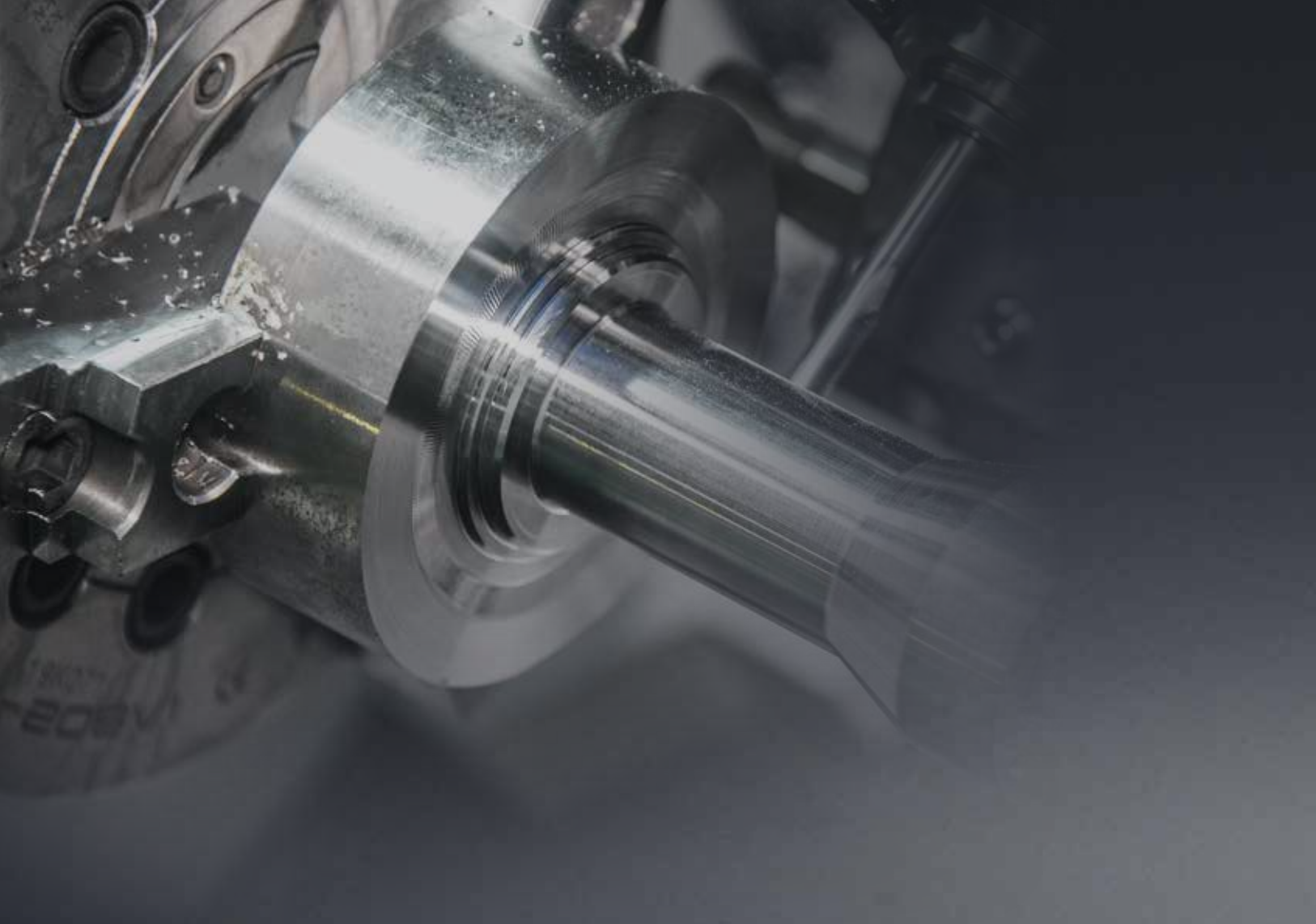


160/230 Series

L160A/LA/MA/LMA/LMSA | L230LA/MA/LMA/LMSA | L230C/MC

HYUNDAI WIA Versatile 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	Standard	BMT55
L160A	•				•		•	
L160LA	•					•	•	
L160MA	•				•			•
L160LMA	•					•		•
L160LMSA	•			•		•		•
L230LA		•				•	•	
L230MA		•			•			•
L230LMA		•				•		•
L230LMSA		•		•		•		•
L230C			•		•		•	
L230MC			•		•			•

160/230 Series

Versatile, High Production CNC Turning Center

- 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 BASIC STRUCTURE

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

Mill Turret (*M* Type)

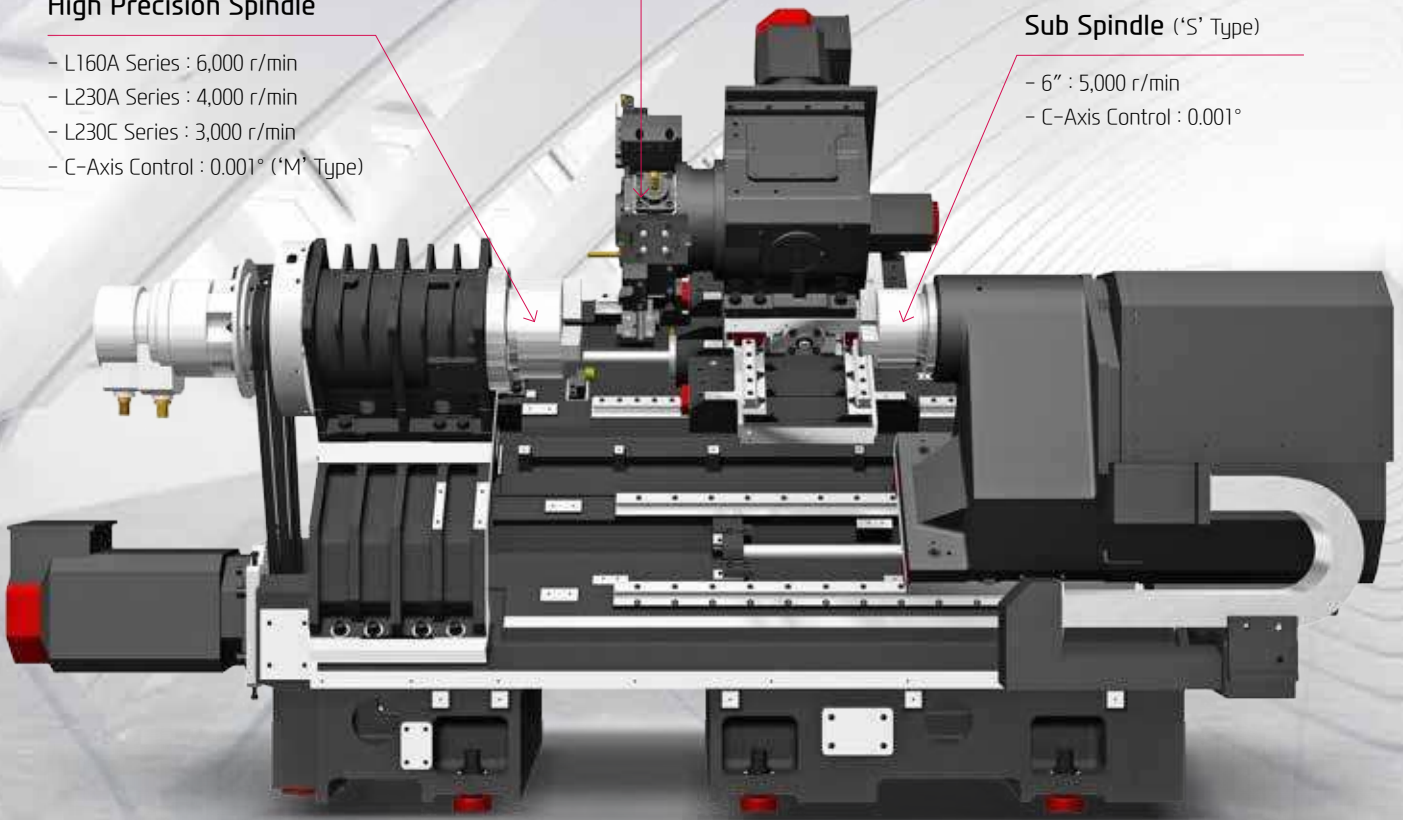
- BMT55 (12 [24] EA)
- 5,000 r/min
- Collet Size : $\varnothing 16$ ($\varnothing 5/8$ ") {ER25}

High Precision Spindle

- L160A Series : 6,000 r/min
- L230A Series : 4,000 r/min
- L230C Series : 3,000 r/min
- C-Axis Control : 0.001° (*M* Type)

Sub Spindle (*S* Type)

- 6" : 5,000 r/min
- C-Axis Control : 0.001°



L230LMSA



MT#4 ONE-TOUCH TAIL STOCK

L160/230 Series provides an easy to operation & convenient to use one-touch tail stock as standard. Tail stock travel : 400mm (15.7") / L type : 600mm (23.6")
(MT#5 Quill Type Tail Stock : Option)

REDUCTION OF NON-CUTTING TIME BY FAST RAPID SPEED

ALL-IN-ONE TYPE OF BED

High Precision & Rigidity, One-Piece Structure

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.



RIGIDITY OF THE BED ENHANCED BY 24% THROUGH STRUCTURAL ANALYSIS

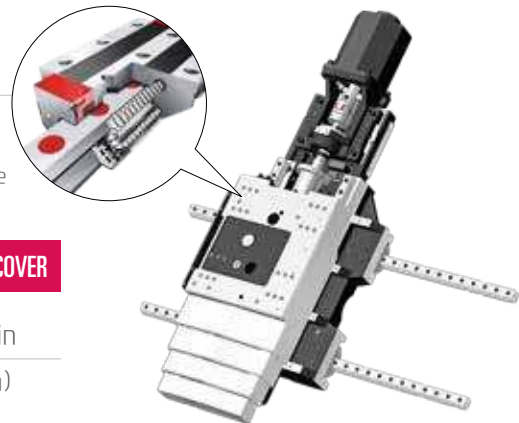
Integrated Coolant Tank

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.

GUIDEWAY

High-Speed Roller LM Guideway

Linear roller guideways are applied to reduce non-cutting time and bring high rigidity.



DURABILITY IMPROVED BY APPLICATION OF MULTISTAGE SLIDE COVER

Rapid Traverse Rate (X/Z) **36/36** m/min
(1,181/1,417 ipm)

Enlarging distance between each rail span

Previous Model X-Axis 200 mm

L160/230 X-Axis 250 mm **26% ↑**

Previous Model Z-Axis 300 mm

L160/230 Z-Axis 350 mm **22% ↑**

Travel (X/Z)

L160A

220/460 mm (8.7"/18.1")

L160MA | L230MA/MC

220/400 mm (8.7"/15.7")

L230C

220/440 mm (8.7"/15.7")

L160LA/LMA/LMSA | L230LA/LMA/LMS

220/560 mm (8.7"/22")

02 HIGH PRECISION SPINDLE

Long Lasting, High Accuracy & Excellent Performance CNC Turning Center

Spindle Specifications

[] : Option

MODEL	Spindle Speed	Motor (Max./Cont.)	Torque (Max./Cont.)	Driving Method
L160A Series	6,000 rpm (FAPIUC)	11/7.5 kW (15/10HP)	70/47.7 N·m (51.6/35.2 lbf·ft)	Belt
	[6,000 rpm (iTROL)]	1[0.8/9 kW (14.5/12HP)]	[69/57.3 N·m (50.9/42.3 lbf·ft)]	
L230A Series	4,000 rpm (FAPIUC)	15/11 kW (20/15HP)	286.4/210 N·m (211.2/154.9 lbf·ft)	
	[4,000 rpm (iTROL)]	[22/18.5 kW (30/25HP)]	[252/211.9 N·m (185.9/156.3 lbf·ft)]	
L230C Series	3,500 rpm (FAPIUC)	18.5/15 kW (25/20HP)	460.7/373.5 N·m (339.8/275.5 lbf·ft)	
Sub Spindle	5,000 rpm (FAPIUC)	5.5/3.7 kW (7.4/5HP)	47.2/31.8 N·m (34.8/23.5 lbf·ft)	
	[5,000 rpm (iTROL)]	[5.9/4.9 kW (7.9/6.6HP)]	[38/31.6 N·m (28/23.3 lbf·ft)]	

HEAVY DUTY CUTTING & HIGH ACCURACY

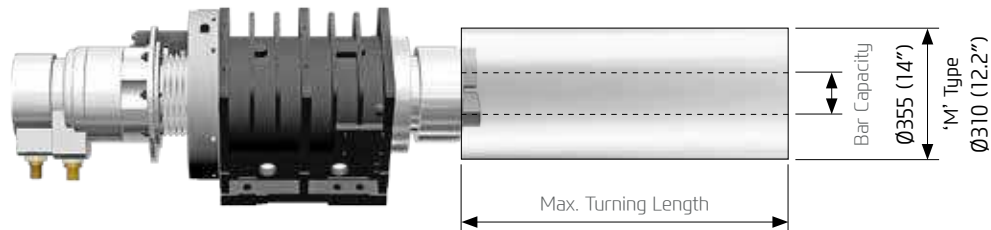
MAIN SPINDLE

Spindle for Specialized in High-speed and Rough Cutting

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 ('M' Type)

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



unit : mm(in)

Max. Turning Length	Standard Bed		Long Type Bed		Bar Capacity
	Servo Turret	Mill Turret	Servo Turret	Mill Turret	
L160A Series	460 (18.1")	388 (15.3")	560 (22")	550 (21.7")	Ø45 (1.8")
L230A Series	-	360 (14.2")	560 (22")	521 (20.5")	Ø65 (2.6")
L230C Series	422 (16.6")	342 (13.5")	-	-	Ø81 (Ø3.1")

6" SUB SPINDLE ('S' Type)

The Belt-type sub spindle is designed to minimize thermal displacement during the continuous machining, offering from the heavy-duty cutting to the high-speed machining. 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.



03 SERVO TURRET

High speed, High Accuracy, Highly Reliable Servo Turret

Servo Turret

No. of Tools

12_{EA}

Tool Size (O.D./I.D)

□ 25/Ø40 mm (□ 1"/Ø1 1/2")

Indexing Time

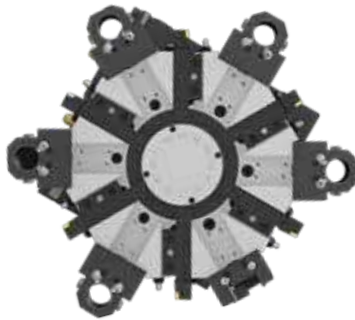
0.12_{sec}

Mill Turret

ITEM	Speed	Motor (Max./Cont)	Torque (Max./Cont)	Collet Size
BMT55	5,000 rpm	FANUC : 3.7/2.2 kW (5/3 HP) iTROL : 3.4/2.8 kW (4.6/3.6 HP)	FANUC : 23.5/14.2 N·m (17.3/10.5 lbf·ft) iTROL : 21.6/17.6 N·m (15.9/13 lbf·ft)	Ø16 (0.6") ER25

VARIOUS DRIVEN PRECISION BMT TOOL HOLDERS

SERVO TURRET



Servo Turret

The turret of L160/230 series are applied with high performance AC servo motor, improving machining reliability. 3-piece coupling shows excellent performance in indexing. Powerful hydraulic tool clamping minimizes tool tip deviation caused by load.

20 Bar(290 psi) High Pressure Coolant **OPTION**

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



MILL TURRET

BMT55 Turret

The BMT turret secures the tool with four bolts and key on the tool mounting surface of the turret, making it possible to powerfully fix the tool, ensuring high reliability in rigidity and precision.



STRAIGHT MILLING HEAD



ANGULAR MILLING HEAD



Mill Tool Holder

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



Special Tool

OPTION

The L160/230 series can process high value-added products using a variety of rotating tools. In particular, there is a multi-holder for attaching a variety of tools to one holder, and an eccentric rotary tool for handling eccentric parts without additional axis travel, which can realize integration of process with one machine.

❖ Consultation needed when ordering these options.

04 USER CONVENIENCE

Various Devices for User Friendly

BAR FEEDER SYSTEM

Bar Feeder

Bar feeder system enables automation which leads to efficiency improvement.

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



Parts Catcher

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



Auto Door

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



Parts Conveyor

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



Auto Shutter

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

HIGH PRECISION SYSTEM



Automatic Q-Setter

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



Linear Scale

Linear scales increase positioning accuracy and reduce distortion caused by thermal growth, thus ensuring a more accurate finished part



Work Probe

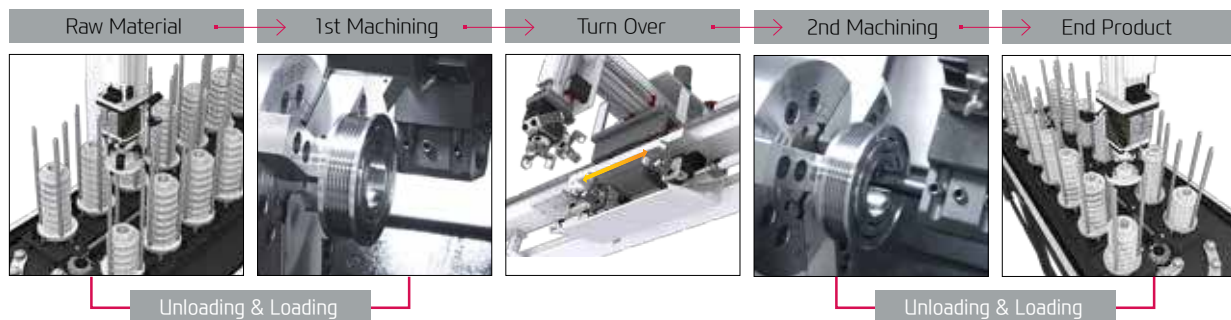
Workpiece coordinate values can be set automatically using the optional spindle probe.

Optional

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.



COOLANT UNIT & ECO SYSTEM



Standard Coolant (Nozzle)

Chuck Coolant (Upper Chuck)

Chuck Air Blow (Upper Chuck)

Air Gun



MQL : Minimal Quantity Lubrication

Oil Skimmer

Mist Collector

Grease Lubrication Device

SPECIFICATIONS

L160 Series Standard & Optional

Spindle		A	MA	LA	LMA	LMSA
Main Sp. Hollow Chuck 3 Jaw	6"	●	●	●	●	●
Main Sp. Solid Chuck 3 Jaw	6"	○	○	○	○	○
Sub Sp. Hollow Chuck 3 Jaw	6"	-	-	-	-	●
Sub Sp. 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		●	●	●	●	●
2 Steps Chuck Foot Switch		☆	☆	☆	☆	☆
Sub Spindle Foot Switch		-	-	-	-	○
Turret						
Tool Holder		●	●	●	●	●
Mill Turret	Axial	-	●	-	●	●
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		●	●	●	●	●
Swivel Head		-	☆	-	☆	☆
Tail Stock & Steady Rest						
Semi Programmable Tail Stock		●	●	●	●	-
Quill 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		○	○	○	○	-
Coolant & Air Blow						
Standard Coolant (Nozzle)		●	●	●	●	●
Chuck Coolant (Upper Chuck)		○	○	○	○	○
Gun Coolant		○	○	○	○	○
Spindle Thru Coolant (Only for Special Chuck)		☆	☆	☆	☆	☆
Bed Flushing		○	○	○	○	○
Chuck Air Blow (Upper Chuck)		○	○	○	○	○
Sub Spindle Air Blow		-	-	-	-	○
Turret Air Blow		☆	☆	☆	☆	☆
Air Gun		○	○	○	○	○
Spindle Thru Air Blow (Only for Special Chuck)		☆	☆	☆	☆	☆
High Pressure Coolant	0.4Bar	●	●	●	●	●
	6Bar	○	○	○	○	○
	20Bar	○	○	○	○	○
Power Coolant System (For Automation)		☆	☆	☆	☆	☆
Chip Disposal						
Coolant Tank	Front(150 ℓ)	●	●	-	-	-
	Front(200 ℓ /20Bar)	○	○	-	-	-
	Front(270 ℓ)	-	-	●	●	●
	Rear(200 ℓ)	○	○	-	-	-
	Rear(250 ℓ)	-	-	○	○	○
Chip Conveyor (Hinge/Scraper)	Front (Right)	○	○	○	○	○
	Rear (Rear)	○	○	○	○	○
Special Chip Conveyor (Drum Filter)		☆	☆	☆	☆	☆
Chip Wagon	Standard(145 ℓ)	○	○	○	○	○
	Large Size (330 ℓ)	○	○	○	○	○
	Swing(150 ℓ)	○	○	○	○	○
	Large Swing (290 ℓ)	○	○	○	○	○
	Customized	☆	☆	☆	☆	☆
Safety Device						
Total Splash Guard		●	●	●	●	●
Chuck Hydraulic Pressure Maintenance Interlock		●	●	●	●	●
ETC						
Tool Box		●	●	●	●	●
Customized Color	Need Munsel No.	☆	☆	☆	☆	☆
CAD & CAM		☆	☆	☆	☆	☆

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

Electric Device		A	MA	LA	LMA	LMSA
Call Light	1Color : ●	●	●	●	●	●
Call Light & Buzzer	3Color : ● ● ● B	○	○	○	○	○
Electric Cabinet Light		○	○	○	○	○
Remote MPG		-	-	-	-	-
Work Counter	Digital	○	○	○	○	○
Total Counter	Digital	○	○	○	○	○
Tool Counter	Digital	○	○	○	○	○
Multi Tool Counter	Digital	○	○	○	○	○
Electric Circuit Breaker		○	○	○	○	○
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	○	○	○	○	○
	HYUNDAI-ITROL	●	●	●	●	●
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 (I/N & O/U)	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	35ba/18 ℓ	●	●	●	●	●
S/W						
Machine Guidance (HW-MCG)		●	●	●	●	●
Energy Saving System (HW-ESS)		●	●	●	●	●
Tool Monitoring (HW-TM)		○	○	○	○	○
Spindle Heat Distortion Compensation(HW-TDC)		○	○	○	○	○
DNC software (HW-eDNC)		○	○	○	○	○
Machine Monitoring System (HW-MMS)		○	○	○	○	○
Conversational Program (HW-DPRO)		○	○	○	○	○

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

SPECIFICATIONS

L230 Series Standard & Optional

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

Spindle		MA	LA	LMA	LMSA
Main Sp. Hollow Chuck 3 Jaw	8"	●	●	●	●
Main Sp. Solid Chuck 3 Jaw	8"	○	○	○	○
Sub Sp. Hollow Chuck 3 Jaw	6"	-	-	-	●
Sub Sp. 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		●	●	●	●
2 Steps Chuck Foot Switch		☆	☆	☆	☆
Sub Spindle Foot Switch		-	-	-	○
Turret					
Tool Holder		●	●	●	●
Mill Turret	Axial	○	-	●	●
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		●	●	●	●
Swivel Head		☆	-	☆	☆
Tail Stock & Steady Rest					
Semi Programmable Tail Stock		●	●	●	-
Quill 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		○	○	○	-
Coolant & Air Blow					
Standard Coolant (Nozzle)		●	●	●	●
Chuck Coolant (Upper Chuck)		○	○	○	○
Gun Coolant		○	○	○	○
Spindle Thru Coolant (Only for Special Chuck)		☆	☆	☆	☆
Bed Flushing		○	○	○	○
Chuck Air Blow (Upper Chuck)		○	○	○	○
Sub Spindle Air Blow		-	-	-	○
Turret Air Blow		☆	☆	☆	☆
Air Gun		○	○	○	○
Spindle Thru Air Blow (Only for Special Chuck)		☆	☆	☆	☆
High Pressure Coolant	0.4Bar	●	●	●	●
	6Bar	○	○	○	○
	20Bar	○	○	○	○
Power Coolant System (For Automation)		☆	☆	☆	☆
Chip Disposal					
Coolant Tank	Front(150ℓ)	●	-	-	-
	Front(200ℓ /20Bar)	○	-	-	-
	Front(270ℓ)	-	●	●	●
	Rear(200ℓ)	○	-	-	-
	Rear(250ℓ)	-	○	○	○
Chip Conveyor (Hinge/Scraper)	Front (Right)	○	○	○	○
	Rear (Rear)	○	○	○	○
Special Chip Conveyor (Drum Filter)		☆	☆	☆	☆
Chip Wagon	Standard(145ℓ)	○	○	○	○
	Large Size (330ℓ)	○	○	○	○
	Swing(150ℓ)	○	○	○	○
	Large Swing (290ℓ)	○	○	○	○
	Customized	☆	☆	☆	☆
Safety Device					
Total Splash Guard		●	●	●	●
Chuck Hydraulic Pressure Maintenance Interlock		●	●	●	●
ETC					
Tool Box		●	●	●	●
Customized Color	Need Munsell No.	☆	☆	☆	☆
CAD & CAM		☆	☆	☆	☆

Electric Device		MA	LA	LMA	LMSA
Call Light	1Color : ●	●	●	●	●
Call Light & Buzzer	3Color : ●●● B	○	○	○	○
Electric Cabinet Light		○	○	○	○
Remote MPG		-	-	-	-
Work Counter	Digital	○	○	○	○
Total Counter	Digital	○	○	○	○
Tool Counter	Digital	○	○	○	○
Multi Tool Counter	Digital	○	○	○	○
Electric Circuit Breaker		○	○	○	○
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	○	○	○	○
	HYUNDAI-TROL	●	●	●	●
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 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	35ba/18ℓ	●	●	●	●
S/W					
Machine Guidance (HW-MCG)		●	●	●	●
Energy Saving System (HW-ESS)		●	●	●	●
Tool Monitoring (HW-TM)		○	○	○	○
Spindle Heat Distortion Compensation(HW-TDC)		○	○	○	○
DNC software (HW-eDNC)		○	○	○	○
Machine Monitoring System (HW-MMS)		○	○	○	○
Conversational Program (HW-DPRO)		○	○	○	○

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

SPECIFICATIONS

Standard & Optional

		C	MC
Spindle			
Main Sp. Hollow Chuck 3 Jaw	10"	●	●
Main Sp. Solid Chuck 3 Jaw	10"	○	○
Sub Sp. Hollow Chuck 3 Jaw	6"	-	-
Sub Sp. 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		●	●
2 Steps Chuck Foot Switch		☆	☆
Sub Spindle Foot Switch		-	-
Turret			
Tool Holder		●	●
Mill Turret	Axial	-	●
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		●	●
Swivel Head		-	☆
Tail Stock & Steady Rest			
Semi Programmable Tail Stock		●	●
Quill Tail Stock (Foot Switch)	MT-5	○	○
Built-In Tail Stock	MT-4	☆	☆
Programmable Tail Stock		-	-
Standard Live Center		●	-
High Precession Live Center		○	-
2 Steps Tail Stock Pressure System		☆	☆
Quill Forward/Reverse Confirmation Device		●	●
Coolant & Air Blow			
Standard Coolant (Nozzle)		●	●
Chuck Coolant (Upper Chuck)		○	○
Gun Coolant		○	○
Spindle Thru Coolant (Only for Special Chuck)		☆	☆
Bed Flushing		○	○
Chuck Air Blow (Upper Chuck)		○	○
Sub Spindle Air Blow		-	-
Turret Air Blow		☆	☆
Air Gun		○	○
Spindle Thru Air Blow (Only for Special Chuck)		☆	☆
High Pressure Coolant	0.4Bar	●	●
	6Bar	○	○
	20Bar	○	○
Power Coolant System (For Automation)		☆	☆
Chip Disposal			
Coolant Tank	Front(150 ℓ)	●	●
	Front(200 ℓ /20Bar)	○	○
	Rear(200 ℓ)	○	○
Chip Conveyor (Hinge/Scraper)	Front (Right)	○	○
	Rear (Rear)	○	○
Special Chip Conveyor (Drum Filter)		☆	☆
Chip Wagon	Standard(145 ℓ)	○	○
	Large Size (330 ℓ)	○	○
	Swing(150 ℓ)	○	○
	Large Swing (290 ℓ)	○	○
	Customized	☆	☆
Safety Device			
Total Splash Guard		●	●
Chuck Hydraulic Pressure Maintenance Interlock		●	●
ETC			
Tool Box		●	●
Customized Color	Need Munsel No.	☆	☆
CAD & CAM		☆	☆

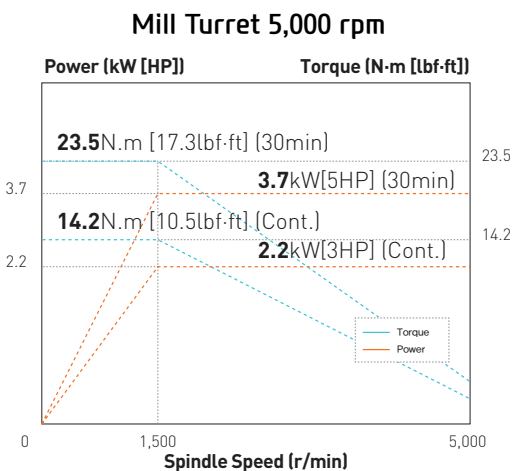
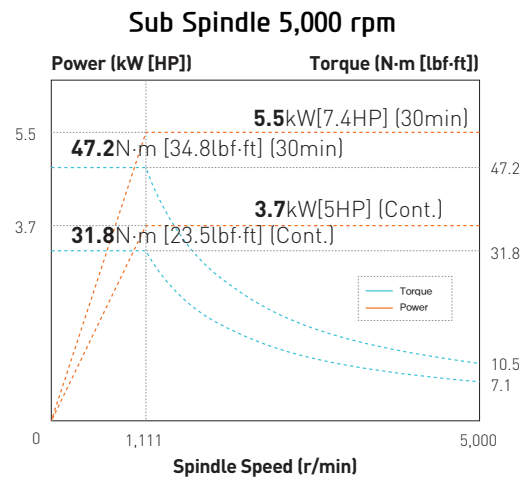
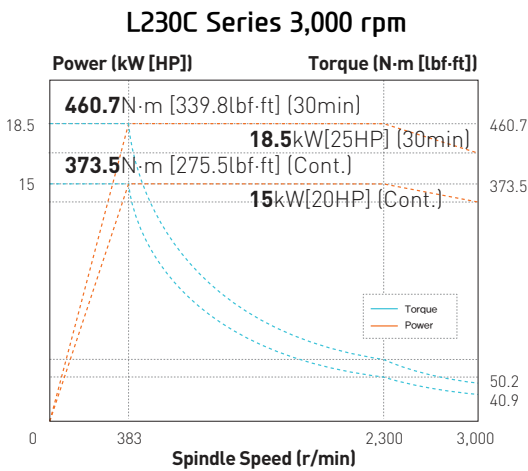
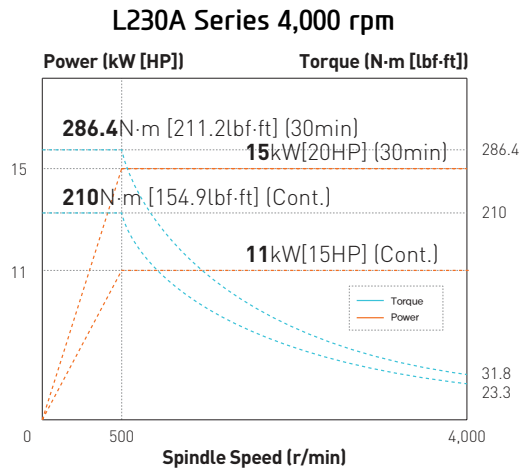
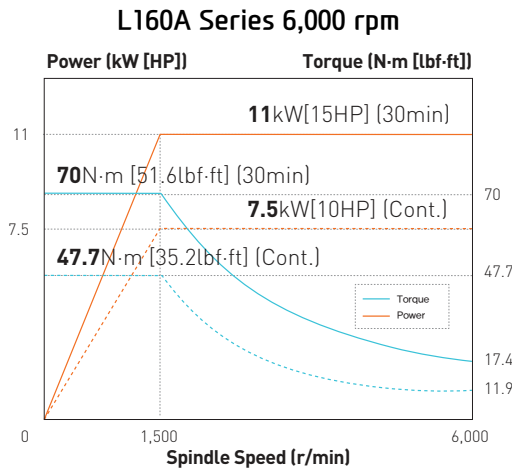
● : Standard ○ : Option ☆ : Prior Consultation - : Non Applicable

		C	MC
Electric Device			
Call Light	1Color : ●	●	●
Call Light & Buzzer	3Color : ● ● ● B	○	○
Electric Cabinet Light		○	○
Remote MPG		-	-
Work Counter	Digital	○	○
Total Counter	Digital	○	○
Tool Counter	Digital	○	○
Multi Tool Counter	Digital	○	○
Electric Circuit Breaker		○	○
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	○	○
	HYUNDAI-TROL	●	●
Oil Mist Collector		☆	☆
Oil-Water Separation Device		●	●
Oil Skimmer		○	○
ML(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	35ba/18 ℓ	●	●
S/W			
Machine Guidance (HW-MCG)		●	●
Energy Saving System (HW-ESS)		●	●
Tool Monitoring (HW-TM)		○	○
Spindle Heat Distortion Compensation(HW-TDC)		○	○
DNC software (HW-eDNC)		○	○
Machine Monitoring System (HW-MMS)		○	○
Conversational Program (HW-DPRO)		○	○

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

SPECIFICATIONS

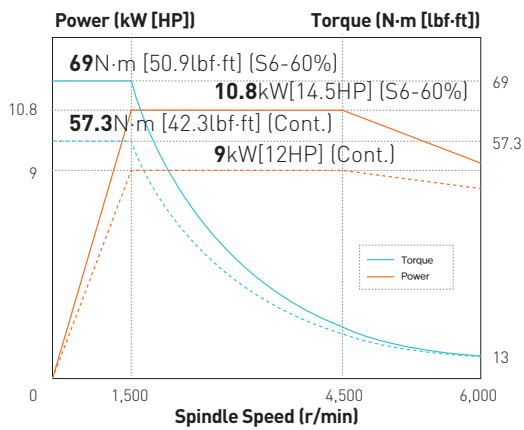
Spindle Output/Torque Diagram (HYUNDAI WIA FANUC i Series)



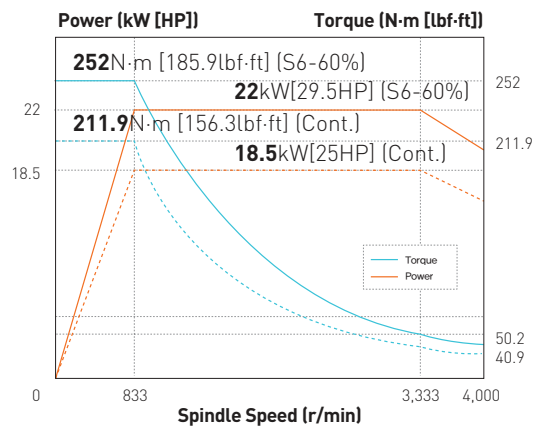
SPECIFICATIONS

Spindle Output/Torque Diagram (HYUNDAI-iTROL)

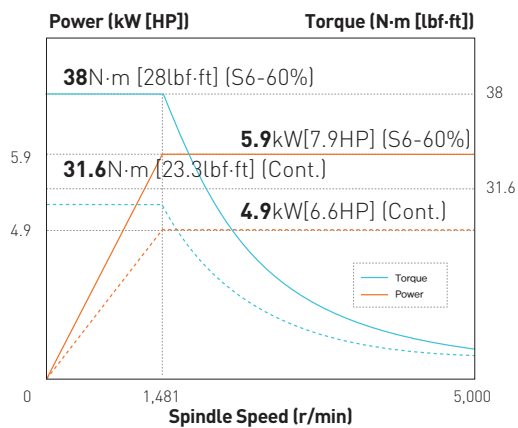
L160A Series 6,000 rpm



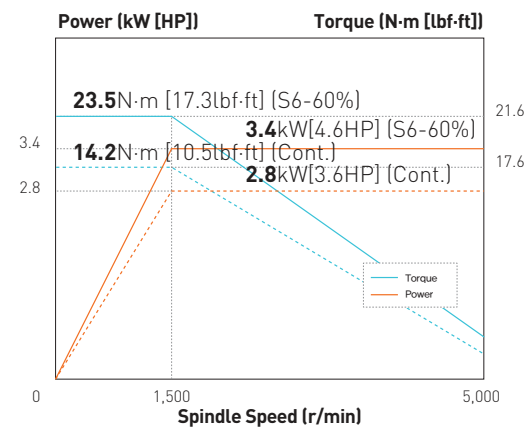
L230A Series 4,000 rpm



Sub Spindle 5,000 rpm



Mill Turret 5,000 rpm

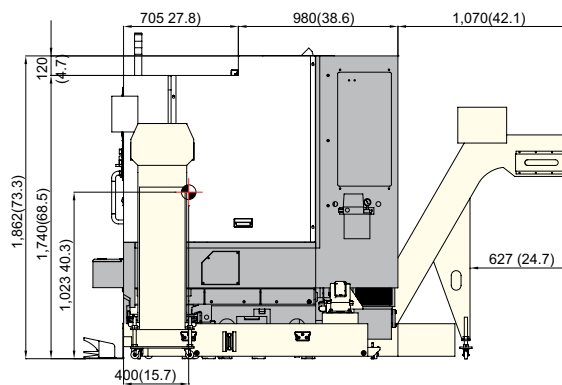
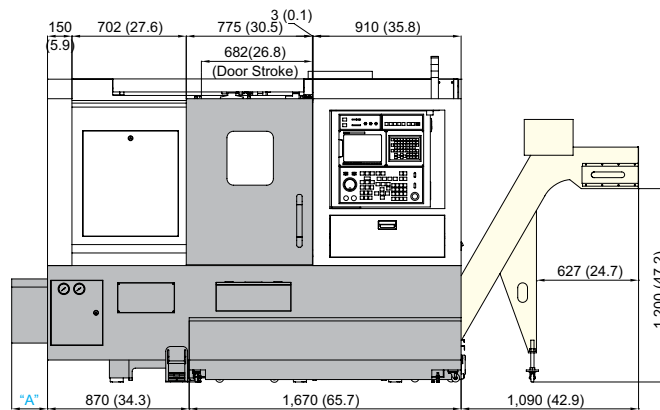
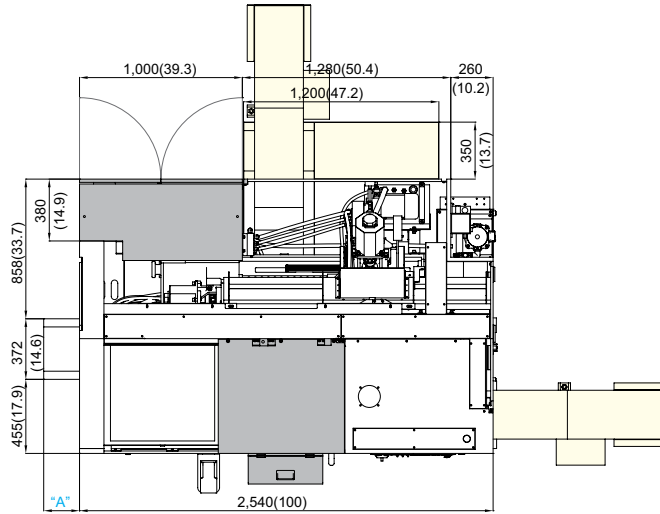


SPECIFICATIONS

External Dimensions

unit : mm(in)

L160A/MA
L230MA
L230C/MC



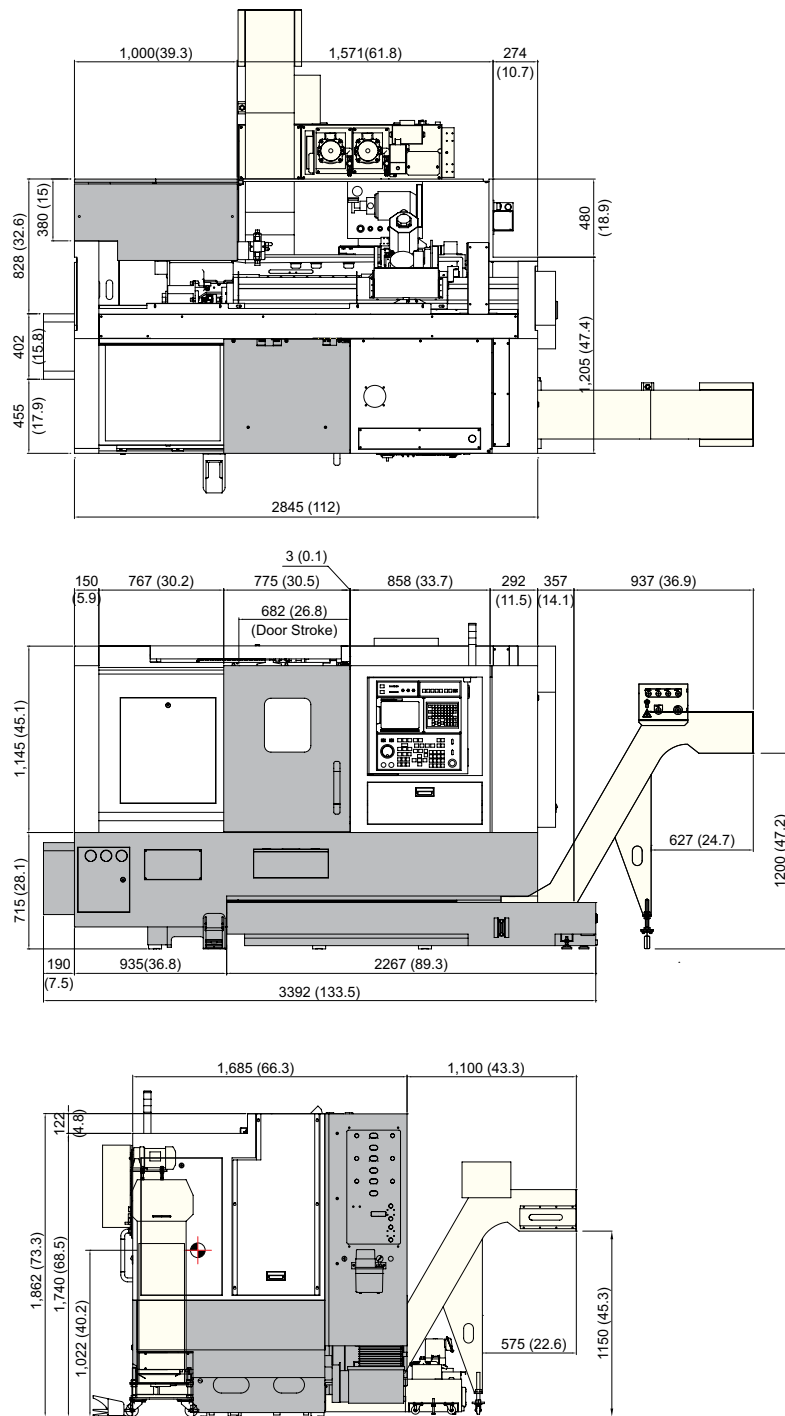
"A" L160A : 190mm(7.5") L230A : 220mm(8.7") L230C : 360mm(14.2")

SPECIFICATIONS

External Dimensions

unit : mm(in)

L160LA/LMA/LMSA
L230LA/LMA/LMSA

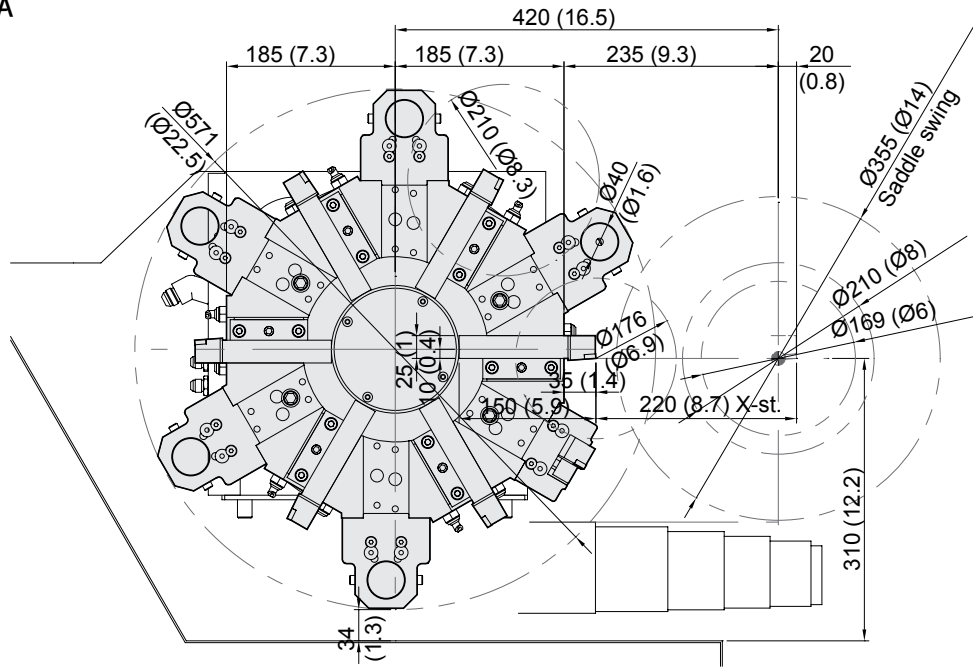


SPECIFICATIONS

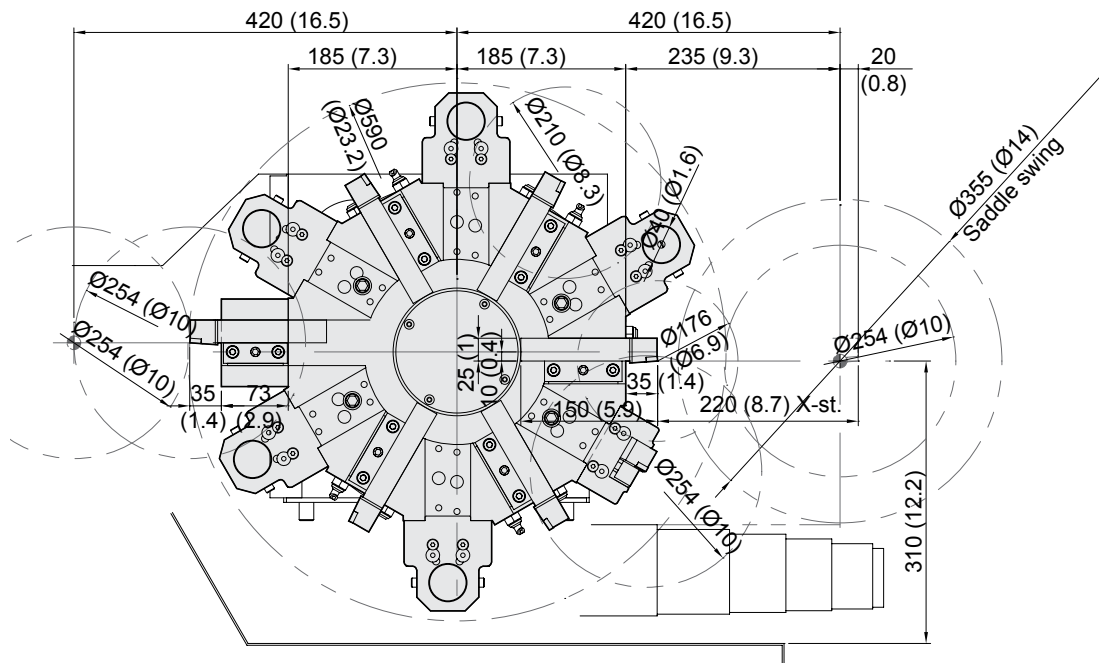
Interference

unit : mm(in)

L160A/LA
L230LA



L230C/LC

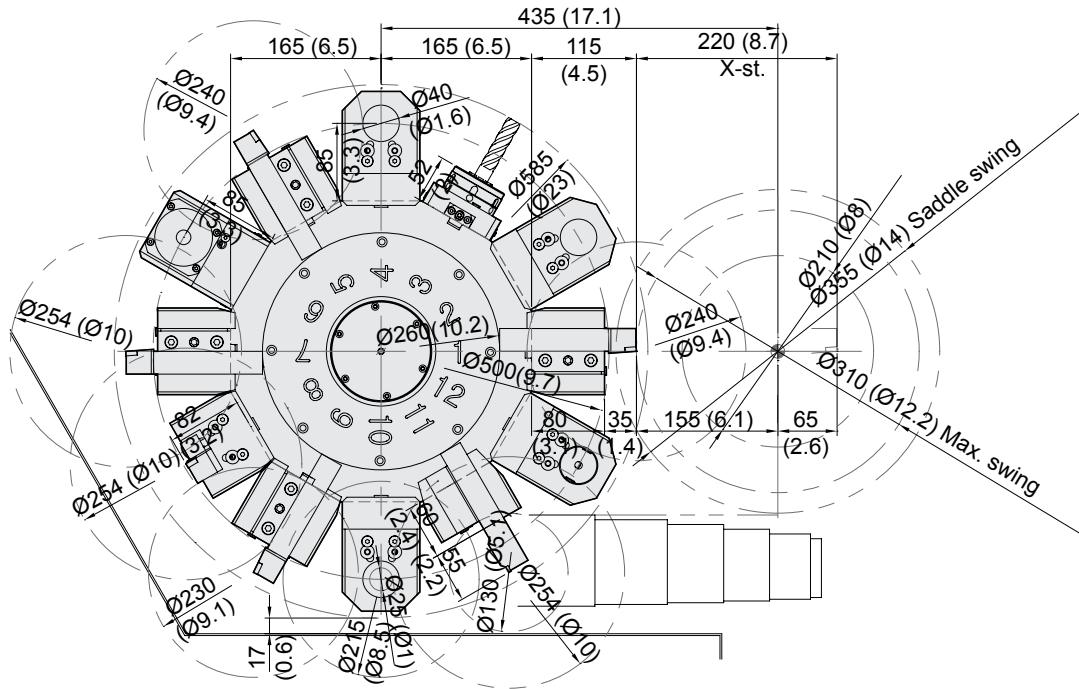


SPECIFICATIONS

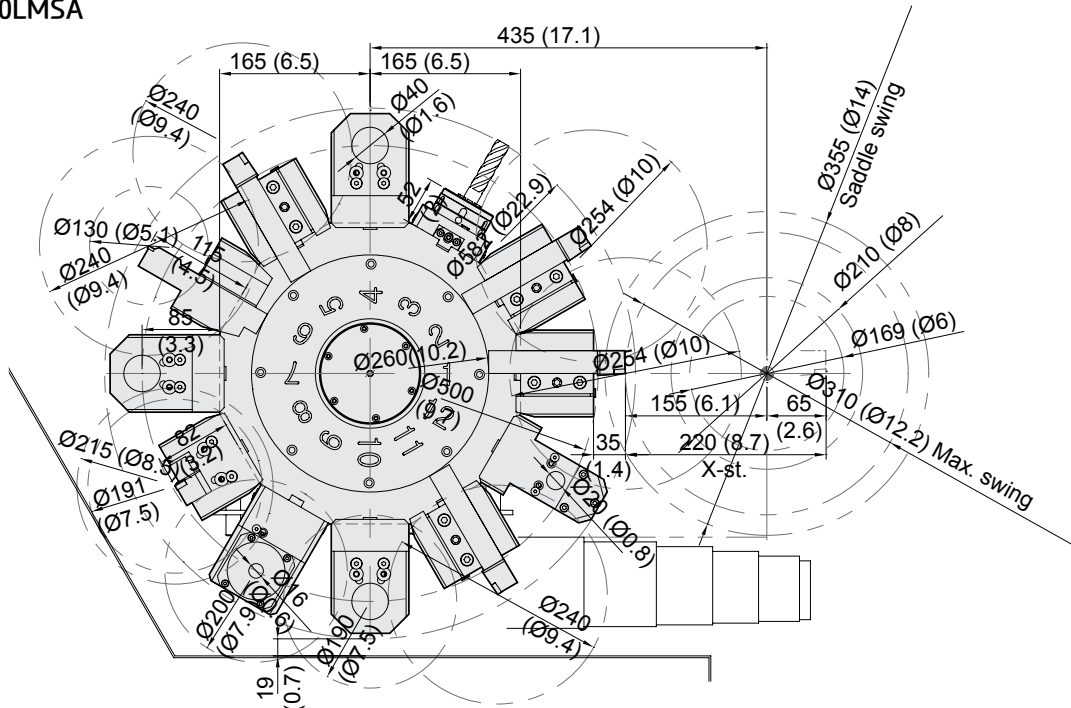
Interference

unit : mm(in)

L160MA/LMA
L230MA/MC/LMA



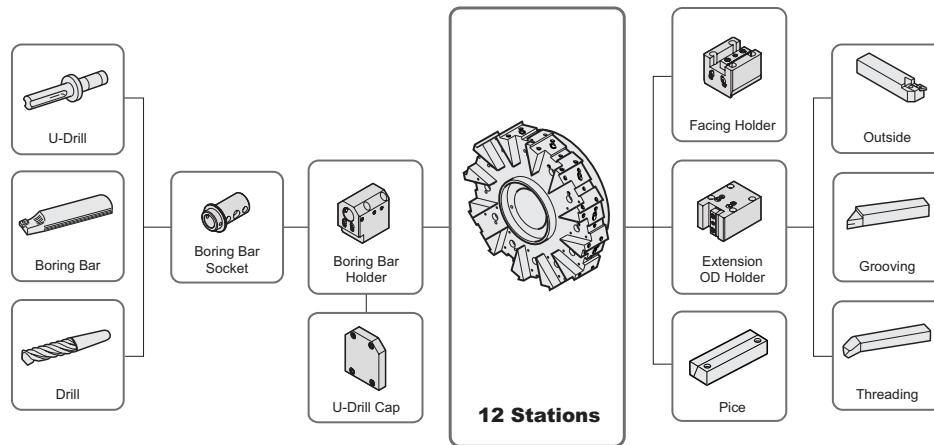
L160LMSA
L230LMSA



SPECIFICATIONS

Tooling System

unit : mm(in)



Tooling Parts Detail

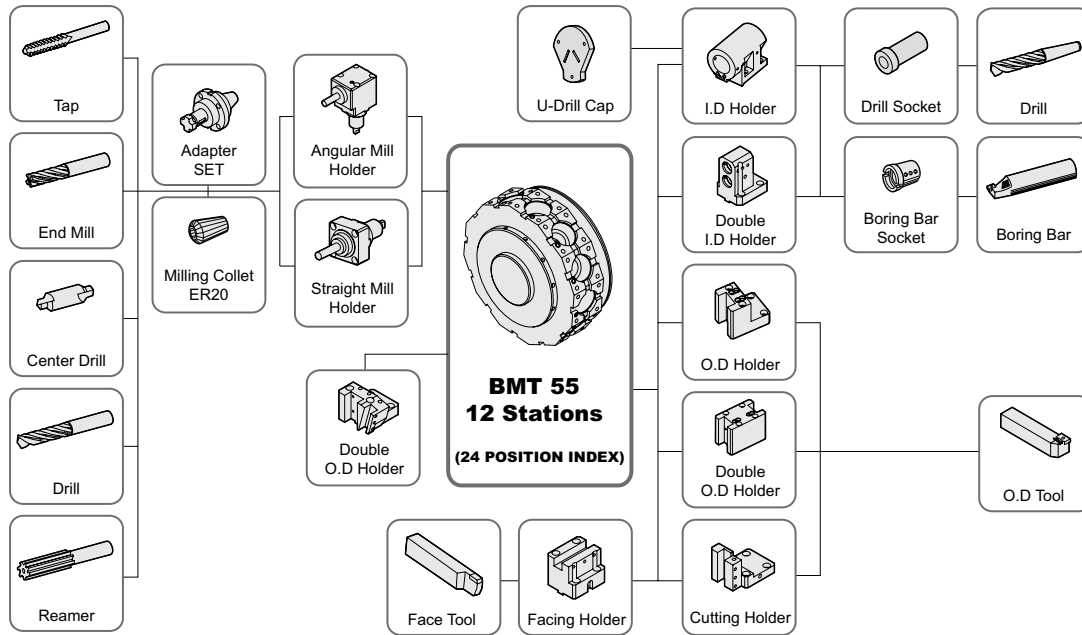
ITEM			L160A/LA 230LA		L230C/LC	
			mm Unit	inch Unit	mm Unit	inch Unit
Turning Holder	O.D Holder	Right/Left	-	-	-	-
		Extension	-	-	1	1
	Facing Holder		1	1	1	1
	Cutting Holder		-	-	-	-
Boring Holder	I.D Holder	Single	5	5	5	5
	U-Drill Holder	Cap	1	1	1	1
Driven Holder	Straight Mill Holder	Standard	-	-	-	-
		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)



Tooling Parts Detail

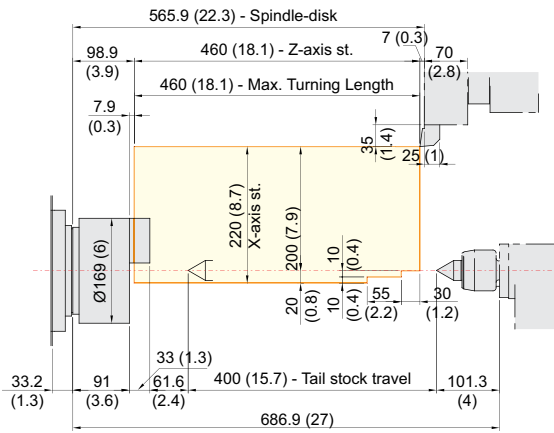
ITEM			L160MA/LMA L230MA/LMA 230MC		L160LMSA L230LMSA	
			mm Unit	inch Unit	mm Unit	inch Unit
Turning Holder	O.D Holder	Right/Left	4	4	2	2
		Double	-	-	1	1
	Cutting Holder	1	1	1	1	
Boring Holder	I.D Holder	Single	4	4	4	4
		Double	-	-	1	1
Driven Holder	U-Drill Holder	Cap (Single)	1	1	1	1
		Cap (Double)	-	-	1	1
	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	Ø8×Ø20 (Ø5/16"×Ø3/4")	-	-	1	1
		Ø12×Ø20 (Ø1/2"×Ø3/4")	-	-	1	1
		Ø16×Ø20 (Ø5/8"×Ø3/4")	-	-	1	1
		Ø10×Ø40 (Ø3/8"×Ø1 1/2")	1	1	1	1
		Ø12×Ø40 (Ø1/2"×Ø1 1/2")	1	1	1	1
		Ø16×Ø40 (Ø5/8"×Ø1 1/2")	1	1	1	1
		Ø20×Ø40 (Ø3/4"×Ø1 1/2")	1	1	1	1
		Ø25×Ø40 (Ø1"×Ø1 1/2")	1	1	1	1
	Ø32×Ø40 (Ø1 1/4"×Ø1 1/2")	1	1	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	

Tooling Travel Range

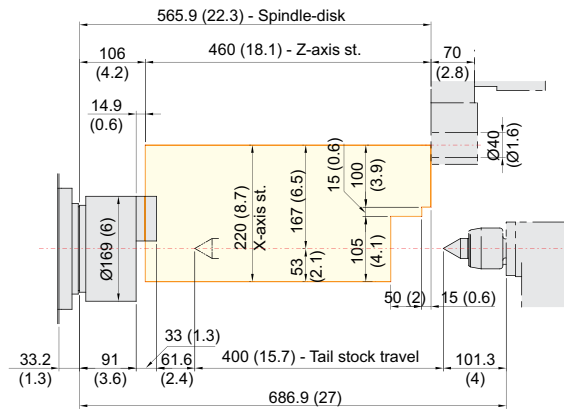
unit : mm(in)

L160A

OD tool

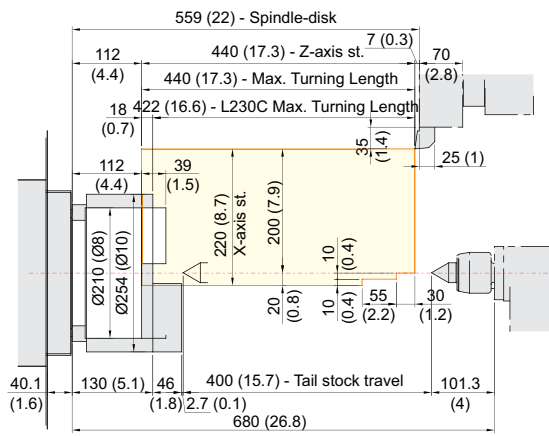


ID tool

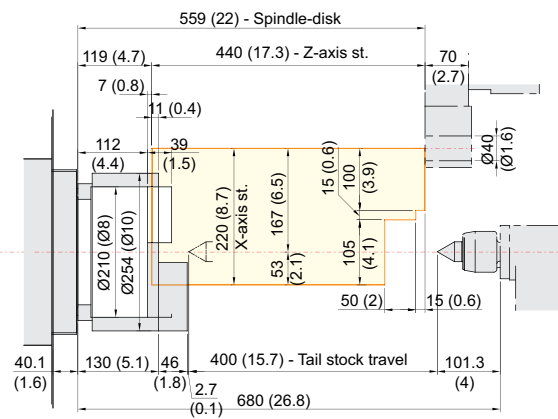


L230A/C

OD tool



ID tool



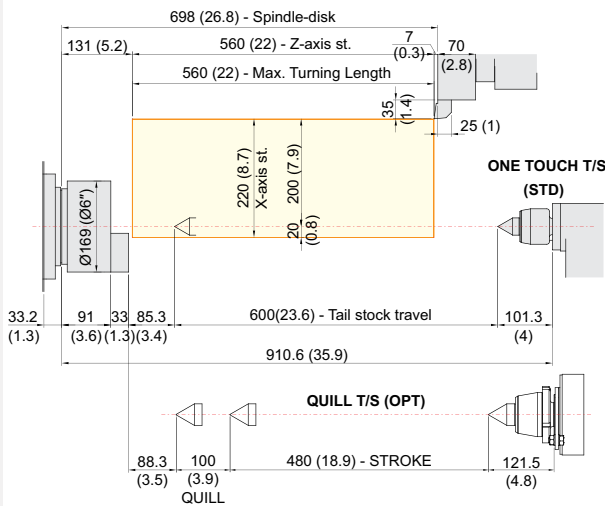
SPECIFICATIONS

Tooling Travel Range

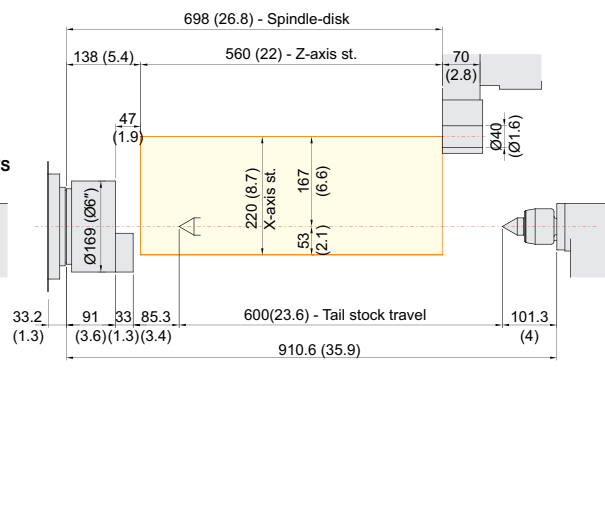
unit : mm(in)

L160LA

OD tool

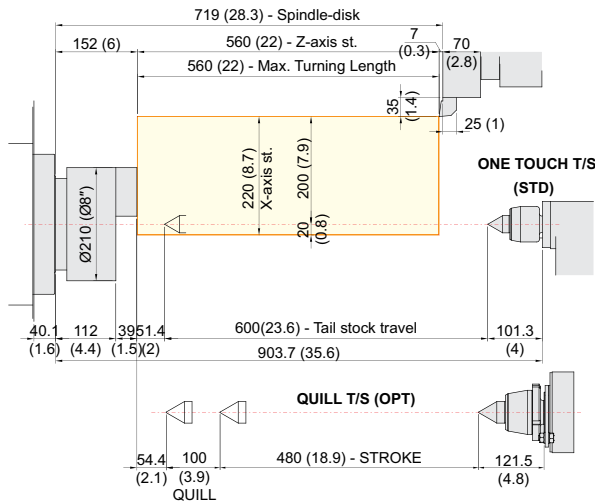


ID tool

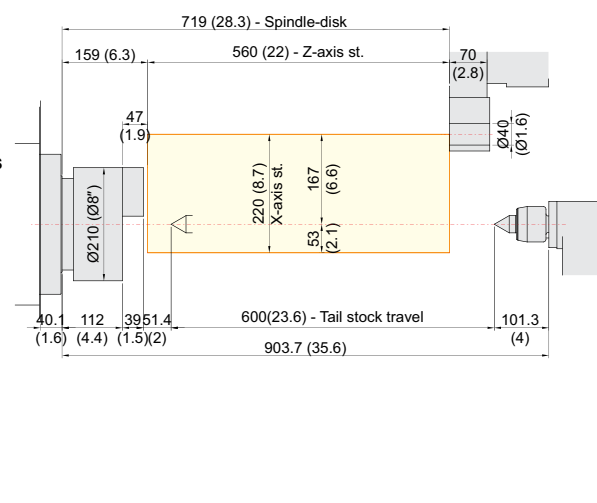


L230LA

OD tool



ID tool



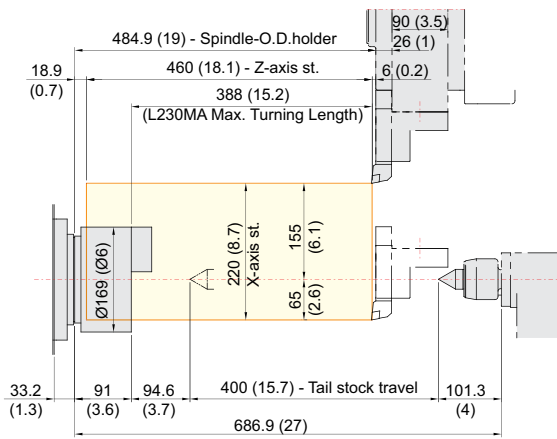
SPECIFICATIONS

Tooling Travel Range

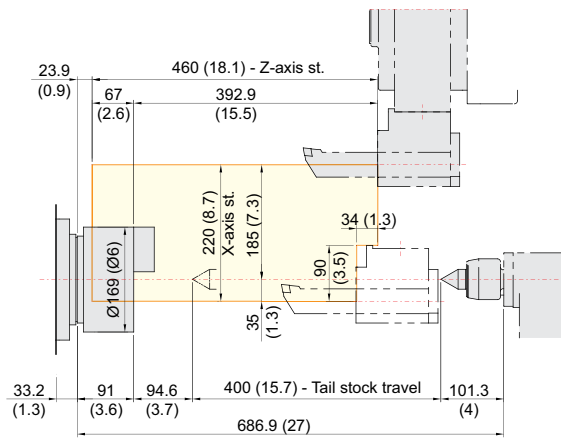
unit : mm(in)

L160MA

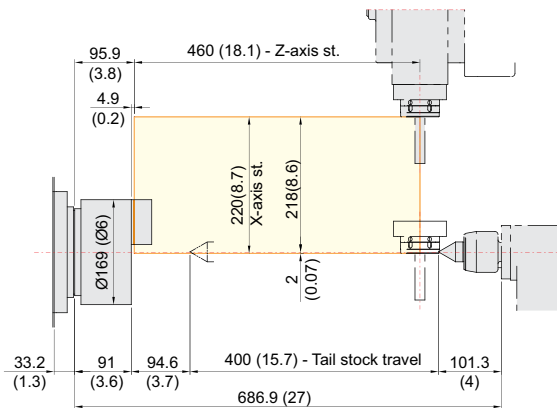
OD tool



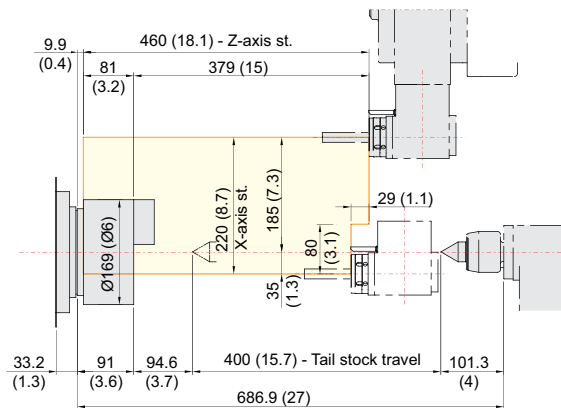
ID tool



Straight Mill Holder



Angular Mill Holder



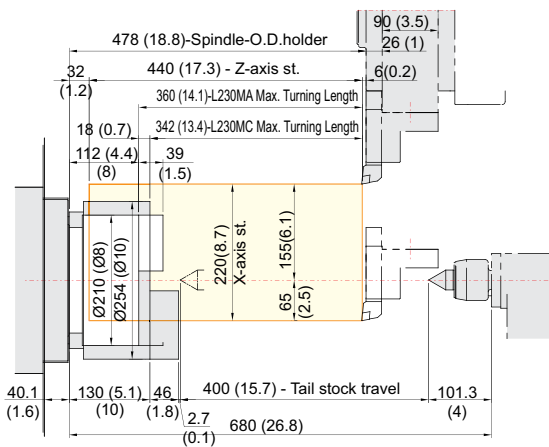
SPECIFICATIONS

Tooling Travel Range

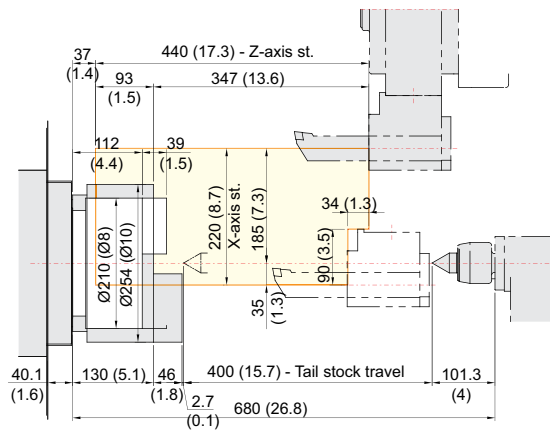
unit : mm(in)

L230MA/MC

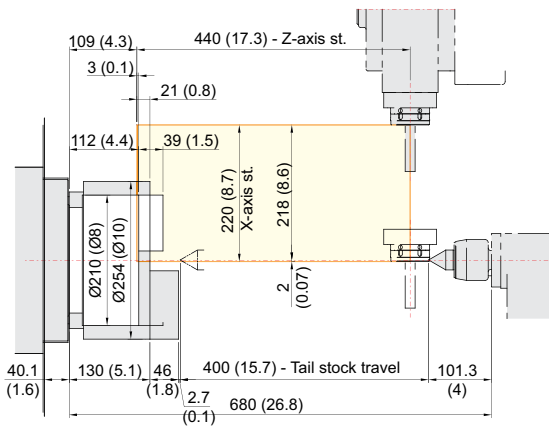
OD tool



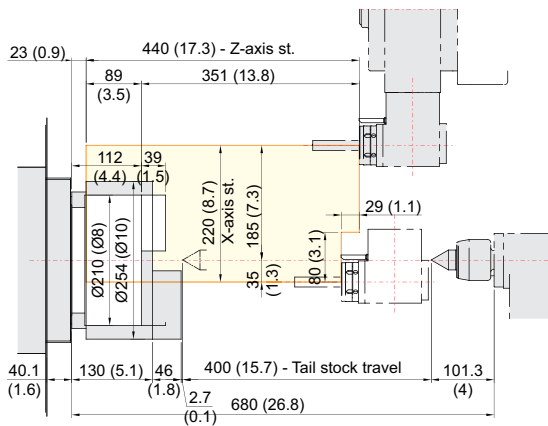
ID tool



Straight Mill Holder



Angular Mill Holder



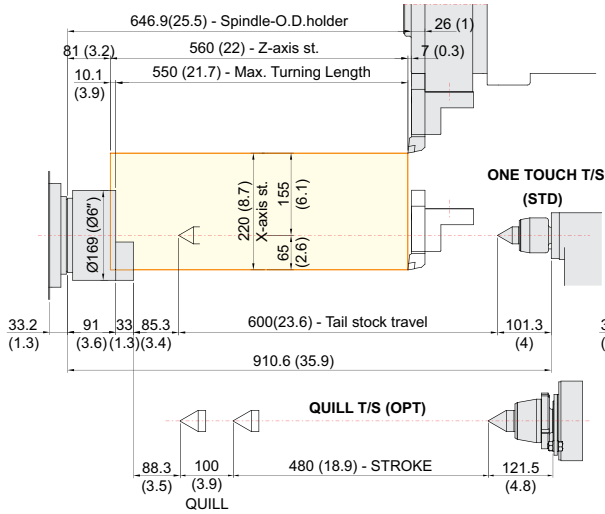
SPECIFICATIONS

Tooling Travel Range

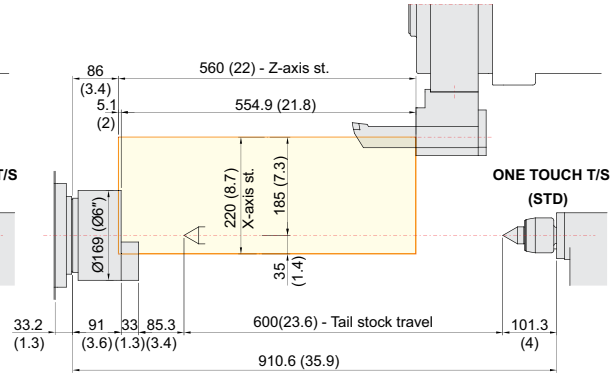
unit : mm(in)

L160LMA

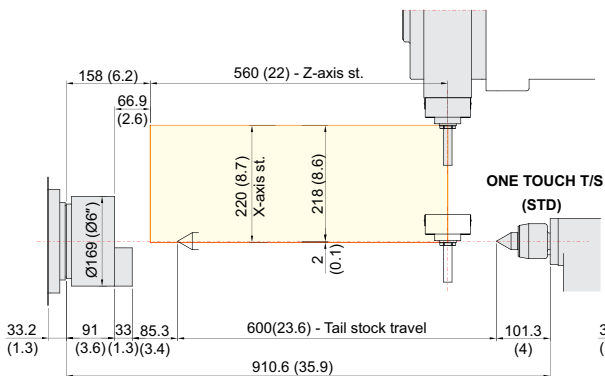
OD tool



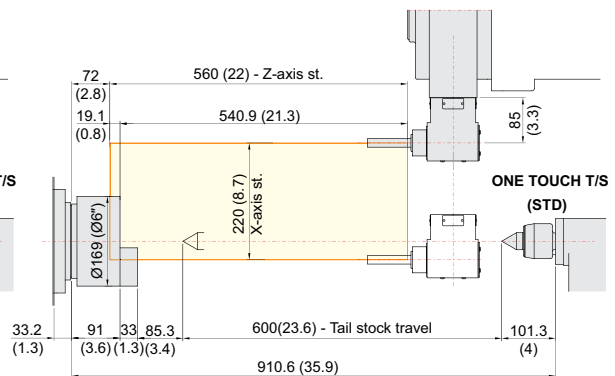
ID tool



Straight Mill Holder



Angular Mill Holder



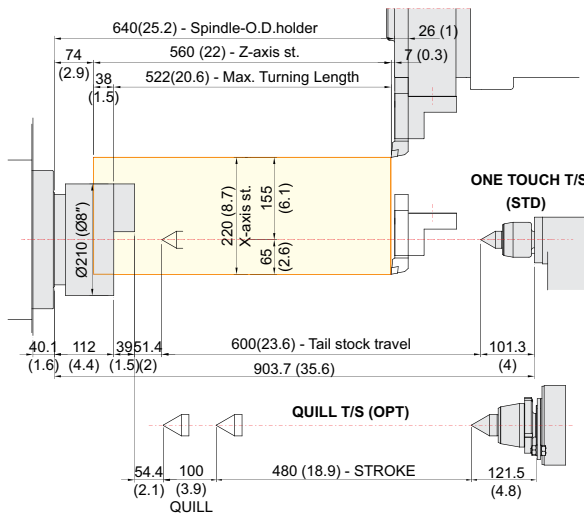
SPECIFICATIONS

Tooling Travel Range

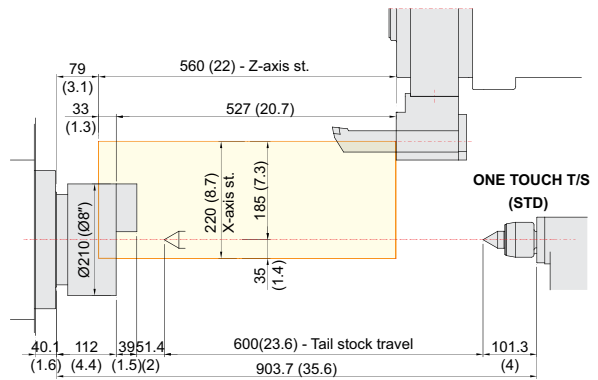
unit : mm(in)

L2300LMA

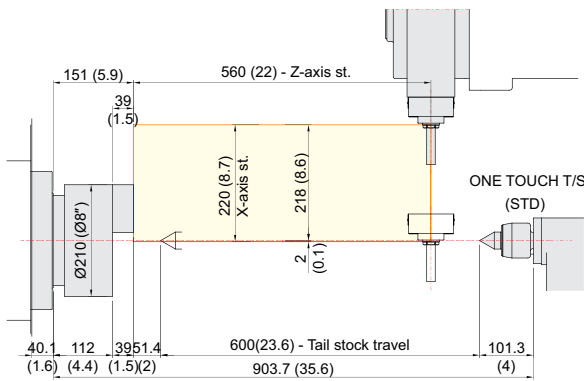
OD tool



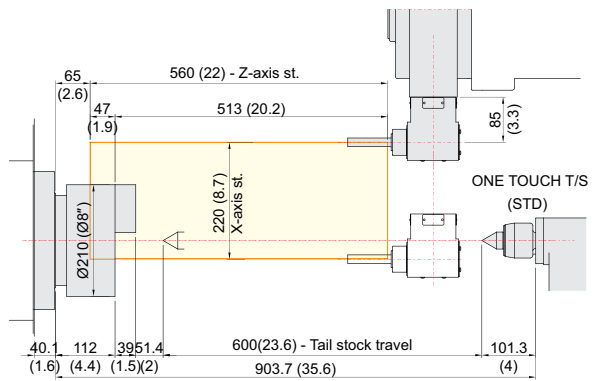
ID tool



Straight Mill Holder



Angular Mill Holder



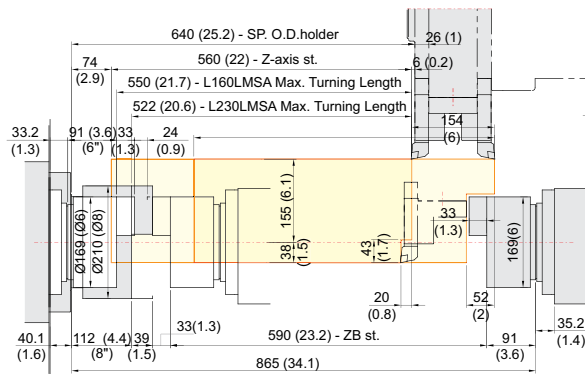
SPECIFICATIONS

Tooling Travel Range

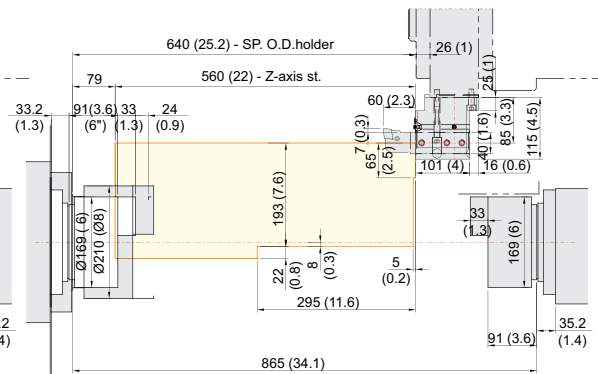
unit : mm(in)

L160LMSA/230LMSA

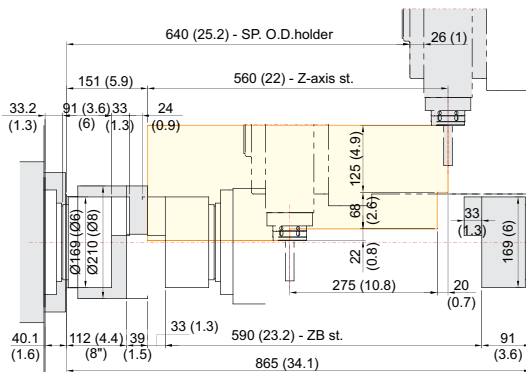
OD tool



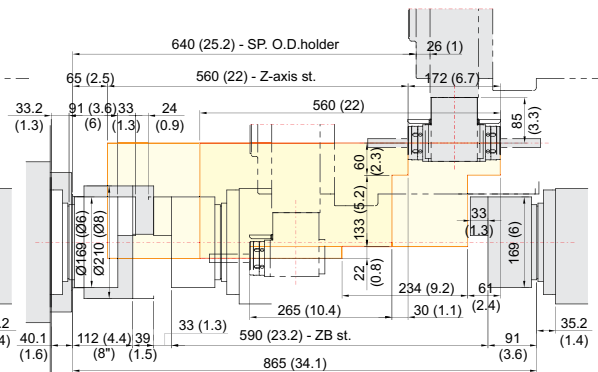
ID tool



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	6"				
		Sub	-				6"
	Spindle Bore	Main	Ø53 (2.1")				
		Sub	-				Ø53 (2.1")
	Spindle Speed (rpm)	Main	6,000 [6,000]				
		Sub	-				5,000 [5,000]
	Motor (Max/Cont.)	Main	11/7.5(15/10) [10.8/9(14.5/12)]				
		Sub	-				5.5/3.7(7.4/5) [5.9/4.9 (7.9/6.6)]
	Torque (Max/Cont.)	Main	70/47.7 (51.6/35.2) [69/57.3 (50.9/42.3)]				
		Sub	-				47.2/31.8 (34.8/23.5) [38/31.6 (28/23.3)]
	Spindle Type	Main	BELT				
		Sub	-				BELT
	Spindle Nose	Main	A2-5				
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	36/36				
	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	O.D/ I.D	Ø25 (1")				
		I.D	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 [21.6/17.6]	-	23.5/14.2 (17.3/10.5) [21.6/17.6 (15.9/13)]	
	Collet Size	mm(in)	-	Ø16 (0.6") ER25	-	Ø16 (0.6") ER25	
	Type	-	-	BMT55	-	BMT55	
TAIL STOCK	Taper	-	MT4				-
	Quill Dia.	mm(in)	Ø56 (2.2")				
	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 [HYUNDAI-ITROL]				

*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

Specifications

[] : Option

ITEM		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)	Ø310 (12.2")	Ø355 (14")	Ø310 (12.2")	
	Max. Turning Length	mm(in)	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 (20/15) [22/18.5 (29.5/25)]			
		Sub	-			5.5/3.7 (7.4/5) [5.9/4.9 (7.9/6.6)]
	Torque (Max/Cont.)	Main	286.4/210 (211.2/154.9) [252/211.9 (185.9/156.3)]			
		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)	220/400 (8.7"/15.7")	220/560 (8.7"/22")	220/560/590 (8.7"/22"/23.2")	
	Rapid Traverse Rate (X/Z/ZB)	m/mi	36/36			
	Slide Type	-	X-Axis : BALL TYPE LM GUIDE, Z-Axis : ROLLER TYPE LM GUIDE			
TURRET	No. of Tools	EA	12 [24]	12	12 [24]	
	Tool Size	O.D/ I.D	□ 25 (1")/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			
	Torque (Max/Cont.)	N·m(lbf·ft)	23.5/14.2 (17.3/10.5) [21.6/17.6 (15.9/13)]	-	23.5/14.2 (17.3/10.5) [21.6/17.6 (15.9/13)]	
	Collet Size	mm(in)	Ø16 (0.6") ER25			
	Type	-	BMT55			
TAIL STOCK	Taper	-	MT4			
	Quill Dia.	mm(in)	Ø56 (2.2")			
	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	25	22	25	27
	Thickness of Power Cable	sq	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 [HYUNDAI-iTROL]			

*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)

The existing L230A model was changed to KL2300A. Please refer to KL2300A catalog for details. | Specifications are subject to change without notice for improvement.

SPECIFICATIONS

Specifications

[] : Option

ITEM			L230C	L230MC	
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")	
	Max. Turning Length	mm(in)	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)	mm(in)	220/440 (8.7"/17.3")	220/400 (8.7"/15.7")	
	Rapid Traverse Rate (X/Z/ZB)	m/min(ipm)	36/36		
	Slide Type	-	X-Axis : BALL TYPE LM GUIDE, Z-Axis : ROLLER TYPE LM GUIDE		
TURRET	No. of Tools	EA	12		
	Tool Size	O.D	mm(in)	□25 (1")	
		I.D	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	-	-	BMT55	
TAIL STOCK	Taper	-	MT4		
	Quill Dia.	mm(in)	Ø56 (2.2")		
	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	8.4 inch / 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	F1%, F5%, F25% / 50%, F100%
Override cancel	
Feed per minute	G98
Feed per revolution	G99
Look-ahead block	1 block
Program input	
Tape Code	EIA / ISO
Optional block skip	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 ~ #149, #500 ~ #549
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	M 19
Rigid tapping	
Constant surface speed control	G96, G97
Tool function / Tool compensation	
Tool function	Tool Number 2 digit + Offset 2 digit
Tool life management	
Tool offset pairs	64 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	
Optional block skip	9 ea
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

HYUNDAI-iTROL

Control & Composition	
Number of axis/Spindles	2 axes (X, Z) / 3 axes (X, Z, C)
Number of axis/Spindles, max.	8 axes (Axis + Spindle)
Color display	TFT 10.4" Color (800 x 600)
Keyboard	QWERTY Full Keyboard
Part program storage	1MB, 3MB, 5MB
Addition of part program on CF card	
Transfer Function	
Feedrate override	0% ~ 200%
Transfer value input range	± 999999999
Unlimited rotation of rotation axis	
Acc./Dec. with jerk limitation	
Measuring systems 1 and 2, selectable	
Travel to fixed stop	
Auto servo drive tuning	
Spindle Function	
Spindle override	0% ~ 150%
Spindle speed, max. programmable value range	1000000 ~ 0.0001
Automatic gear stage selection	
Spindle orientation	
Spindle speed limitation	
Rigid tapping	
Spindle control with PLC	
Interpolation	
Linear interpolation axis, max.	4 axis
Circle via center point and end point	
Circle via interpolation point	
Helical interpolation	
Non-uniform rational B splines	
Continuous - path mode with programmable rounding clearance	
Program Function	
Subroutine levels, max.	7
Interrupt routines, max.	2
Number of levels for skip blocks	2
Polar Coordinates	
Dimensions inch/metric, changeover manually or via program	
Dynamic preprocessing memory FIFO	
Look ahead	1
Absolute/Incremental command	G90 / G91
Scaling/Rotation	
Read/Write system variables	
Block search	
Edit background	
Processing program number, max.	750
Using of CF Card, USB	
Basic coordinate number, max.	1
Work coordinate number, max.	100
Basic/Work coordinate programming change	
Scratching function	
Global and Local user data (GUD/LUD)	
Global program user data	
Conversational Cycle Program	
Tool Function	
Tool radius compensations	
Tool offset selection via T/D numbers	
Tools / Cutting edges in tool list	128 / 256, 256 / 512
Monitoring Function	
Working area limit	
Software and Hardware limit	
Zero-speed/Clamping monitoring	
2D/3D protection zones	
Contour monitoring	

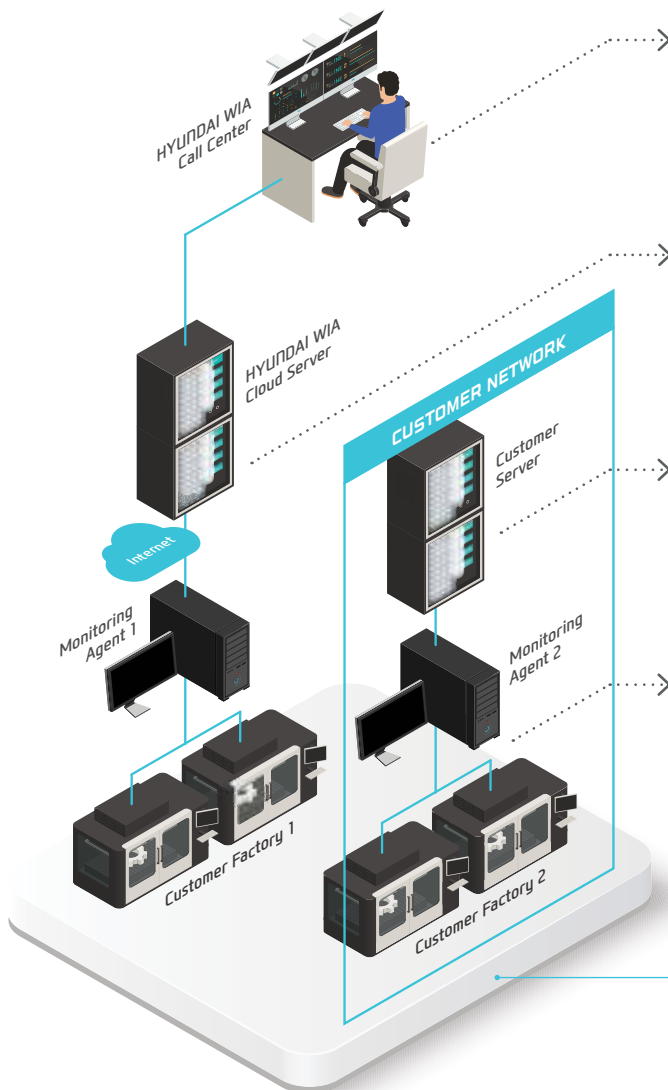
Compensation	
Backlash compensation	
Leadscrew error compensation	
Measuring system error compensation	
Feedforward control (Speed control)	
Safety Function	
Safe torque off (STO)	
Safe brake control (SBC)	
Safe stop 1 (SS1)	
Diagnostic Function	
Alarm/Message . Alarm log	
PLC status/LAD online display	
PLC remote connection (Ethernet)	
Automation Support Function	
Actual velocity display	
Tool life management	As time / As amount
Work counter/Cycle time	Embedded
2D simulation	
Manual Operation	
Manual handle/Log transfer	
Manual measurement of workpiece / tool offset	
Automatic tool/Workpiece measurement	
Automatic/Program reference approach	
Automatic Operation	
Program run as using CF card/USB	
Program control/modification	
Block search	
Reposition	
Preset (Set actual value)	
Data Transmission	
Ethernet network	
USB memory stick & CF card	
Convenience Function	
Processing setting	Coordinate system setting, Auto tool length measurement
Processing support	Tool Monitoring, Spindle overload monitoring
Maintenance	Turret Guidance, I/O monitoring, Manual
Management	Soft MCP, M/G code List
SMART machining	
Energy saving function (ECO)	
Machine Monitoring System (MMS Lite)	
Language	
Standard support language	Chinese Simplified, English, Korean
Option	
Maximum skip block number	10
DRF offset	
MDI program save/load	
Teach-In mode	
3D simulation	Except for working area/Collision check
Real time simulation	
Shop Turn	Conversational Program
Spline interpolation	
Program remote control in network	
Language	Chinese Traditional, French, German, Italian, Portuguese, Spanish

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.



HW-MMS Remote

Hyundai Wia Call Center's remote diagnosis service provides a HMI/video diagnostic function.



HW-MMS Cloud

A cloud server-based equipment monitoring system for collecting and analyzing facility operation data.



HW-MMS Edge

A client server-based tool monitoring system for collection/analysis of facility operation data. (Compatible with client MES / ERP interface)



HW-MMS PT

This is a facility big data-based smart factory solution that collects and analyzes changes in spindle/feed data and NC processing files

HYUNDAI WIA
Smart Factory Solution



L160MA
Movie



L160LMSA
Movie



L230LMSA
Movie



L230LMSA
3D Movie



You Tube HYUNDAI WIA MT

www.youtube.com/HYUNDAIWIAMT

EXPERIENCE THE NEW TECHNOLOGY

With its top-quality HYUNDAI WIA machine tool creates a new and better world.



<http://machine.hyundai-wia.com>

HYUNDAI WIA Machine Tools
Global Links

HEADQUARTER

Changwon Technical Center/R&D Center/Factory 153, Jeongdong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea TEL : +82 55 280 9114 FAX : +82 55 282 9114

Overseas Sales Team /R&D Center 37, Cheoldobangmulgwan-ro, Uiwang-si, Gyeonggi-do, Korea TEL : +82 31 8090 2539

OVERSEAS OFFICES

HYUNDAI WIA Machine America corp. 450 Commerce Blvd, Carlstadt, NJ 07072, USA TEL : +1-201-987-7298

HYUNDAI WIA Europe GmbH Alexander-Fleming-Ring 57, 65428 Rüsselsheim Germany TEL : +49-0-6142-9256-0

HYUNDAI WIA Machine Tools China 2-3F, Bldg6, No.1535 Hongmei Road, Xuhui District, Shanghai, China TEL : +86-21-6427-9885

India Branch Office #4/169, 1st Floor, LOTTE BLDG, Rajiv Gandhi Salai, (OMR), Kandanchavadi, Chennai - 600096, Tamilnadu, India TEL : +91-76-0490-3348

Vietnam Branch Office Flat number 05, Service and Trade Center of Viet Huong Industrial Zone, Highway 13, Thuan Giao, Thuan An, Binh Duong, Vietnam TEL : +84-3-5399-5099