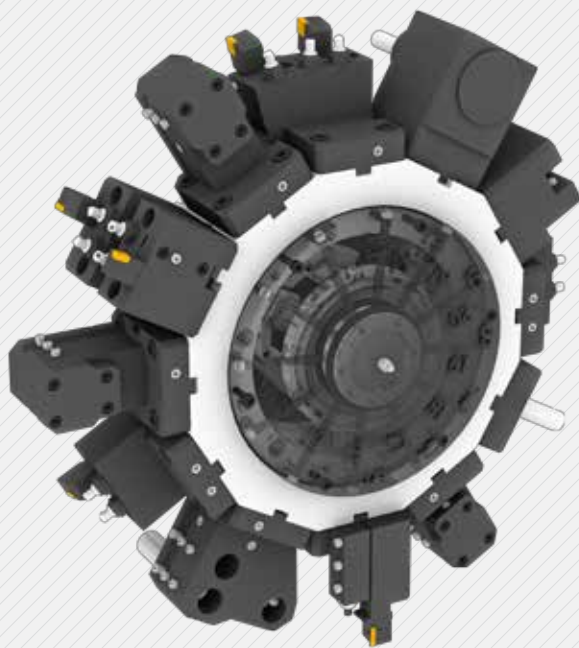
- Speed : **5,000** [5,000] rpm
- Motor (Max./Cont.) :
3.7/2.2 [3.4/2.8] kW
(5/3 [4.6/3.8] HP)
- Torque (Max./Cont.)
23.5/14.2 [21.6/17.6] N·m
(17.3/10.5 [15.9/13] lbf·ft)

◆ [SIEMENS]

Mill Turret (BMT)

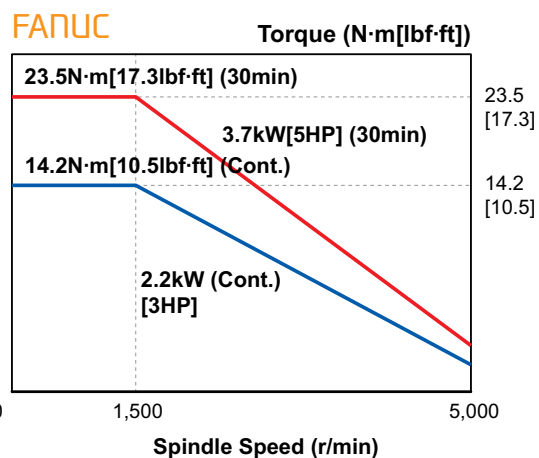
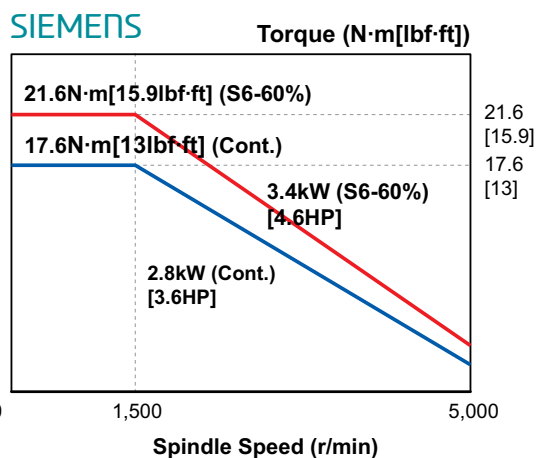
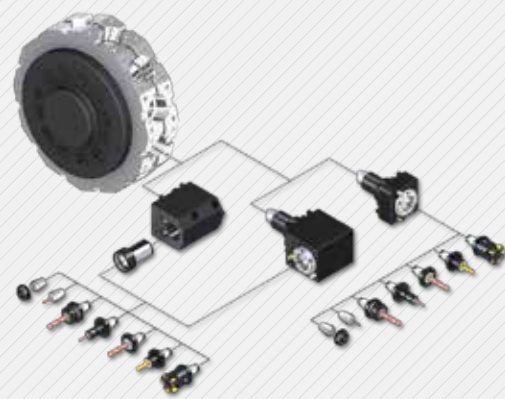
Strong clamping power is achieved by the 3-piece coupling. Also, two separate motors are used for indexing and tool rotation.

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



Mill Tool Holder

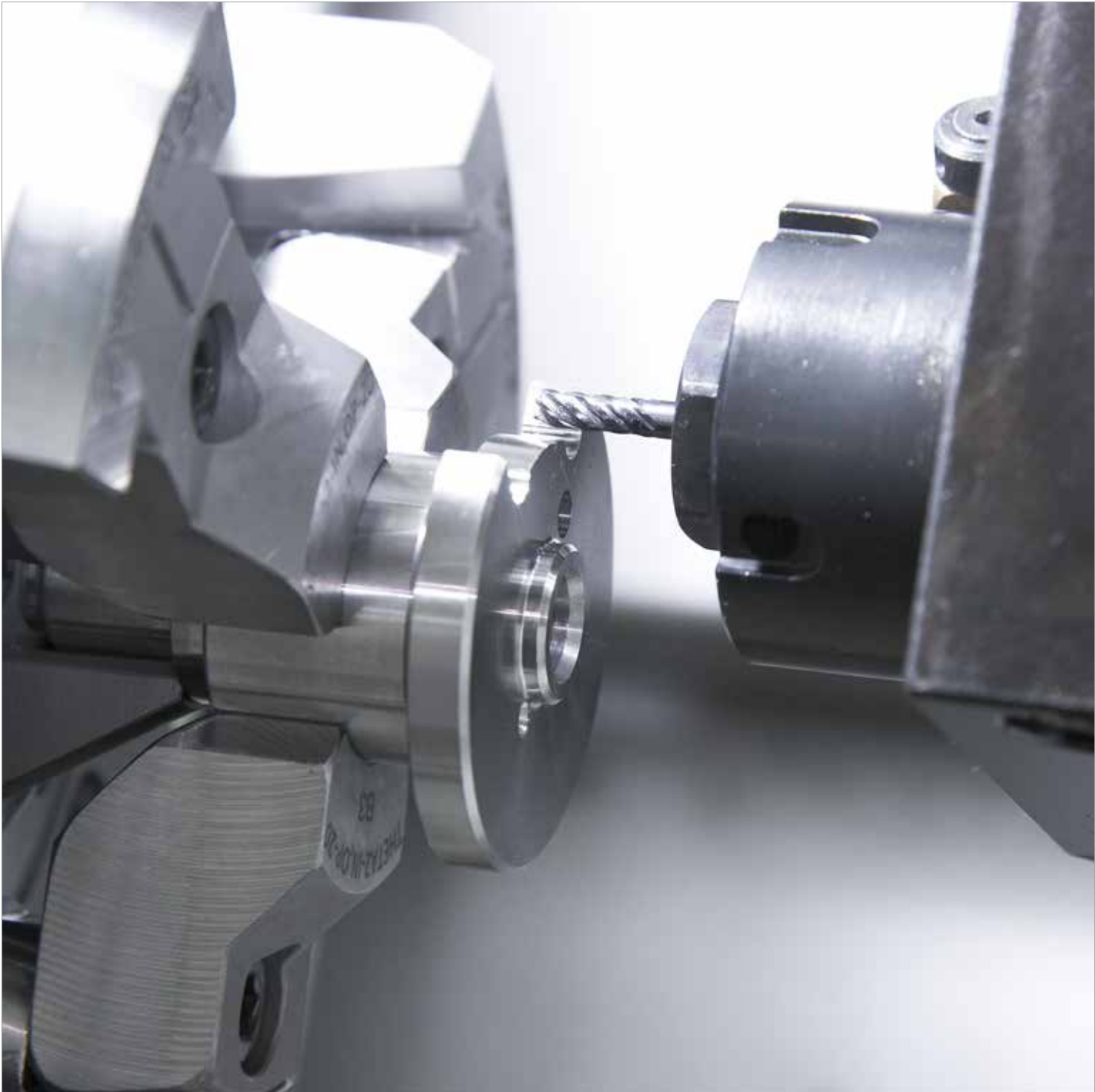
Machining capability is increased with the addition of a straight milling head which can remove material from the side of the workpiece, and an angular milling head which can perform I.D. operations.



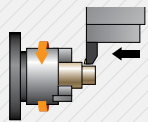
04
L160/L230

Machining Capability

Excellent Performance, High Accuracy Cutting
CNC Turning Center



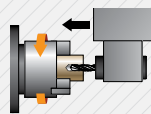
L230LMSA



Cutting (O.D)

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

Processing diameter	Ø60 (Ø2.36")
Side cutting depth	6 mm (0.24")
Cutting speed	150 m/min (5,905 ipm)
Spindle rpm	584 r/min
Forwarding speed	0.5 mm/rev
Chip discharge	450 cc/min



U-Drilling

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

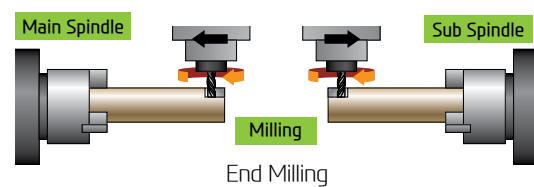
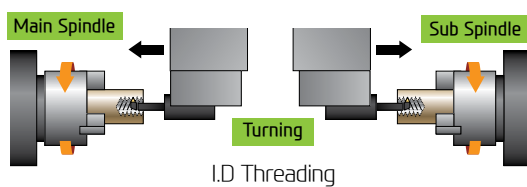
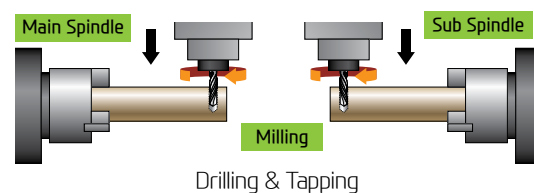
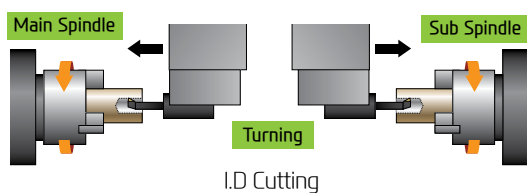
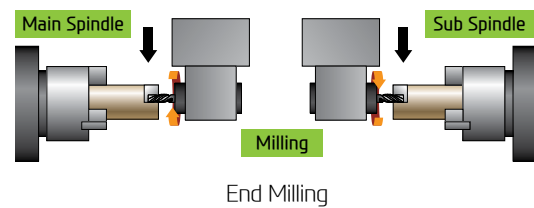
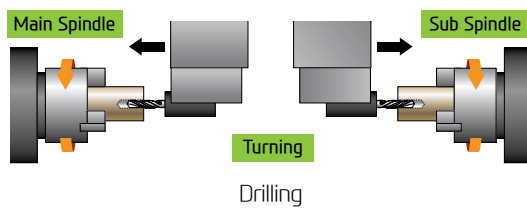
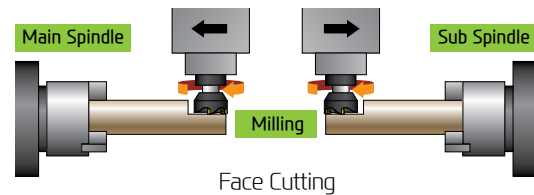
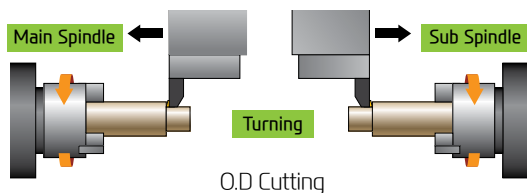
Drill diameter	Ø40 (Ø1.57")
Cutting speed	104 m/min (4,94 ipm)
Spindle rpm	828 r/min
Forwarding speed	0.3 mm/rev
Chip discharge	311 cc/min

Sample Workpiece



❖ The above result might be different by types of processing circumstance

Machining Variation



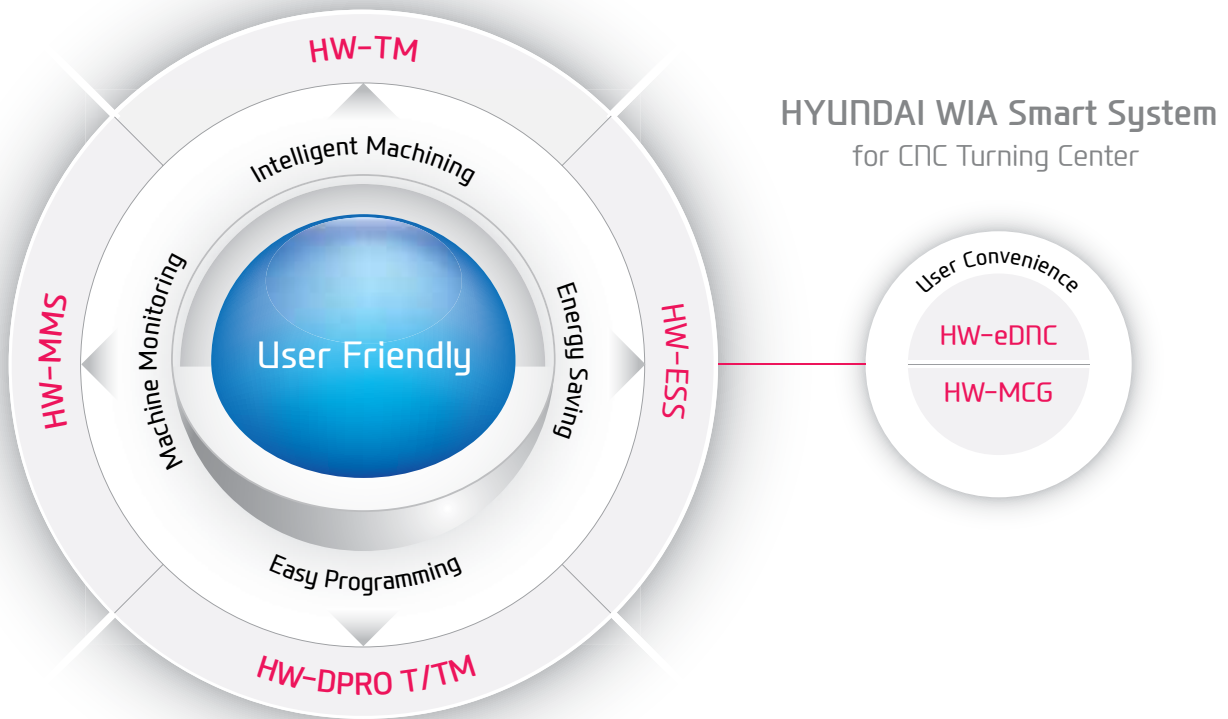
05

L160/L230

Smart System



Software for Smart Operating and Machining



HYUNDAI WIA Smart System
for CNC Turning Center

Smart Factory HW-MMS (HYUNDAI WIA-Machine Monitoring System)

A brand new manufacturing machine by HYUNDAI WIA, HW-MMS is a unique software capable of monitoring the operation status of manufacturing machines in factories, a smart solution to improve manufacturing conditions of customers.

01 Real-time monitoring of machine operation status (Cloud)

02 History and statistics of machine operation (Cloud)

03 History and statistics of alarm occurrence (Cloud)

04 History and statistics of work count (Cloud)

05 Remote diagnosis (Remote)

HW-MMS Remote System

- 01 Real-time monitoring of machine operation status (Cloud)
- 02 History and statistics of machine operation (Cloud)
- 03 History and statistics of alarm occurrence (Cloud)
- 04 History and statistics of work count (Cloud)
- 05 Remote diagnosis (Remote)

Faster processing and enhanced accuracy in are possible through the **HYUNDAI WIA Smart System**. The user friendly software and equipment monitoring of the Smart System maximizes productivity.



HW-eDNC

HYUNDAI WIA ethernet
Direct Numerical Control

This software allows transmission of NC data between PC and a machine's CNC. The processing programs can be managed on the PC through the ethernet or serial communication.



HW-MCG

HYUNDAI WIA
Machine Guidance

Software that offers operation, maintenance, management monitoring and various user friendly features.



HW-TM

HYUNDAI WIA
Tool Monitoring

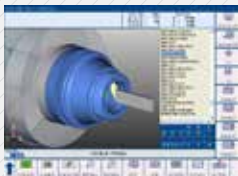
A tool monitoring software which analyzes the load of the spindle motor to determine and monitor possible damage of tools.



HW-ESS (Standard)

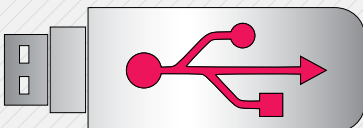
HYUNDAI WIA
Energy Saving System

An environmental friendly software that reduces the unnecessarily wasted standby power waiting for an operation.



HW-DPRO T/TM HYUNDAI WIA Dialogue PROGRAM Turn/TurnMill

Using a dialogue method, this software makes it easy to work out a program for a lathe processing operation with complicated configurations. (Can be installed on a PC.)



USB Port

Convenience is increased when inputting and outputting program. The USB port is available in addition to the former input output methods such as CF memmort card and LAN.

SIEMENS

DIFFERENTIATED CAPABILITIES, INTEGRATED ENGINEERING PERFECTLY INTERLINKED

SIEMENS 828D is a latest model CNC. It is designed for horizontal/vertical all-purpose equipments.

Its 80-bit control reduces processing time and increases productivity. The 828D is easy to maintain and run, with its easy setup functions.



SIEMENS Technology

Shop Turn

- Dialogue-type programming, simple and convenient
- Effective specifications for small quantity batch production
- Step-by-step operation possible without knowledge of the DIN/ISO code



OPTION

3D Simulation

- 3D confirmation of the completed processing configuration of the NC program is possible.
- Offers standards for 2D simulation.
- Possible to confirm the simulation of the NC program during processing.



OPTION

Easy Extend

- Easy to install/uninstall an option (Ex : barfeeder and chip conveyor, etc.)
- Possible to install in one motion without revision of individual perimeters.
- A spate list is unnecessary as option items are indicated with letters.



SIEMENS Communication Function

Variable Communication Port

RJ 45 Ethernet

USB 2.0

Compact Flash Card



Easy input/output of a program is possible as a USB memory card, a CF memory card and LAN can all be used.

ISO Code Programming



If the ISO Dialect (G291) is ordered, JIS-based G-code programs can be used. (Standard)

SIEMENS Convenience Function

Easy Tool Measuring

- Easy calculation (automatic and manual) of the offset values of the installed equipment
- Automatic input of the measured offset values of equipment into the equipment list



Work Offset Measuring

- Supports the function of work offset calculation
- Automatic application of the measured work offset value as the activated work offset



Real Time PLC Monitoring

- Real time monitoring of PLC programs is possible. Supports the "search" and "cross reference" functions.
- Real time verification of I/O variables and PLC interface
- Input/change of the values of variables



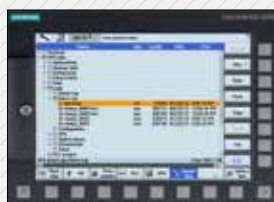
Block Searching

- Program can be re-started from a particular location without editing the processing program.
- Provides safety to the user.

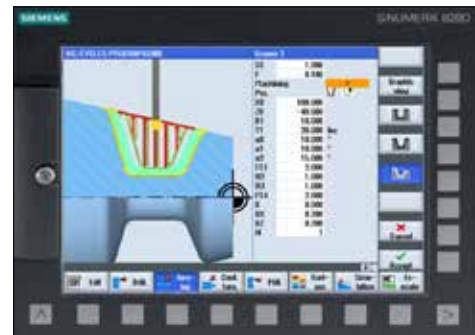


Alarm Log

- A maximum of 500 alarms can be stored.
- The entire alarm log can be stored as a data file in the I/O
- The overall alarm history can be checked through the alarm log.



SIEMENS Easy Programming



Program Guide

Simple Program, High Productivity

- Use of cycle program minimizes program capacity.
- When cycle variables are input, graphic images are provided.
- Tool path and simulation of completed cycle program are available.
- Various configurations can be processed using cycles.



Engraving Cycle

Simple Letter Processing is Possible.

- Letters can be processed on products by establishing a plane and inputting letters.
- Letter size/angle/location/direction can be designated.
- Capital and small letters of English can be processed.

n6

L160/L230

Automation System



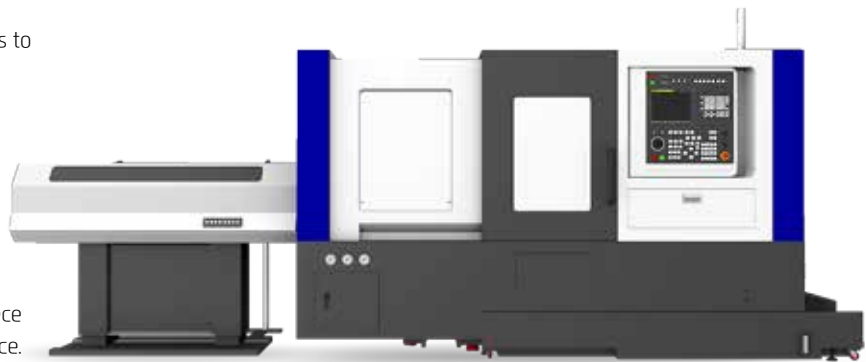
Various Devices for User Convenience

Bar Feeder System

Bar Feeder

Bar feeder system enables automation which leads to efficiency improvement.

Long Type	3 m (118.1")
Max Bar Capacity	Ø42 mm (1.7")
Short Type	1.5 m (59.1")
Max Bar Capacity	Ø65 mm (2.6")



Work Conveyor

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

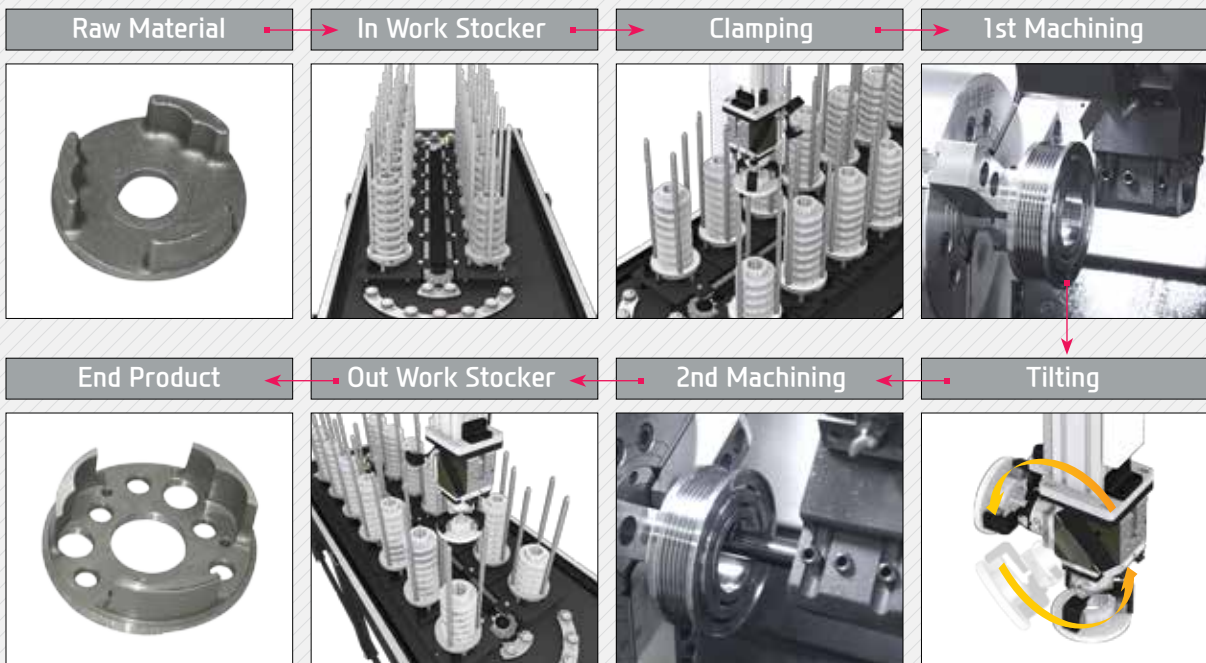


Gantry Loader System



Gantry Loader Machining Process

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



SPECIFICATIONS

L160A Series Standard & Optional

Spindle		A	MA	LA	LMA	LMSA
Main Spindle Hollow Chuck 3 Jaw	6"	●	●	●	●	●
Main Spindle Solid Chuck 3 Jaw	6"	○	○	○	○	○
Sub Spindle Hollow Chuck 3 Jaw	6"	-	-	-	-	●
Sub Spindle Solid Chuck 3 Jaw	6"	-	-	-	-	○
Standard Soft Jaw (1set)		●	●	●	●	●
Chuck Clamp Foot Switch		●	●	●	●	●
2 Steps Hyd. Pressure Device		○	○	○	○	○
Spindle Inside Stopper		☆	☆	☆	☆	☆
Main Spindle Cs-axis (0.001")		-	●	-	●	●
Sub Spindle Cs-axis (0.001")		-	-	-	-	●
Chuck Open/Close Confirmation Device		○(CE●)	○(CE●)	○(CE●)	○(CE●)	○(CE●)
2 Steps Chuck Foot Switch		☆	☆	☆	☆	☆
Sub Spindle Foot Switch		-	-	-	-	○
Turret						
Tool Holder		●	●	●	●	●
Mill Turret	BMT	-	●	-	●	●
Straight Milling Head (Axial)	Collet Type,lea	-	●	-	●	●
Angular Milling Head (Radial)	Collet Type,lea	-	●	-	●	●
Straight Milling Head (Radial)	Adapter Type	-	○	-	○	○
Angular Milling Head (Axial)	Adapter Type	-	○	-	○	○
Boring Sleeve (U-Drill Holder Sleeve)		●	●	●	●	●
Drill Socket		○	○	○	○	○
U-Drill Holder		●	●	●	●	●
U-Drill Cap		●	●	●	●	●
Angle Head		-	☆	-	☆	☆
Tail Stock & Steady Rest						
Semi Programmable Tail Stock		●	●	●	●	-
Quill Type Tail Stock (Foot Switch)	MT-5	○	○	○	○	-
Built-In Tail Stock	MT-4	☆	☆	☆	☆	-
Programmable Tail Stock		-	-	-	-	-
Standard Live Center		●	●	●	●	-
High Precision Live Center		○	○	○	○	-
2 Steps Tail Stock Pressure System		☆	☆	☆	☆	-
Quill Forward/Reverse Confirmation Device		○(CE●)	○(CE●)	○(CE●)	○(CE●)	-
Coolant & Air Blow						
Standard Coolant (Nozzle)		●	●	●	●	●
Chuck Coolant (Upper Chuck)		○	○	○	○	○
Gun Coolant		○	○	○	○	○
Through Spindle Coolant (Only for Special Chuck)		☆	☆	☆	☆	☆
Bed Flushing		○	○	○	○	○
Chuck Air Blow (Upper Chuck)		○	○	○	○	○
Sub Spindle Air Blow		-	-	-	-	○
Turret Air Blow		☆	☆	☆	☆	☆
Air Gun		○	○	○	○	○
Through Spindle Air Blow (Only for Special Chuck)		☆	☆	☆	☆	☆
High Pressure Coolant	0.4Bar (5.8psi)	●	●	●	●	●
	6Bar (87psi)	○	○	○	○	○
	20Bar (290psi)	○	○	○	○	○
Power Coolant System (For Automation)		☆	☆	☆	☆	☆
Chip Disposal						
Coolant Tank	Front (150 ℓ [39.6 gal])	●	●	-	-	-
	Front (200 ℓ /20 bar [52.8 gal /290 psi])	○	○	-	-	-
	Front (270 ℓ [71.3 gal])	-	-	●	●	●
	Rear (200 ℓ [52.8 gal])	○	○	-	-	-
	Rear (250 ℓ [66 gal])	-	-	○	○	○
Chip Conveyor (Hinge/Scraper)	Front (Right)	○	○	○	○	○
	Rear (Rear)	○	○	○	○	○
Special Chip Conveyor (Drum Filter)		☆	☆	☆	☆	☆
Chip Wagon	Standard (180 ℓ [47.5 gal])	○	○	○	○	○
	Swing (200 ℓ [52.8 gal])	○	○	○	○	○
	Large Swing (290 ℓ [76.6 gal])	○	○	○	○	○
	Large Size (330 ℓ [87.2 gal])	○	○	○	○	○
	Customized	☆	☆	☆	☆	☆

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

Safety Device		A	MA	LA	LMA	LMSA
Total Splash Guard		●	●	●	●	●
Chuck hydraulic pressure maintenance interlock		○(CE●)	○(CE●)	○(CE●)	○(CE●)	○(CE●)
Electric Device						
Call Light	1 Color : ■	●	●	●	●	●
	2 Color : ■■	○	○	○	○	○
Call Light	3 Color : ■■■	○	○	○	○	○
Call Light & Buzzer	3 Color : ■■■ B	○	○	○	○	○
Electric Cabinet Light		○	○	○	○	○
Remote MPG		-	-	-	-	-
Work Counter	Digital	○	○	○	○	○
Total Counter	Digital	○	○	○	○	○
Tool Counter	Digital	○	○	○	○	○
Multi Tool Counter	Digital	○	○	○	○	○
Electric Circuit Breaker		○	○	○	○	○
AVR (Auto Voltage Regulator)		☆	☆	☆	☆	☆
Transformer	25kVA	○	○	○	○	-
	30kVA	-	-	-	-	○
Auto Power Off		○	○	○	○	○
Measurement						
Q-Setter		○	○	○	○	○
Automatic Q-Setter		●	●	●	●	●
Work Close Confirmation Device (Only for Special Chuck)	TACO	○	○	○	○	○
	SMC	○	○	○	○	○
Work Setter		☆	☆	☆	☆	☆
Linear Scale	X Axis	○	○	○	○	○
	Z Axis	○	○	○	○	○
Coolant Level Sensor (Only for Chip Conveyor)		☆	☆	☆	☆	☆
Environment						
Air Conditioner	FANUC	○	○	○	○	○
	SIEMENS	●	●	●	●	●
Oil Mist Collector		☆	☆	☆	☆	☆
Oil-Water Separation Device		●	●	●	●	●
Oil Skimmer		○	○	○	○	○
MLQ (Minimal Quantity Lubrication)		☆	☆	☆	☆	☆
Fixture & Automation						
Auto Door	High Speed	○	○	○	○	○
Auto Shutter (Only for Automatic System)		○	○	○	○	○
Sub Operation Panel		☆	☆	☆	☆	☆
Bar Feeder Interface		○	○	○	○	○
Bar Feeder (FEDEK)		☆	☆	☆	☆	☆
Extra M-Code 4ea		○	○	○	○	○
Automation Interface		☆	☆	☆	☆	☆
I/O Extension (IN & OUT)	16 Contact	○	○	○	○	○
	32 Contact	○	○	○	○	○
Parts Catcher		○	○	○	○	○
Sub Spindle Work Pusher (Spring Type)		-	-	-	-	○
Sub Spindle Work Ejector (Pneumatic Type)		-	-	-	-	○
Turret Work Pusher (For Automation)		☆	☆	☆	☆	☆
Parts Conveyor (Main Part Catcher Application)		○	○	○	○	○
Semi Automation System		☆	☆	☆	☆	☆
Hyd. Device						
Standard Hyd. Cylinder	Hollow	●	●	●	●	●
Standard Hyd. Unit	35bar (507.6 psi)/ 18 ℓ (4.8gal)	●	●	●	●	●
S/W						
Machine Guidance (HW-MCG)		☆	☆	☆	☆	☆
Energy Saving System (HW-ESS)		●	●	●	●	●
Tool Monitoring (HW-TM)		○	○	○	○	○
DNC software (HW-eDNC)		○	○	○	○	○
Machine Monitoring System (HW-MMS)		☆	☆	☆	☆	☆
Conversational Program (HW-DPRO)		○	○	○	○	-
ETC						
Tool Box		●	●	●	●	●
Customized Color	Need Munsel No.	☆	☆	☆	☆	☆
CAD & CAM		☆	☆	☆	☆	☆

SPECIFICATIONS

L230A Series Standard & Optional

Spindle		A	MA	LA	LMA	LMSA
Main Spindle Hollow Chuck 3 Jaw	8"	●	●	●	●	●
Main Spindle Solid Chuck 3 Jaw	8"	○	○	○	○	○
Sub Spindle Hollow Chuck 3 Jaw	6"	-	-	-	-	●
Sub Spindle Solid Chuck 3 Jaw	6"	-	-	-	-	○
Standard Soft Jaw (1set)		●	●	●	●	●
Chuck Clamp Foot Switch		●	●	●	●	●
2 Steps Hyd. Pressure Device		○	○	○	○	○
Spindle Inside Stopper		☆	☆	☆	☆	☆
Main Spindle Cs-axis (0.001")		-	●	-	●	●
Sub Spindle Cs-axis (0.001")		-	-	-	-	●
Chuck Open/Close Confirmation Device		○(CE:●)	○(CE:●)	○(CE:●)	○(CE:●)	○(CE:●)
2 Steps Chuck Foot Switch		☆	☆	☆	☆	☆
Sub Spindle Foot Switch		-	-	-	-	○
Turret						
Tool Holder		●	●	●	●	●
Mill Turret	BMT	-	●	-	●	●
Straight Milling Head (Axial)	Collet Type, 1ea	-	●	-	●	●
Angular Milling Head (Radial)	Collet Type, 1ea	-	●	-	●	●
Straight Milling Head (Radial)	Adapter Type	-	○	-	○	○
Angular Milling Head (Axial)	Adapter Type	-	○	-	○	○
Boring Sleeve (U-Drill Holder Sleeve)		●	●	●	●	●
Drill Socket		○	○	○	○	○
U-Drill Holder		●	●	●	●	●
U-Drill Cap		●	●	●	●	●
Angle Head		-	☆	-	☆	☆
Tail Stock & Steady Rest						
Semi Programmable Tail Stock		●	●	●	●	-
Quill Type Tail Stock (Foot Switch)	MT-5	○	○	☆	☆	-
Built-In Tail Stock	MT-4	☆	☆	☆	☆	-
Programmable Tail Stock		-	-	-	-	-
Standard Live Center		●	●	●	●	-
High Precision Live Center		○	○	○	○	-
2 Steps Tail Stock Pressure System		☆	☆	☆	☆	-
Quill Forward/Reverse Confirmation Device		○(CE:●)	○(CE:●)	○(CE:●)	○(CE:●)	-
Coolant & Air Blow						
Standard Coolant (Nozzle)		●	●	●	●	●
Chuck Coolant (Upper Chuck)		○	○	○	○	○
Gun Coolant		○	○	○	○	○
Through Spindle Coolant (Only for Special Chuck)		☆	☆	☆	☆	☆
Bed Flushing		○	○	○	○	○
Chuck Air Blow (Upper Chuck)		○	○	○	○	○
Sub Spindle Air Blow		-	-	-	-	○
Turret Air Blow		☆	☆	☆	☆	☆
Air Gun		○	○	○	○	○
Through Spindle Air Blow (Only for Special Chuck)		☆	☆	☆	☆	☆
High Pressure Coolant	0.4Bar (5.8psi)	●	●	●	●	●
	6Bar (87psi)	○	○	○	○	○
	20Bar (290psi)	○	○	○	○	○
Power Coolant System (For Automation)		☆	☆	☆	☆	☆
Chip Disposal						
Coolant Tank	Front (150 ℓ [39.6 gal])	●	●	-	-	-
	Front (200 ℓ /20 bar [52.8 gal /290 psi])	○	○	-	-	-
	Front (270 ℓ [71.3 gal])	-	-	●	●	●
	Rear (200 ℓ [52.8 gal])	○	○	-	-	-
	Rear (250 ℓ [66 gal])	-	-	○	○	○
Chip Conveyor (Hinge/Scraper)	Front (Right)	○	○	○	○	○
	Rear (Rear)	○	○	○	○	○
Special Chip Conveyor (Drum Filter)		☆	☆	☆	☆	☆
Chip Wagon	Standard (180 ℓ [47.5 gal])	○	○	○	○	○
	Swing (200 ℓ [52.8 gal])	○	○	○	○	○
	Large Swing (290 ℓ [76.6 gal])	○	○	○	○	○
	Large Size (330 ℓ [87.2 gal])	○	○	○	○	○
	Customized	☆	☆	☆	☆	☆

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

Safety Device		A	MA	LA	LMA	LMSA
Total Splash Guard		●	●	●	●	●
Chuck hydraulic pressure maintenance interlock		○(CE:●)	○(CE:●)	○(CE:●)	○(CE:●)	○(CE:●)
Electric Device						
Call Light	1 Color : ●	●	●	●	●	●
Call Light	2 Color : ●	○	○	○	○	○
Call Light	3 Color : ●	○	○	○	○	○
Call Light & Buzzer	3 Color : ● B	○	○	○	○	○
Electric Cabinet Light		○	○	○	○	○
Remote MPG		-	-	-	-	-
Work Counter	Digital	○	○	○	○	○
Total Counter	Digital	○	○	○	○	○
Tool Counter	Digital	○	○	○	○	○
Multi Tool Counter	Digital	○	○	○	○	○
Electric Circuit Breaker		○	○	○	○	○
AVR (Auto Voltage Regulator)		☆	☆	☆	☆	☆
Transformer	25KVA	○	-	○	-	-
	30KVA	-	○	-	○	-
	35KVA	-	-	-	-	○
Auto Power Off		○	○	○	○	○
Measurement						
Q-Setter		○	○	○	○	○
Automatic Q-Setter		●	●	●	●	●
Work Close Confirmation Device (Only for Special Chuck)	TACO	○	○	○	○	○
	SMC	○	○	○	○	○
Work Setter		☆	☆	☆	☆	☆
Linear Scale	X Axis	○	○	○	○	○
	Z Axis	○	○	○	○	○
Coolant Level Sensor (Only for Chip Conveyor)		☆	☆	☆	☆	☆
Environment						
Air Conditioner	FANUC	○	○	○	○	○
	SIEMENS	●	●	●	●	●
Oil Mist Collector		☆	☆	☆	☆	☆
Oil-Water Separation Device		●	●	●	●	●
Oil Skimmer		○	○	○	○	○
MQL (Minimal Quantity Lubrication)		☆	☆	☆	☆	☆
Fixture & Automation						
Auto Door	High Speed	○	○	○	○	○
Auto Shutter (Only for Automatic System)		○	○	○	○	○
Sub Operation Pannel		☆	☆	☆	☆	☆
Bar Feeder Interface		○	○	○	○	○
Bar Feeder (FEDEK)		☆	☆	☆	☆	☆
Extra M-Code 4ea		○	○	○	○	○
Automation Interface		☆	☆	☆	☆	☆
I/O Extension (IN & OUT)	16 Contact	○	○	○	○	○
	32 Contact	○	○	○	○	○
Parts Catcher		○	○	○	○	○
Sub Spindle Work Pusher (Spring Type)		-	-	-	-	○
Sub Spindle Work Ejector (Pneumatic Type)		-	-	-	-	○
Turret Work Pusher (For Automation)		☆	☆	☆	☆	☆
Parts Conveyor (Main Part Catcher Application)		○	○	○	○	○
Semi Automation System		☆	☆	☆	☆	☆
Hyd. Device						
Standard Hyd. Cylinder	Hollow	●	●	●	●	●
Standard Hyd. Unit	35bar (507.6 psi)/ 18 ℓ (4.8gal)	●	●	●	●	●
S/W						
Machine Guidance (HW-MCG)		☆	☆	☆	☆	☆
Energy Saving System (HW-ESS)		●	●	●	●	●
Tool Monitoring (HW-TM)		○	○	○	○	○
DTC software (HW-eDTC)		○	○	○	○	○
Machine Monitoring System (HW-MMS)		☆	☆	☆	☆	☆
Conversational Program (HW-DPRO)		○	○	○	○	-
ETC						
Tool Box		●	●	●	●	●
Customized Color	Need Munsel No.	☆	☆	☆	☆	☆
CAD & CAM		☆	☆	☆	☆	☆

SPECIFICATIONS

L230C/MC Standard & Optional

Spindle		C	MC
Main Spindle Hollow Chuck 3 Jaw	10"	●	●
Main Spindle Solid Chuck 3 Jaw	10"	○	○
Sub Spindle Hollow Chuck 3 Jaw	6"	-	-
Sub Spindle Solid Chuck 3 Jaw	6"	-	-
Standard Soft Jaw (1set)		●	●
Chuck Clamp Foot Switch		●	●
2 Steps Hyd. Pressure Device		○	○
Spindle Inside Stopper		☆	☆
Main Spindle Cs-axis (0.001")		-	●
Sub Spindle Cs-axis (0.001")		-	-
Chuck Open/Close Confirmation Device		○ (CE:●)	○ (CE:●)
2 Steps Chuck Foot Switch		☆	☆
Sub Spindle Foot Switch		-	-
Turret			
Tool Holder		●	●
Mill Turret	BMT	-	●
Straight Milling Head (Axial)	Collet Type,lea	-	●
Angular Milling Head (Radial)	Collet Type,lea	-	●
Straight Milling Head (Radial)	Adapter Type	-	○
Angular Milling Head (Axial)	Adapter Type	-	○
Boring Sleeve (U-Drill Holder Sleeve)		●	●
Drill Socket		○	○
U-Drill Holder		●	●
U-Drill Cap		●	●
Angle Head		-	☆
Tail Stock & Steady Rest			
Semi Programmable Tail Stock		●	●
Quill Type Tail Stock (Foot Switch)	MT-5	○	○
Built-In Tail Stock	MT-4	☆	☆
Programmable Tail Stock		-	-
Standard Live Center		●	-
High Precision Live Center		○	-
2 Steps Tail Stock Pressure System		☆	☆
Quill Forward/Reverse Confirmation Device		○ (CE:●)	○ (CE:●)
Coolant & Air Blow			
Standard Coolant (Nozzle)		●	●
Chuck Coolant (Upper Chuck)		○	○
Gun Coolant		○	○
Through Spindle Coolant (Only for Special Chuck)		☆	☆
Bed Flushing		○	○
Chuck Air Blow (Upper Chuck)		○	○
Sub Spindle Air Blow		-	-
Turret Air Blow		☆	☆
Air Gun		○	○
Through Spindle Air Blow (Only for Special Chuck)		☆	☆
High Pressure Coolant	0.4Bar (5.8psi)	●	●
	6Bar (87psi)	○	○
	20Bar (290psi)	○	○
Power Coolant System (For Automation)		☆	☆
Chip Disposal			
Coolant Tank	Front (150 ℓ [39.6 gal])	●	●
	Front (200 ℓ /20 bar [52.8 gal /290 psi])	○	○
	Rear (200 ℓ [52.8gal])	○	○
Chip Conveyor (Hinge/Scraper)	Front (Right)	○	○
	Rear (Rear)	○	○
Special Chip Conveyor (Drum Filter)		☆	☆
Chip Wagon	Standard (180 ℓ [47.5 gal])	○	○
	Swing (200 ℓ [52.8 gal])	○	○
	Large Swing (290 ℓ [76.6 gal])	○	○
	Large Size (330 ℓ [87.2 gal])	○	○
	Customized	☆	☆

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

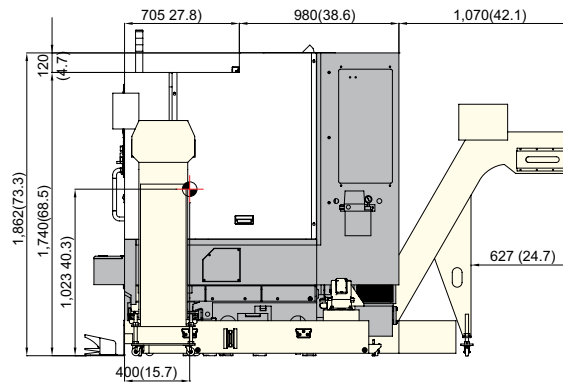
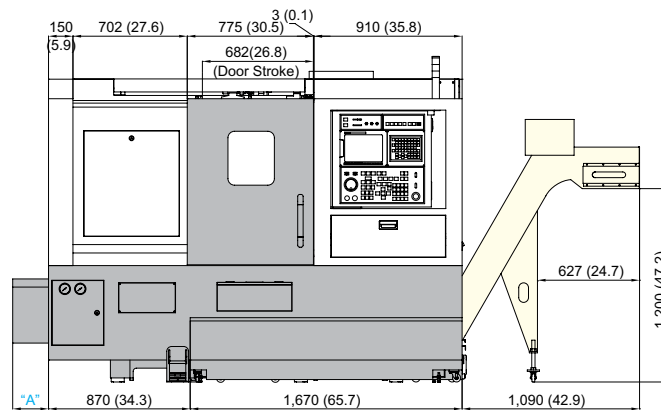
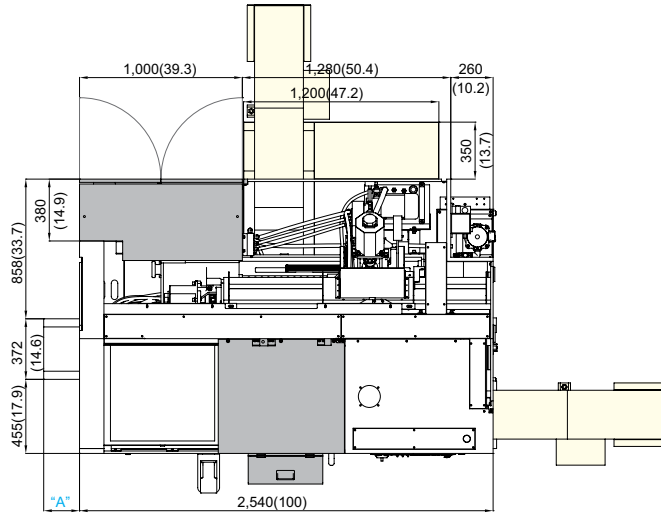
Safety Device		C	MC
Total Splash Guard		●	●
Chuck hydraulic pressure maintenance interlock		○ (CE:●)	○ (CE:●)
Electric Device			
Call Light	1 Color : ■	●	●
Call Light	2 Color : ■ ■	○	○
Call Light	3 Color : ■ ■ ■	○	○
Call Light & Buzzer	3 Color : ■ ■ ■ B	○	○
Electric Cabinet Light		○	○
Remote MPG		-	-
Work Counter	Digital	○	○
Total Counter	Digital	○	○
Tool Counter	Digital	○	○
Multi Tool Counter	Digital	○	○
Electric Circuit Breaker		○	○
AVR (Auto Voltage Regulator)		☆	☆
Transformer	30kVA	○	○
Auto Power Off		○	○
Measurement			
Q-Setter		○	○
Automatic Q-Setter		●	●
Work Close Confirmation Device (Only for Special Chuck)	TACO	○	○
	SMC	○	○
Work Setter		☆	☆
Linear Scale	X Axis	○	○
	Z Axis	○	○
Coolant Level Sensor (Only for Chip Conveyor)		☆	☆
Environment			
Air Conditioner	FANUC	○	○
	SIEMENS	●	●
Oil Mist Collector		☆	☆
Oil-Water Separation Device		●	●
Oil Skimmer		○	○
MQL (Minimal Quantity Lubrication)		☆	☆
Fixture & Automation			
Auto Door	High Speed	○	○
Auto Shutter (Only for Automatic System)		○	○
Sub Operation Pannel		☆	☆
Bar Feeder Interface		○	○
Bar Feeder (FEDEK)		☆	☆
Extra M-Code 4ea		○	○
Automation Interface		☆	☆
I/O Extension (IN & OUT)	16 Contact	○	○
	32 Contact	○	○
Parts Catcher		○	○
Sub Spindle Work Pusher (Spring Type)		-	-
Sub Spindle Work Ejector (Pneumatic Type)		-	-
Turret Work Pusher (For Automation)		☆	☆
Parts Conveyor (Main Part Catcher Application)		○	○
Semi Automation System		☆	☆
Hyd. Device			
Standard Hyd. Cylinder	Hollow	●	●
Standard Hyd. Unit	35bar (507.6 psi)/ 18 ℓ (4.8gal)	●	●
S/W			
Machine Guidance (HW-MCG)		☆	☆
Energy Saving System (HW-ESS)		●	●
Tool Monitoring (HW-TM)		○	○
DNC software (HW-eDNC)		○	○
Machine Monitoring System (HW-MMS)		☆	☆
Conversational Program (HW-DPRO)		☆	☆
ETC			
Tool Box		●	●
Customized Color	Need Munsel No.	☆	☆
CAD & CAM		☆	☆

SPECIFICATIONS

External Dimensions

unit : mm(in)

L160A/MA L230A/MA L230C/MC



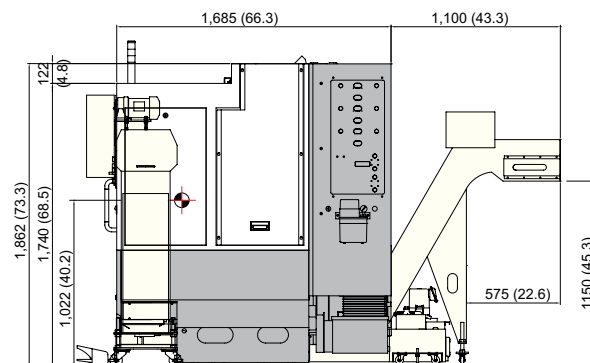
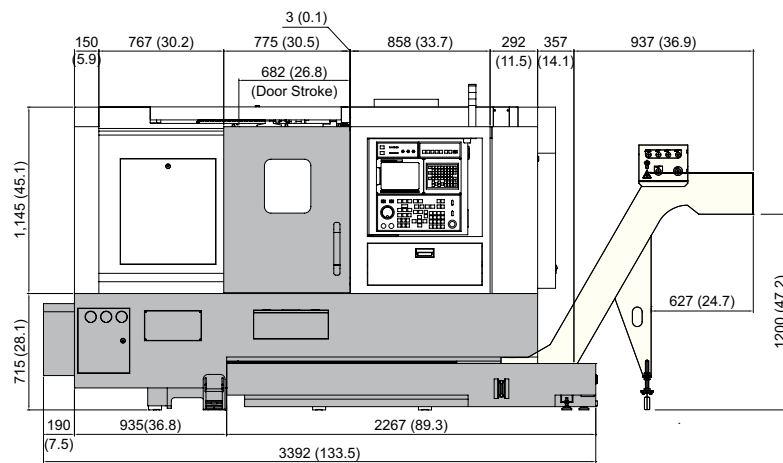
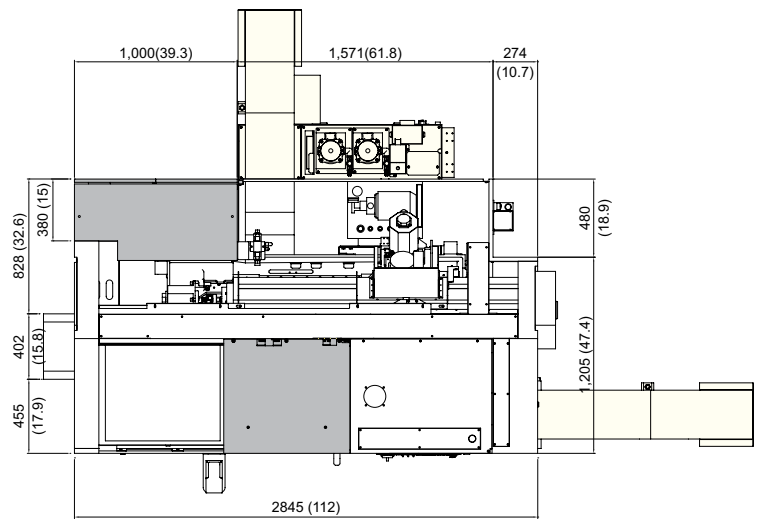
A L160A : 190mm(7.5") L230A : 220mm(8.7") L230C : 360mm(14.2")

SPECIFICATIONS

External Dimensions

unit : mm(in)

L160LA/LMA/LMSA L230LA/LMA/LMSA



SPECIFICATIONS

Tooling System

unit : mm(in)



L160/230 Series Tooling Parts Detail

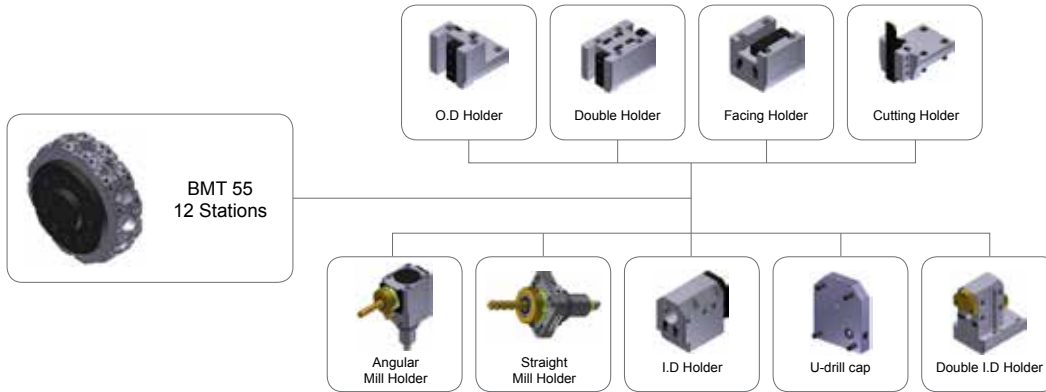
ITEM			A/LA		L230C/LC	
			mm Unit	inch Unit	mm Unit	inch Unit
Turning Holder	O.D Holder	Right/Left	-	-	-	-
		Extension	-	-	1	1
	Facing Holder		1	1	1	1
	Cutting Holder		-	-	-	-
Boring Holder	I.D Holder	Single	5	5	5	5
	U-Drill Holder	Cap	1	1	1	1
Driven Holder	Straight Mill Holder	Standard	-	-	-	-
		TTC (Tool through coolant)	-	-	-	-
	Angular Mill Holder	Standard	-	-	-	-
		TTC (Tool through coolant)	-	-	-	-
Socket	Boring (mm)	Ø10 (Ø3/8")	1	-	1	-
		Ø12 (Ø1/2")	1	1	1	1
		Ø16 (Ø5/8")	1	-	1	-
		Ø20 (Ø3/4")	1	1	1	1
		Ø25 (Ø1")	1	1	1	1
		Ø32 (Ø1 1/4")	1	1	1	1
	Drill	MT 1 x MT 2	Opt.	Opt.	Opt.	Opt.
		MT 2	1	1	1	1

Specifications are subject to change without notice for improvement.

SPECIFICATIONS

Tooling System

unit : mm(in)



L160/230 Series Tooling Parts Detail

ITEM			MA/LMA/230MC		LMSA	
			mm Unit	inch Unit	mm Unit	inch Unit
Turning Holder	O.D Holder	Right/Left	4	4	2	2
		Double	-	-	1	1
	Facing Holder		1	1	1	1
	Cutting Holder		1	-	1	1
Boring Holder	I.D Holder	Single	4	4	4	4
		Double	-	-	1	1
Driven Holder	U-Drill Holder	Cap (Single)	1	1 (L160 : Opt.)	1	1
		Cap (Double)	-	-	Opt.	Opt.
	Straight Mill Holder	Standard	1	1	1	1
		TTC (Tool through coolant)	Opt.	Opt.	Opt.	Opt.
	Angular Mill Holder	Standard	1	1	1	1
		TTC (Tool through coolant)	Opt.	Opt.	Opt.	Opt.
Socket	Boring	Ø10 (Ø3/8")	1	1	1	1
		Ø12 (Ø1/2")	1	1	1	1
		Ø16 (Ø5/8")	1	1	1	1
		Ø20 (Ø3/4")	1	1	1	1
		Ø25 (Ø1")	1	1	1	1
		Ø32 (Ø1 1/4")	1	1	1	1
		Ø8×Ø20 (Ø5/16"×Ø3/4")	-	-	1	1
		Ø12×Ø20 (Ø1/2"×Ø3/4")	-	-	1	1
	Drill	MT 1 x MT 2	Opt.	Opt.	Opt.	Opt.
		MT 2	Opt.	Opt.	Opt.	Opt.
		MT 3	Opt.	Opt.	Opt.	Opt.
	ER Collet	ER25	1 Set	1 Set	1 Set	1 Set

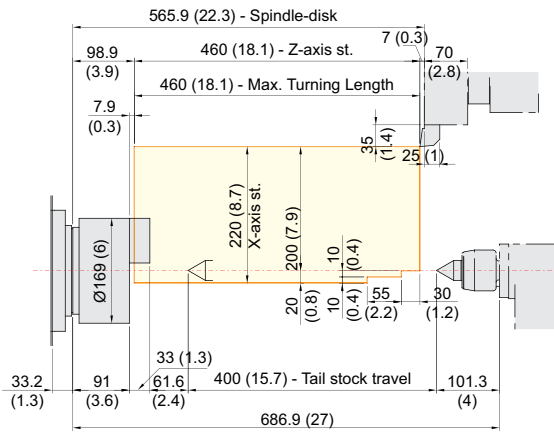
SPECIFICATIONS

Tooling Travel Range

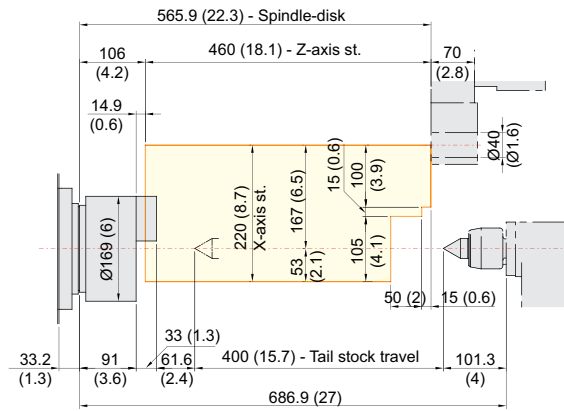
unit : mm(in)

L160A

OD tool

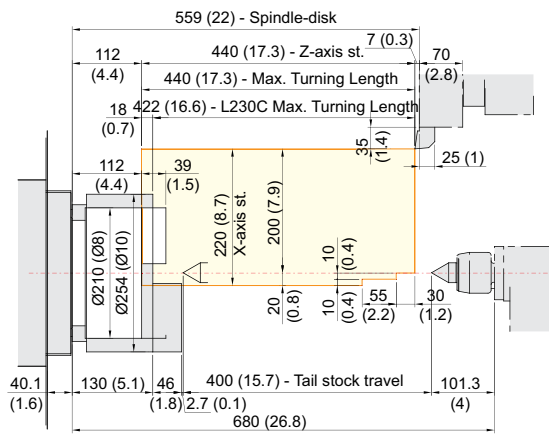


ID tool

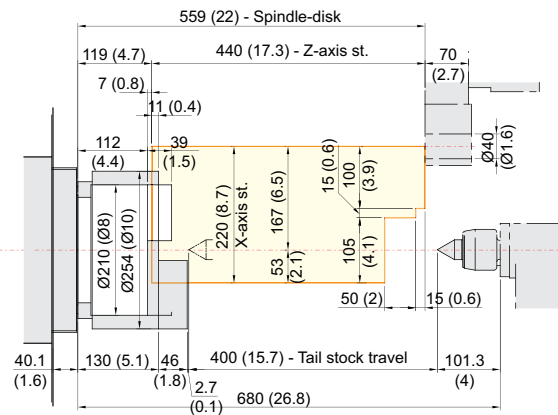


L230A/C

OD tool



ID tool



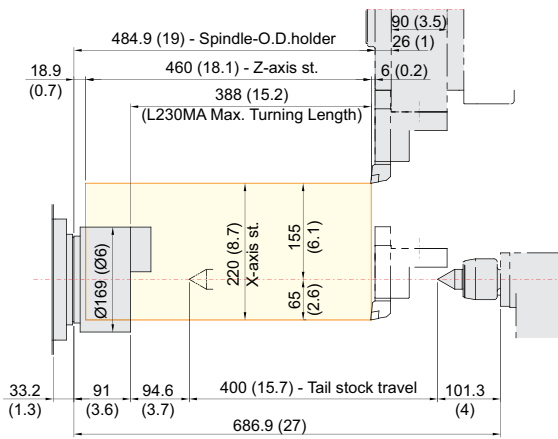
SPECIFICATIONS

Tooling Travel Range

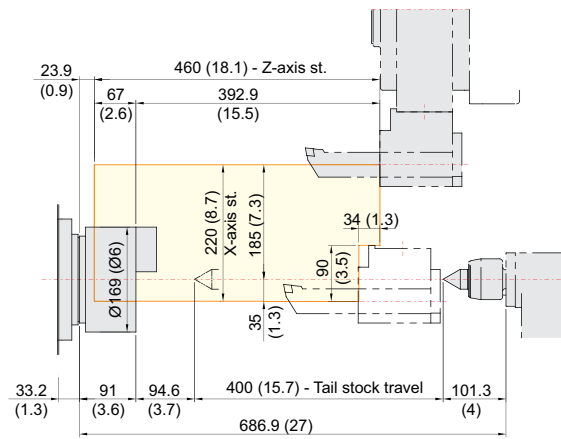
unit : mm(in)

L160MA

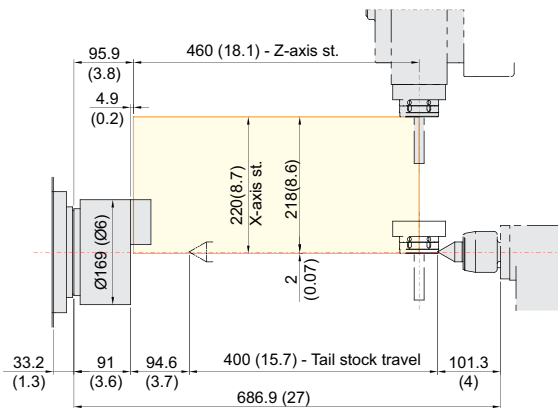
OD tool



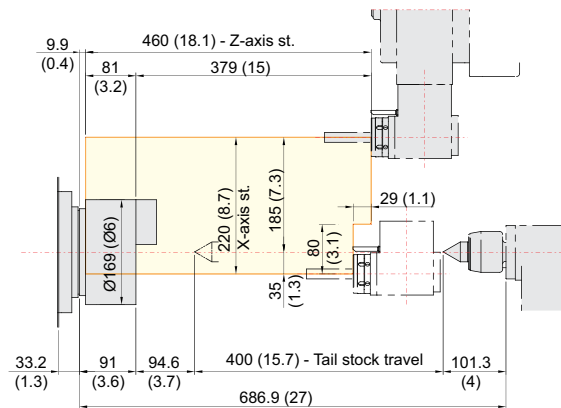
ID tool



Straight Mill Holder



Angular Mill Holder



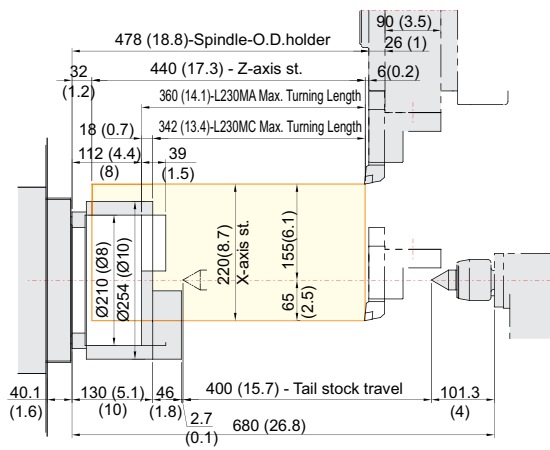
SPECIFICATIONS

Tooling Travel Range

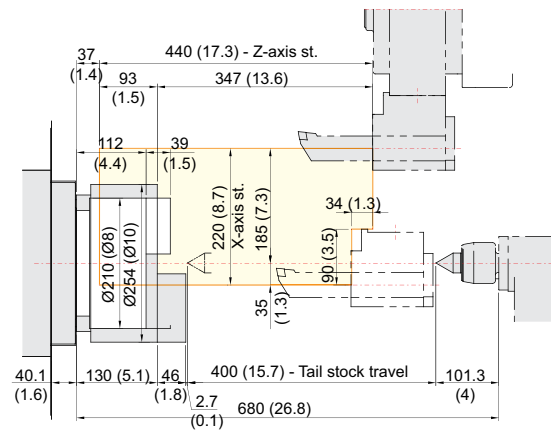
unit : mm(in)

L230MA/MC

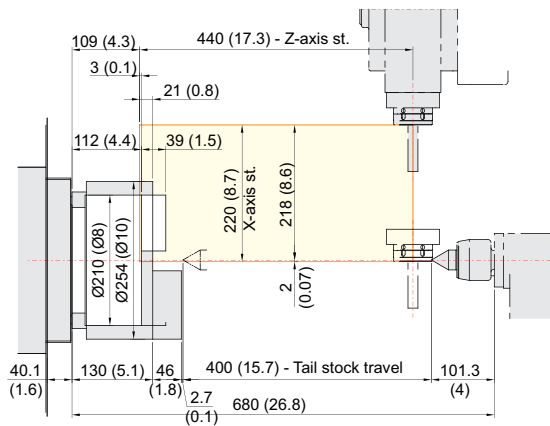
OD tool



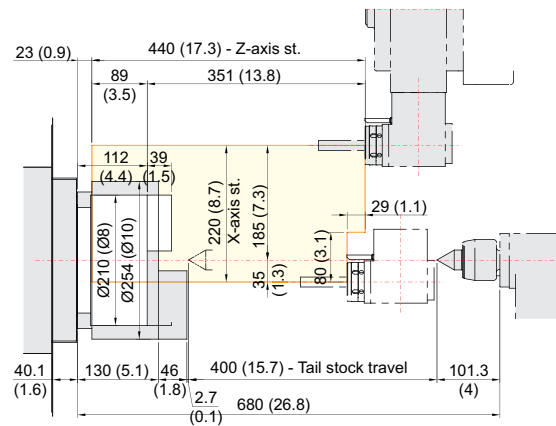
ID tool



Straight Mill Holder



Angular Mill Holder



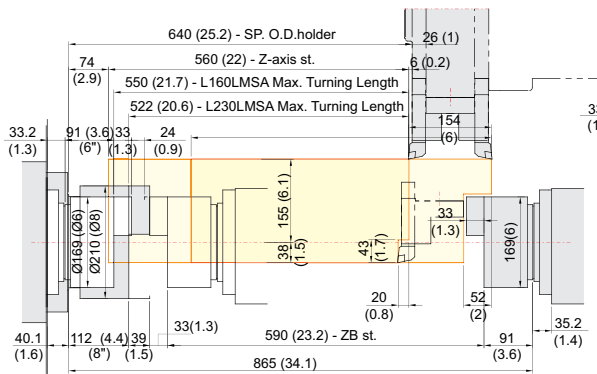
SPECIFICATIONS

Tooling Travel Range

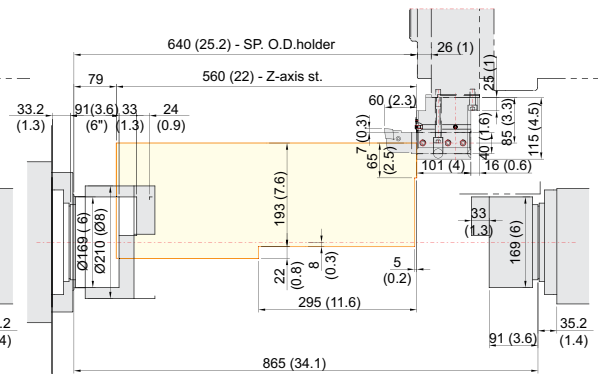
unit : mm(in)

L160LMSA/230LMSA

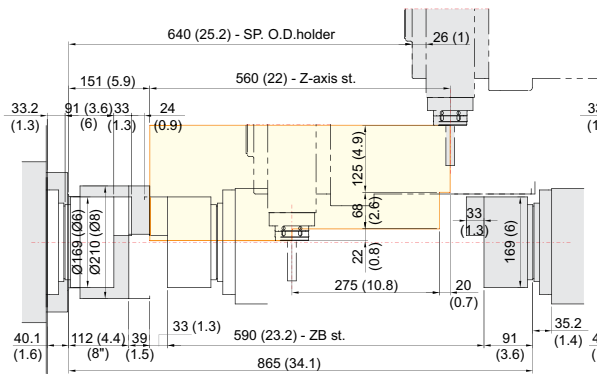
OD tool



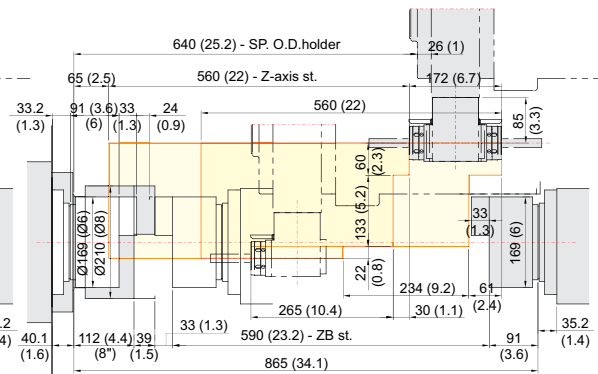
ID tool



Straight Mill Holder



Angular Mill Holder



SPECIFICATIONS

Specifications

[] : Option

ITEM			L160A	L160MA	L160LA	L160LMA	L160LMSA
CAPACITY	Swing Over the Bed	mm(in)	Ø600 (23.6")				
	Swing Over the Carriage	mm(in)	Ø355 (14")				
	Max. Turning Dia.	mm(in)	Ø355 (14")	Ø310 (12.2")	Ø355 (14")	Ø310 (12.2")	
	Max. Turning Length	mm(in)	460 (18.1")	388 (15.3")	560 (22")	550 (21.7")	
	Bar Capacity	Main	mm(in)	Ø45 (1.8")			
Sub		mm(in)	-				Ø43 (1.7")
SPINDLE	Chuck Size	Main	inch		6"		
		Sub	inch		-		6"
	Spindle Bore	Main	mm(in)		Ø53 (2.1")		
		Sub	mm(in)		-		Ø53 (2.1")
	Spindle Speed (rpm)	Main	r/min		6,000 [6,000]		
		Sub	r/min		-		5,000 [5,000]
	Motor (Max/Cont.)	Main	kW(HP)		11/7.5(14.7/10) [10.8/9(14.5/12)]		
		Sub	kW(HP)		-		5.5/3.7(7.4/5) [5.9/4.9 (7.9/6.6)]
	Torque (Max/Cont.)	Main	N·m(lbf·ft)		70/47.7(51.6/35.2) [69/57.3(50.9/42.3)]		
		Sub	N·m(lbf·ft)		-		47.2/31.8 (34.8/23.5) [38/31.6 (28/23.3)]
	Spindle Type	Main	-		BELT		
		Sub	-		-		BELT
	Spindle Nose	Main	-		A2-5		
Sub		-		-		A2-5	
C-axis Indexing	deg	-	0.001°	-	0.001°		
FEED	Travel (X/Z/ZB)	mm(in)	220/460 (8.7"/18.1")	220/400 (8.7"/15.7")	220/560 (8.7"/22")		220/560/590 (8.7"/22"/23.2")
	Rapid Traverse Rate (X/Z/ZB)	m/min(ipm)	36/36 (1,417/1,417)				36/36/30 (1,417/1,417/1,181)
	Slide Type	-	X-Axis : BALL TYPE LM GUIDE, Z-Axis : ROLLER TYPE LM GUIDE				
TURRET	Po. of Tools	EA	12	12 [24]	12	12 [24]	
	Tool Size	OD	mm(in)		□25 (1")		
		ID	mm(in)		Ø40 (1.6")		
	Indexing Time	sec/step	0.2				
LIVE TOOL	Motor (Max/Cont.)	kW(HP)	-	3.7/2.2 (5/3)	-	3.7/2.2 (5/3)	
	Milling Tool Speed (rpm)	r/min	-	5,000	-	5,000	
	Torque (Max/Cont.)	N·m(lbf·ft)	-	23.5/14.2 (17.3/10.5)	-	23.5/14.2 (17.3/10.5)	
	Collet Size	mm(in)	-	Ø16 (0.6") ER25	-	Ø16 (0.6") ER25	
	Type	-	-	BMT55P	-	BMT55P	
TAIL STOCK	Taper	-	MT4				-
	Quill Dia.	mm(in)	Ø56 (2.2")				-
	Quill Travel	mm(in)	-				
	Travel	mm(in)	400 (15.7")		600 (23.6")		-
TANK CAPACITY	Coolant Tank *1)	ℓ (gal)	150 (39.6) {20 Bar : 200 (52.8)}		270 (71.3)		
	Lubricating Tank	ℓ (gal)	1.8 (0.5)				
POWER SUPPLY	Electric Power Supply	kVA	19	22	19	22	24
	Thickness of Power Cable	Sq	Over 16	Over 25	Over 16	Over 25	
	Voltage	V/Hz	220/60 (200/50**2)				
MACHINE	Floor Space (L×W)	mm(in)	2,720×1,685 (107.1"×66.3")		3,392×1,685 (133.5"×66.3")		
	Height	mm(in)	1,862 (73.3")				
	Weight	kg(lb)	4,300 (9,480)		4,500 (9,921)		4,700 (10,362)
PC	Controller	-	HYUNDAI WIA FANUC i Series [SIEMENS 828D]				

*1) Please refer option table if you choose rear direction chip conveyor.

*2) 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.

SPECIFICATIONS

Specifications

[] : Option

ITEM			L230A	L230MA	L230LA	L230LMA	L230LMSA	
CAPACITY	Swing Over the Bed	mm(in)	Ø600 (23.6")					
	Swing Over the Carriage	mm(in)	Ø355 (14")					
	Max. Turning Dia.	mm(in)	Ø355 (14")	Ø310 (12.2")	Ø355 (14")	Ø310 (12.2")		
	Max. Turning Length	mm(in)	440 (17.3")	360 (14.2")	560 (22")	521 (20.5")		
	Bar Capacity	Main	mm(in)	Ø65 (2.6")				
Sub		mm(in)	-				Ø43 (1.7")	
SPINDLE	Chuck Size	Main	8"					
		Sub	-				6"	
	Spindle Bore	Main	Ø78 (3.1")					
		Sub	-				Ø53 (2.1")	
	Spindle Speed (rpm)	Main	4,000 [4,000]					
		Sub	-				5,000 [5,000]	
	Motor (Max/Cont.)	Main	15/11 (20.1/14.7) [22/18.5 (29.5/24.8)]					
		Sub	-				5.5/3.7 (7.4/5) [5.9/4.9 (7.9/6.6)]	
	Torque (Max/Cont.)	Main	286.4/210 (211.2/154.8) [252/211.9 (185.8/156.2)]					
		Sub	-				47.2/31.8 (34.8/23.5) [38/31.6 (28/23.3)]	
	Spindle Type	Main	BELT					
		Sub	-				BELT	
	Spindle Nose	Main	A2-6					
Sub		-				A2-5		
C-axis Indexing	deg	-	0.001°	-	0.001°			
FEED	Travel (X/Z/ZB)	mm(in)	220/440 (8.7"/17.3")	220/400 (8.7"/15.7")	220/560 (8.7"/22")		220/560/590 (8.7"/22"/23.2")	
	Rapid Traverse Rate (X/Z/ZB)	m/min(ipm)	36/36 (1,417/1,417)					36/36/30 (1,417/1,417/1,181)
	Slide Type	-	X-Axis : BALL TYPE LM GUIDE, Z-Axis : ROLLER TYPE LM GUIDE					
TURRET	No. of Tools	EA	12	12 [24]	12	12 [24]		
	Tool Size	OD	□ 25 (1")					
		ID	Ø40 (1.6")					
	Indexing Time	sec/step	0.2					
LIVE TOOL	Motor (Max/Cont.)	kW(HP)	-	3.7/2.2 (5/3)	-	3.7/2.2 (5/3)		
	Milling Tool Speed (rpm)	r/min	-	5,000	-	5,000		
	Torque (Max/Cont.)	N·m(lbf·ft)	-	23.5/14.2 (17.3/10.5)	-	23.5/14.2 (17.3/10.5)		
	Collet Size	mm(in)	-	Ø16 (0.6") ER25	-	Ø16 (0.6") ER25		
	Type	-	-	BMT55P	-	BMT55P		
TAIL STOCK	Taper	-	MT4				-	
	Quill Dia.	mm(in)	Ø56 (2.2")					
	Quill Travel	mm(in)	-					
	Travel	mm(in)	400 (15.7")		600 (23.6")		-	
TANK CAPACITY	Coolant Tank*1)	ℓ (gal)	150 (39.6) {20 Bar : 200 (52.8)}			270 (71.3)		
	Lubricating Tank	ℓ (gal)	1.8 (0.5)					
POWER SUPPLY	Electric Power Supply	kVA	22	25	22	25	27	
	Thickness of Power Cable	Sq	Over 16	Over 25	Over 16	Over 25		
	Voltage	V/Hz	220/60 (200/50*2)					
MACHINE	Floor Space (L×W)	mm(in)	2,760×1,685 (108.7"×66.3")			3,392×1,685 (133.5"×66.3")		
	Height	mm(in)	1,862 (73.3")					
	Weight	kg(lb)	4,400 (9,700)		4,600 (10,141)		4,800 (10,582)	
PC	Controller	-	HYUNDAI WIA FANUC i Series [SIEMENS 828D]					

*1) Please refer option table if you choose rear direction chip conveyor.

*2) 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.

SPECIFICATIONS

Specifications

[] : Option

ITEM			L230C	L230MC	
CAPACITY	Swing Over the Bed		Ø600 (23.6")		
	Swing Over the Carriage		Ø355 (14")		
	Max. Turning Dia.		Ø355 (14")	Ø310 (12.2")	
	Max. Turning Length		422 (16.6")	342 (13.5")	
	Bar Capacity	Main	mm(in)	Ø80 (3.1")	
Sub		mm(in)	-		
SPINDLE	Chuck Size	Main	mm(in)	10"	
		Sub	mm(in)	-	
	Spindle Bore	Main	mm(in)	Ø95 (3.7")	
		Sub	mm(in)	-	
	Spindle Speed (rpm)	Main	r/min	3,000	
		Sub	r/min	-	
	Motor (Max/Cont.)	Main	kW(HP)	18.5/15 (24.8/20.1)	
		Sub	kW(HP)	-	
	Torque (Max/Cont.)	Main	N·m(lbf·ft)	460.7/373.5 (339.8/275.5)	
		Sub	N·m(lbf·ft)	-	
	Spindle Type	Main	-	BELT	
		Sub	-	-	
	Spindle Nose	Main	-	A2-8	
Sub		-	-		
C-axis Indexing		deg	-	0.001°	
FEED	Travel (X/Z/ZB)		220/440 (8.7"/17.3")	220/400 (8.7"/15.7")	
	Rapid Traverse Rate (X/Z/ZB)		36/36 (1,417/1,417)		
	Slide Type		X-Axis : BALL TYPE LM GUIDE, Z-Axis : ROLLER TYPE LM GUIDE		
TURRET	No. of Tools		EA 12		
	Tool Size	OD	mm(in)	□ 25 (1")	
		ID	mm(in)	Ø40 (1.6")	
	Indexing Time		sec/step	0.2	
LIVE TOOL	Motor (Max/Cont.)		kW(HP)	- / 3.7/2.2 (5/3)	
	Milling Tool Speed (rpm)		r/min	- / 5,000	
	Torque (Max/Cont.)		N·m(lbf·ft)	- / 23.5/14.2 (17.3/10.5)	
	Collet Size		mm(in)	Ø16 (0.6") ER25	
	Type		-	-	BMT55P
TAIL STOCK	Taper		-		
	Quill Dia.		mm(in)	MT4 Ø56 (2.2")	
	Quill Travel		mm(in)	-	
	Travel		mm(in)	400 (15.7")	
TANK CAPACITY	Coolant Tank*1		ℓ (gal) 150 (39.6) {20 Bar : 200 (52.8)}		
	Lubricating Tank		ℓ (gal) 1.8 (0.5)		
POWER SUPPLY	Electric Power Supply		kVA 24	27	
	Thickness of Power Cable		Sq Over 16	Over 25	
	Voltage		V/Hz 220/60 (200/50*2)		
MACHINE	Floor Space (L×W)		mm(in) 2,900×1,685 (114.2"×66.3")		
	Height		mm(in) 1,862 (73.3")		
	Weight		kg(lb) 4,500 (9,921)		
PC	Controller		-		
			HYUNDAI WIA FANUC i Series		

*1) Please refer option table if you choose rear direction chip conveyor.

*2) 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

HYUNDAI WIA FANUC i Series

[] : Option

Controlled axis / Display / Accuracy Compensation	
Control axes	2 axes (X, Z) / 3 axes (X, Z, C / X, Z, B) / 4 axes (X, Z, Y, C) 5 axes (X, Z, B, C, A) / 6 axes (X, Z, Y, B, C, A)
Simultaneously controlled axes	2 axes [Max. 4 axes]
Designation of spindle axes	3 axes (1 path)
Least setting Unit	X, Z, Y, B axes : 0.001 mm (0.0001 inch) C, A axes : 0.001 deg
Least input increment	X, Z, Y, B axes : 0.001 mm (0.0001 inch) C, A axes : 0.001 deg
Inch / Metric conversion	G20 / G21
High response vector control	
Interlock	All axes / Each axis
Machine lock	All axes
Backlash compensation	± 0 ~ 9999 pulses (Rapid traverse / Cutting feed)
Position switch	
LCD / MDI	10.4 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
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 Ref. position check : G27
Thread synchronous cutting	
Thread cutting retract	
Variable lead thread cutting	
Multi / Continuous threading	
Feed function / Acc. & Dec. control	
Manual feed	Rapid traverse Jog : 0~2,000 mm/min (79 ipm) Manual handle : x1, x10, x100 pulses 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	1 ea
Absolute / Incremental program	G90 / G91
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
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	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 & 4 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	1280m (512KB)
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	RS 232C serial port, CF card, USB memory 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 axes)	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
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	
Tool offset pairs	200 pairs
Part program storage size	5120m (2MB)
Polygon turning (2 Spindles)	Mill, MS, Y, SY, LF-Mill, TTMS, TTSY
Helical interpolation	
Manual Guide i	Conversational auto program
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.

CONTROLLER

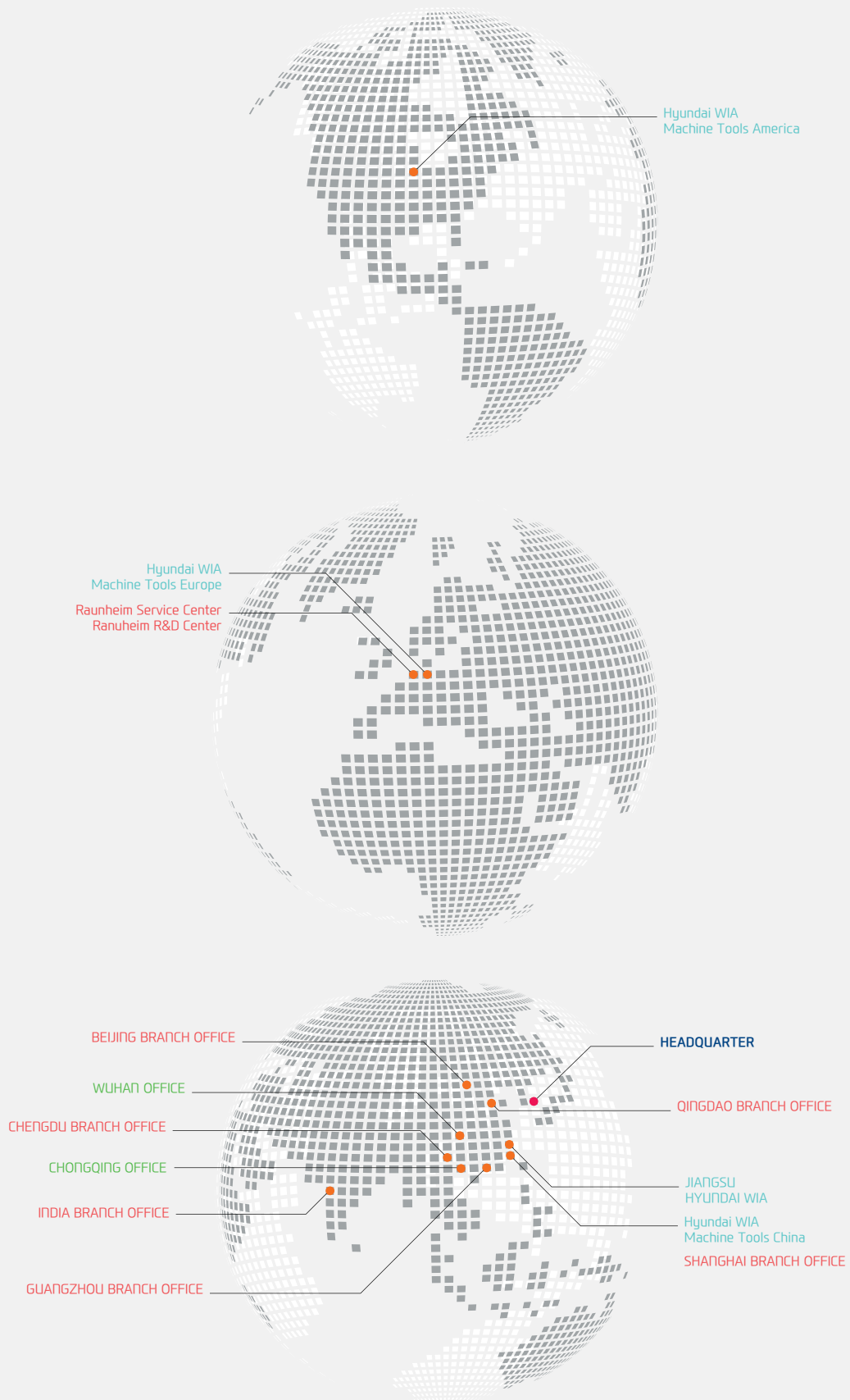
SIEMENS 828D (L160A Series | L230A Series)

Control function	
Max. configuration of axis	3 axis(MS / SY exception) 4 axis(MS / SY machine only)
Max. configuration of axis and sp.	6 axis(MS / SY exception) 8 axis(MS / SY machine only)
Least Command/input	0.0001mm / 0.00001inch
Feed function	
Feedrate Override	0 - 120%
Rapid Traverse Override	F1, 5, 25/50, 100%
Acceleration with jerk limitation	
Programmable acceleration	
Follow-up mode	
Measuring system 1 and 2, selectable	
Separate path feed for corners and chamfers	
Travel to fixed stop	
Spindle function	
Spindle Override	50% - 120%
Spindle Orientation	
Spindle Speed Limitation	
Rigid Tapping	
Interpolation function	
Linear interpolation axis	Max. 4 axis
Circle via center point and end point	
Circle via interpolation point	
Helical interpolation	
Universal interpolator NURBS (non-uniform rational B splines)	
Continuous-path mode with programmable rounding clearance	
Tool function	
Tool Radius Comp.	
Zero Offset (G54, G55, G56, G57, G58, G59)	100 EA
Programmable Zero Offset	
Tool management	
Display	
CRT / MDI	10.4" Color LCD
SCREEN SAVER	
Manual Operation	
Manual Handle/Jog Feed	
Reposition	
Reference Approach	Ref 1, 2 Approach
Spindle Control	Start, Stop, Rev, Jog, Ort.
Auto Operation	
Single Block	
Feed Hold	
Optional Block Skip	
Machine Lock	
Dry Run	
Simulation	(2 dimensional)
Diagnosis function	
Alarm Display	
Spindle Load Meter/RPM Meter (monitor)	
PLC status/LAD display	
Program function	
Part Program Storage Length	3MB (MS / SY exception) PPU26x.x 5MB (MS / SY machine only) PPU28x.x
Program Name	23 digit
Subroutine Call	(7 level)
Absolute/incremental Command	G90 - G91
Scaling, ROT	
Inch / Metric Conversion	
Conversational Cycle Program	(22 Machine)
Block Search	
Variable Program (Macro)	
Read / Write System Variable	
BackGround Editing	
Miscellaneous Functions	M - Code
Label Skip	
Program Stop/End	M00, M01, M02, M30
Lookahead, Jerk LimitationFeed & forward control	
ISO Dialect Interpreter(G291) (Fanuc Program exe)	
Maximum number of tools/cuttings	128/256 (MS / SY exception) PPU26x.x 256/512 (MS / SY machine only) PPU28x.x
Number of levels for skip blocks 1	
Protection Function	
Emergency Stop	
Over Travel	Soft Limit & Hard O.T
Contour Monitoring	
Program Protection	
Automation Support Fun.	
Actual Speed Display(Monitor)	
Tool Life Management	(Time, Parts)
Work Count Function	(Internal)
Language Function	
Two Language Switchable	(6EA) Chinese Traditional, Czech, Danish, Dutch, Finnish, Hungarian, Japanese, Korean, Polish, Russian, Swedish, Portuguese, Turkish
Data Transfer	
RS 232C I/F / Ethernet	
USB Memory Stick & CF Card	
Option	
Shop Turn	
3D Simulation	
DRF offset	
Teach -in	
Number of levels for skip blocks 8	
TRACYL (Cylinder interpolation)	
TRANSMIT (Pole coordinate command)	
Sister Tool	
A,B,C SPLINE INTERPOLATION	
RCS HOST (Remote Control)	
Simultaneous Recording (Real time monitoring)	
Analysis of Internal Drive Values	
Network Drive Management	

Figures in inch are converted from metric values.

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

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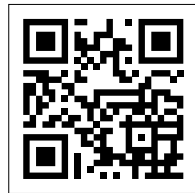
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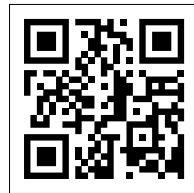
L160MA Movie



L160LMSA Movie



L230A Movie



L230LMSA Movie



L230LMSA 3D Movie



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