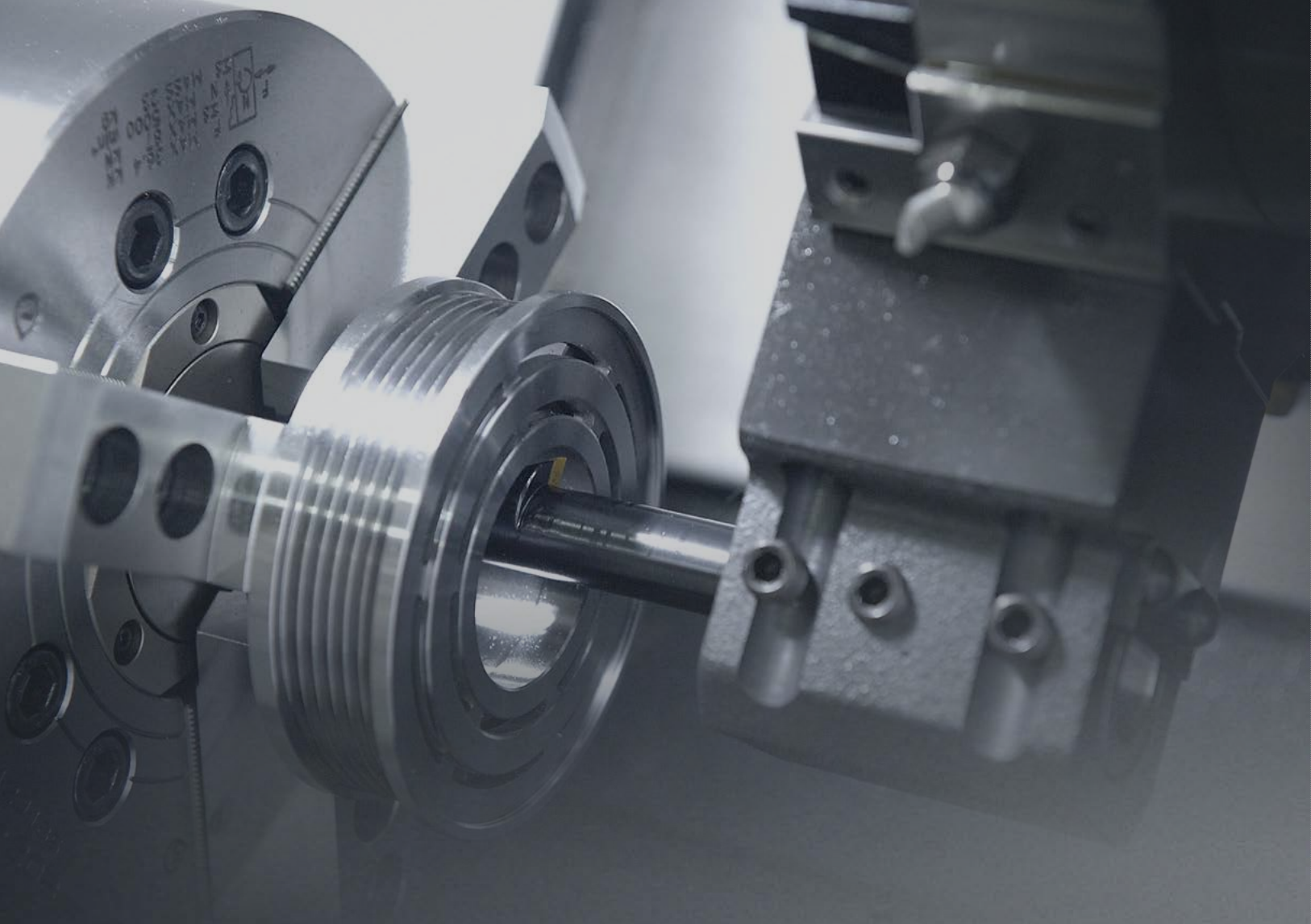
HYUNDAI
MOTOR GROUP

E 160 Series

E160A | E160C

HYUNDAI WIA Efficient Type CNC Turning Center

HYUNDAI WIA | CREATING VALUE IN SEAMLESS MOBILITY



Technical Leader

The CNC Turning Center E160 Series, designed by Hyundai WIA with years of expertise and the latest technology, maximizes productivity by enhancing both technical performance and economic efficiency.

		E160A	E160C
Max. Turning Dia.	mm(in)	Ø280 (Ø11″)	Ø280 (Ø11″)
Max. Turning Length	mm(in)	300 (11.8″)	280 (11″)
Chuck Size	inch	6″	8″
Bar Capacity	mm(in)	Ø45 (Ø1.8″)	Ø51 (Ø2″)
Sp. Speed	r/min	6,000	4,000 [4,000]
Sp. Motor (Max./Cont.)	kW(HP)	11/7.5 (15/10)	11/7.5 (15/10) [15/11 (20/15)]
Travel (X/Z)	mm(in)	165/330 (6.5″/13″)	165/330 (6.5″/13″)
No. of Tools	EA	12	10

[ ] : Option

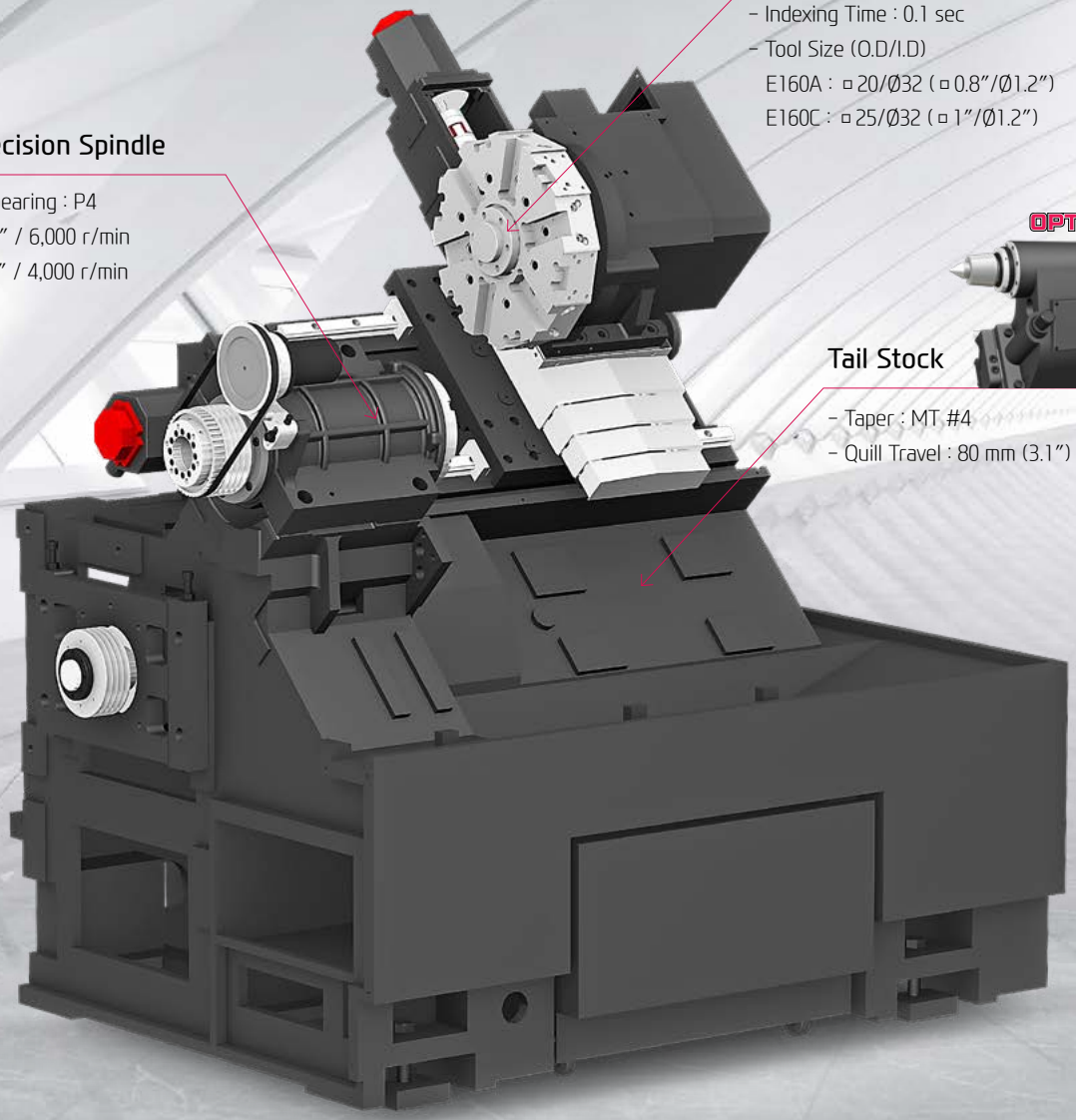
E 160 Series

High Speed, Rigidity & Productivity-CNC Turning Center

- 45° slanted one-piece bed structure with high rigidity
- Stabilized unit structure to minimize thermal displacement
- Impressive rapid traverse rate: 30m/min
- The most reliable high speed servo turret : 0.1sec/step
- Environmental friendly design
- Compact design suitable for installation in restricted space
- Ergonomic design for convenient access to chuck and tool

01 BASIC STRUCTURE

The Best Productivity 6 inch / 8 inch Compact CNC Turning Center



Turret

- Indexing Time : 0.1 sec
- Tool Size (O.D/I.D)
  E160A : □20/Ø32 (□0.8″/Ø1.2″)
  E160C : □25/Ø32 (□1″/Ø1.2″)

High Precision Spindle

- Angular bearing : P4
- E160A : 6″ / 6,000 r/min
- E160C : 8″ / 4,000 r/min

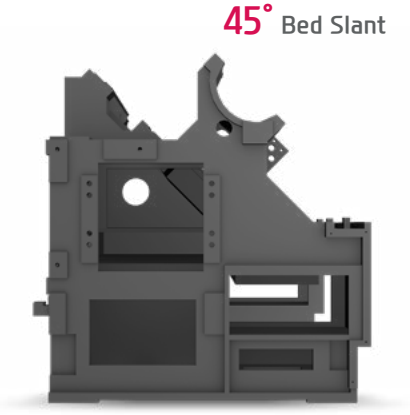
OPTION

Tail Stock

- Taper : MT #4
- Quill Travel : 80 mm (3.1″)

REDUCTION OF NON-CUTTING TIME BY FAST RAPID SPEED

ALL-IN-ONE TYPE OF BED



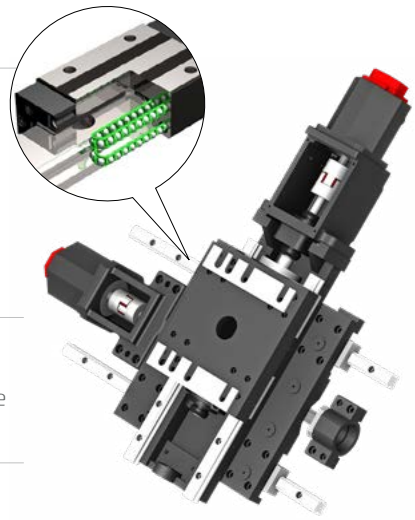
High Precision & Rigidity One-piece Structure

The E160 Series is designed with a 45 degree slanted bed combined with square type and tube type rib structure. This special design enhances rigidity and vibration absorbing capability, allowing powerful cutting with high precision.

Floor Space (L×W)

1,940×1,660 mm (76.4"×65.4")

GUIDEWAY



LM Guideway

LM guideway with the rapid traverse rate of 30 m/min (1,181ipm) is installed on E160 Series.
LM guideway maintains high precision even after a long periods of operation. LM guideway`s wide surface minimizes attrition and slipping which can occur often during machining.

Ball Screw

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

Travel (X/Z)

165/330 mm (6.5"/13")

Rapid Traverse Rate (X/Z)

30/30 m/min (1,181/1,181 ipm)

02 HIGH **PRECISION**

Excellent Performance, High Accuracy Cutting CNC Turning Center

Spindle Specifications

[ ] : Option

ITEM	Spindle Speed	Motor (Max./Cont.)	Torque (Max.)	Driving Method
E160A	FANUC : **6,000** r/min	**11/7.5** kW (15/10 HP)	**70/35.8** N·m (51.6/26.4 lbf·ft)	Belt
E160C	FANUC : **4,000** r/min	**11/7.5** kW (15/10 HP)	**126/64.4** N·m (92.9/47.5 lbf·ft)	
	[FANUC : **4,000** r/min]	**15/11** kW (20/15 HP)	**171.8/126** N·m (126.7/92.9 lbf·ft)	

HIGH ACCURACY & EXCELLENT PERFORMANCE

SPINDLE

High Precision Spindle

The E160 Series spindle was designed with a precise and highly rigid spindle structure by adopting a high speed angular ball bearing in the DB array.

To ensure good safety in the powerful and heavy cutting, the spindle is designed with an angular bearing structure with P4 class.

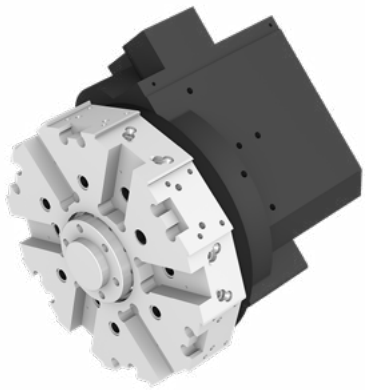
TURRET

Servo Turret

Continued accuracy of the turret indexing position is maintained by a powerful, high speed servo motor. The 3 piece coupling and non-lift method applied design prevents foreign material from getting into the turret.

Turret Specifications

ITEM	No. of Tools	Tool Size (O.D/I.D)	Indexing Time
E160A	12 EA	□ 20/Ø32 mm (□ 0.8″/Ø1.2″)	0.1 sec
E160C	10 EA	□ 25/Ø32 mm (□ 1″/Ø1.2″)	



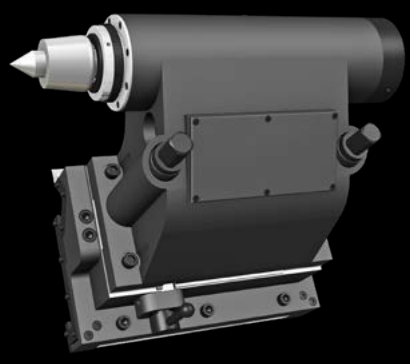
TAIL STOCK

OPTION

MT#4 Tail Stock

Tailstock enables stable machining of high quality products where quill travels up to 80mm (3″).

- Quill Dia. : Ø55 mm (Ø2.2″)
- Quill Travel : 80 mm (3.1″)

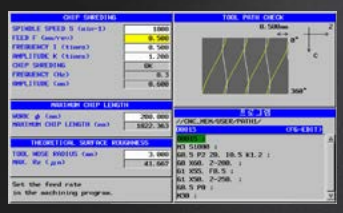


03 HYUNDAI WIA FANUC – SMART PLUS

The Compatible All-round Control

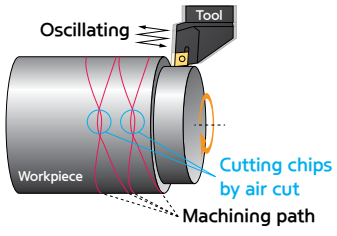
15″ Touch-type Monitor as a standard

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



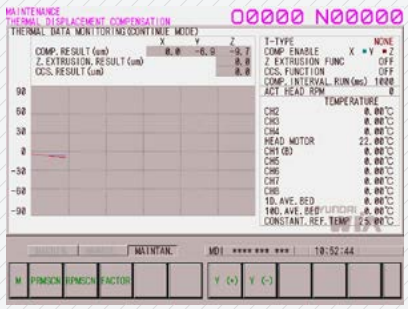
Servo Learning Oscilliation Function for Chip Breaking OPTION

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



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

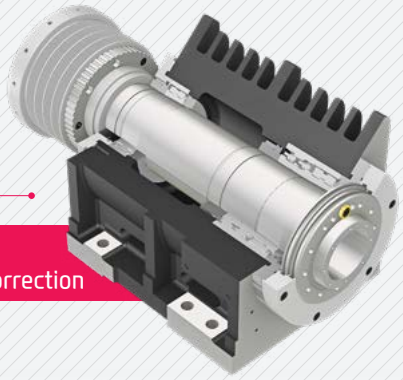
8Ch. Thermal displacement compensation (Opt.)



Control Software

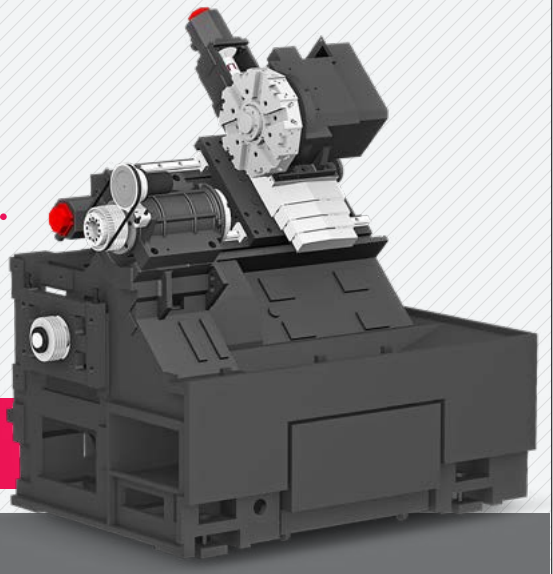
Thermal Sensor

Spindle thermal displacement error correction



Thermal Sensor

Structure thermal displacement error correction



Machine tools generate thermal displacement due to heat during machining.
Hyundai Wia machine tools detect thermal changes through thermal sensors installed on the main thermal sources of the machine.
In addition, a thermal displacement compensation device that predicts the amount of thermal displacement according to the amount of thermal change and provides a command to the motor with a compensated value to maintain consistent precision is provided as an option.

SMART CNC (FANUC SMART PLUS)

1. Dialogue Program (Smart Guide-i)
This software offers the maximum user convenience through dialogue manipulation from setup to processing. This includes writing processing programs and simulation checks.

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

SPECIFICATIONS

Standard & Optional

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

Spindle		E160A	E160C
Main Spindle Hollow Chuck 3 Jaw	6″	●	–
	8″	○	●
Main Spindle Solid Chuck 3 Jaw	6″	○	–
	8″	–	○
Standard Soft Jaw (1set)		●	●
Chuck Clamp Foot Switch		●	●
2 Steps Hyd, Pressure Device		○	○
Spindle Inside Stopper		☆	☆
5° Index		☆	☆
C-Axis (0.001°)		–	–
Chuck Open/Close Confirmation Device		○	○
2 Steps Chuck Foot Switch		☆	☆
Turret			
Tool Holder		●	●
Mill Turret	VDI	–	–
Straight Milling Head	Collet Type,1ea	–	–
Angular Milling Head	Collet Type,1ea	–	–
Straight Milling Head	Adapter Type	–	–
Angular Milling Head	Adapter Type	–	–
Boring Sleeve		●	●
Drill Socket		●	●
U-Drill Holder		○	○
U-Drill Holder Sleeve		○	○
O.D Extension Holder	For Outside Diameter	☆	☆
Angle Head		–	–
Tail Stock & Steady Rest			
Quill Type Tail Stock		○	○
Programmable Tail Stock		–	–
Manual Type Hyd. Steady Rest		–	–
Standard Live Center (Tail Stock : Standard)		○	○
High Precesion Live Center		☆	☆
2 Steps Tail Stock Pressure System		☆	☆
Quill Forward/Reverse Confirmation Device		○	○
Tail Stock Foot Switch		☆	☆
Coolant & Air Blow			
Standard Coolant (Nozzle)		●	●
Chuck Coolant (Upper Chuck)		○	○
Gun Coolant		○	○
Through Spindle Coolant (Only for Special Chuck)		☆	☆
Thru Coolant for Live Tool		–	–
Chuck Air Blow (Upper Chuck)		○	○
Tail Stock Air Blow (Upper Tail Stock)		☆	☆
Turret Air Blow		☆	☆
Air Gun		○	○
Through Spindle Air Blow (Only for Special Chuck)		☆	☆
High Pressure Coolant	0.4Bar (5.8 psi)	●	●
	6Bar (87 psi)	○	○
Power Coolant System (For Automation)		☆	☆
Coolant Chiller		☆	☆
Chip Disposal			
Coolant Tank	130 ℓ (34.3 gal)	●	●
	150 ℓ (39.6 gal)	○	○
Chip Conveyor (Hinge/Scraper)	Rear (Rear)	○	○
	Front (Right)	–	–
	Rear (Right)	○	○
Special Chip Conveyor (Drum Filter)		☆	☆
Chip Wagon	Standard (180 ℓ [47.5 gal])	○	○
	Swing (200 ℓ [52.8 gal])	○	○
	Large Swing (290 ℓ [76.6 gal])	○	○
	Large Size (330 ℓ [87.2 gal])	○	○
	Customized	☆	☆
Safety Device			
Total Splash Guard		●	●
Chuck hydraulic pressure maintenance interlock		○	○

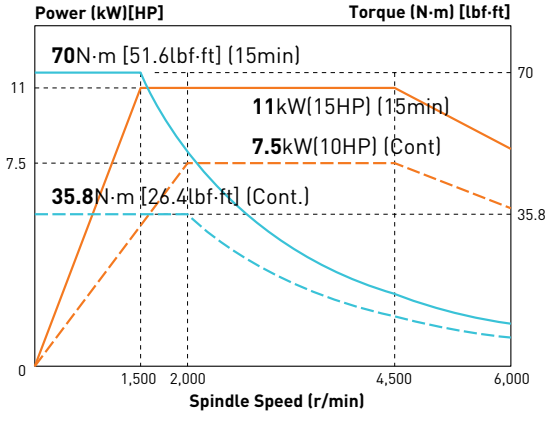
Electric Device		E160A	E160C
Call Light	1 Color : ■	●	●
Call Light & Buzzer	3 Color : ■ ■ ■ B	○	○
Electric Cabinet Light		○	○
Remote MPG		○	○
Work Counter	Digital	○	○
Total Counter	Digital	○	○
Tool Counter	Digital	○	○
Multi Tool Counter	Digital	○	○
Electric Circuit Breaker		○	○
AVR (Auto Voltage Regulator)		☆	☆
Transformer	20kVA	○	○
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		○	○
Oil Mist Collector		☆	☆
Oil Skimmer (Only for Chip Conveyor)		○	○
MQL (Minimal Quantity Lubrication)		☆	☆
Fixture & Automation			
Auto Door		○	○
Auto Shutter (Only for Automatic System)		☆	☆
Sub Operation Pannel		☆	☆
Bar Feeder Interface		○	○
Bar Feeder		☆	☆
Extra M-Code 4ea		○	○
Automation Interface		☆	☆
I/O Extension (IN & OUT)	16 Contact	○	○
	32 Contact	○	○
Parts Catcher	Main SP.	○	○
Turret Work Pusher (For Automation)		☆	☆
Parts Conveyor		☆	☆
Semi Automation System		☆	☆
Hyd. Device			
Standard Hyd. Cylinder	Hollow	●	●
Standard Hyd. Unit	35bar (507.6 psi)/ 15 ℓ (4 gal)	●	●
S/W			
Dialogue Program (HW-DPRO)		○	○
DNC software (HW-eDNC)		○	○
Machine Monitoring System (HW-MMS Cloud)		☆	☆
Smart Guide-i : FANUC		●	●
Smart S/W		☆	☆
ETC			
Tool Box		●	●
Customized Color	Need Munsel No.	☆	☆
CAD & CAM		☆	☆

❖ Thermal Displacement Compensation device is recommended, when more than 6 bar of high pressure coolant is applied, for the high quality machining.

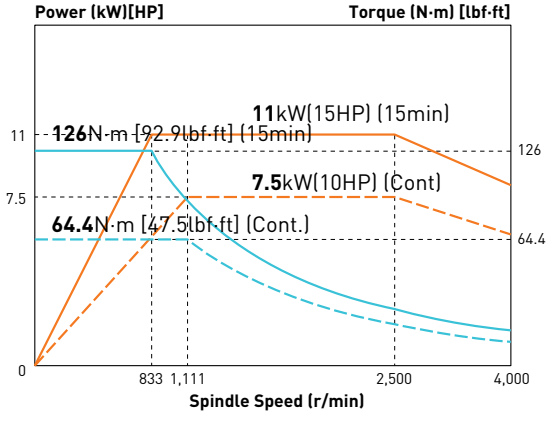
Specifications are subject to change without notice for improvement. / Please refer to the S/W catalog (iRiS) for details by S/W product.

Spindle Output/Torque Diagram

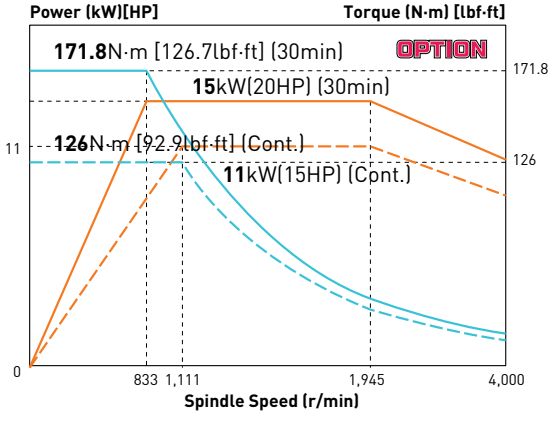
E160A (FANUC)



E160C (FANUC)



E160C (FANUC)

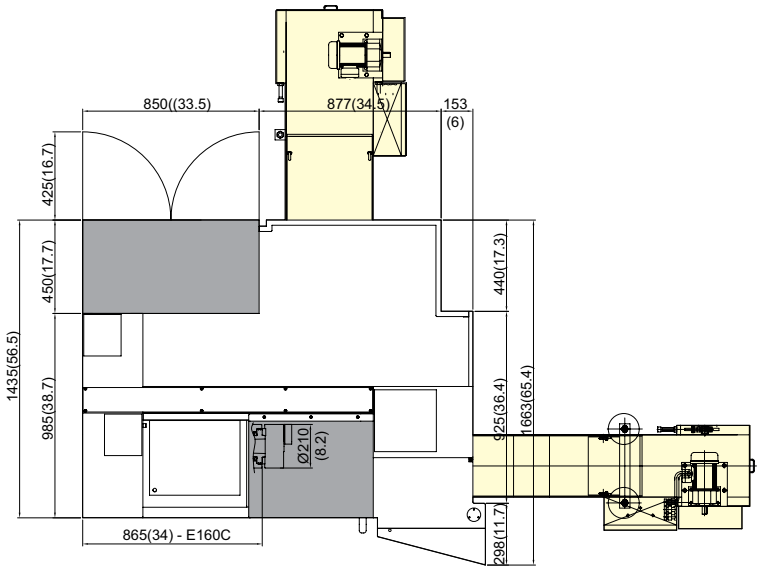


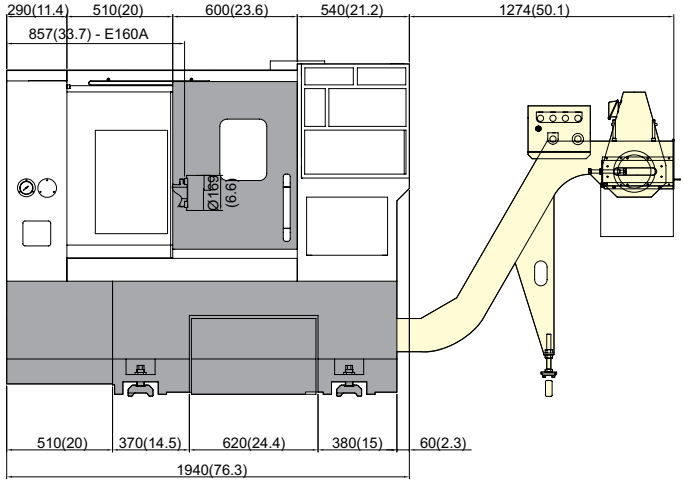
SPECIFICATIONS

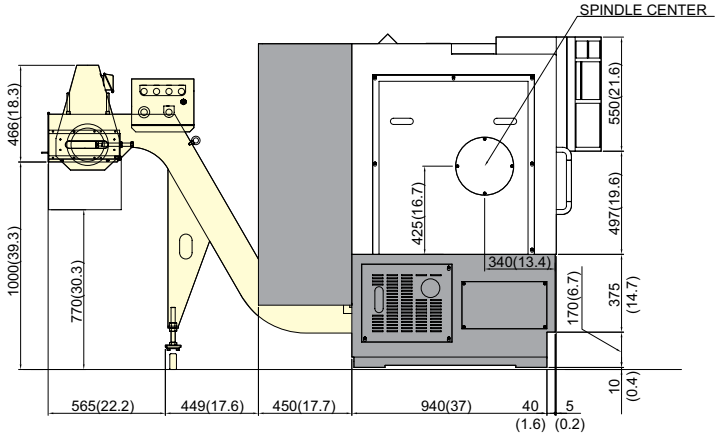
External Dimensions

unit : mm(in)

E160C/A



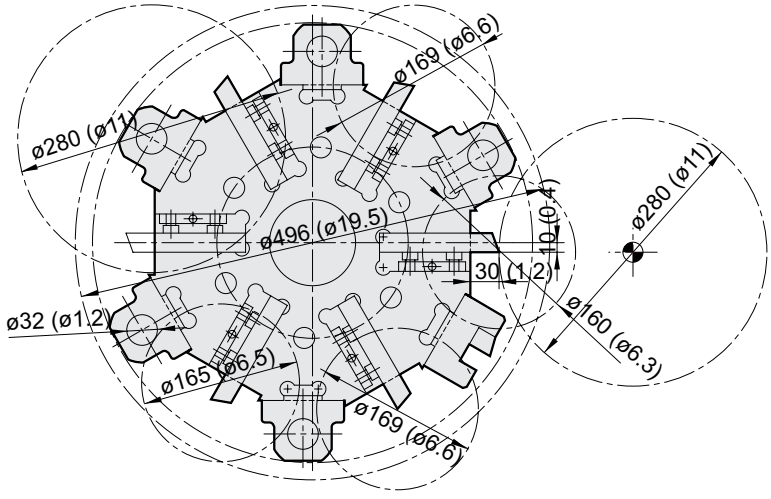




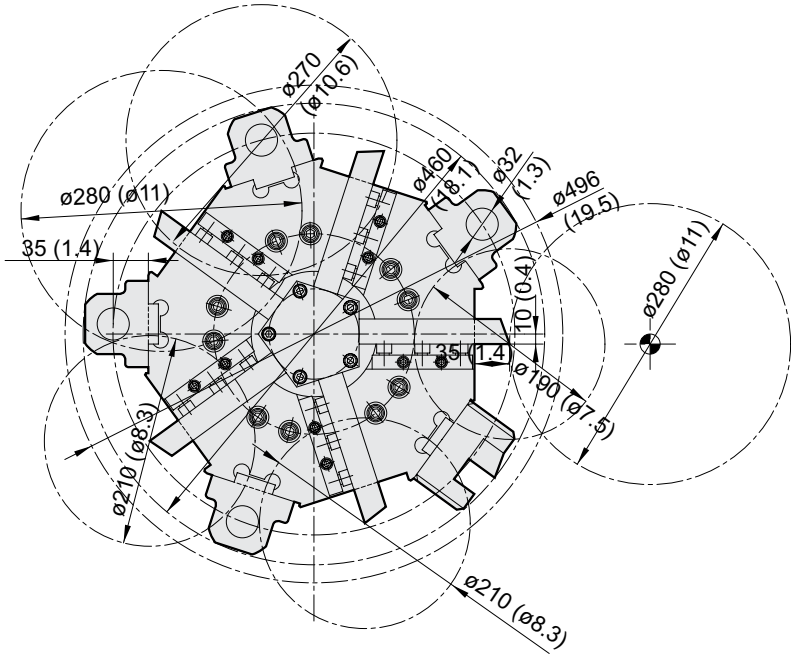
Interference

unit : mm(in)

E160A



E160C

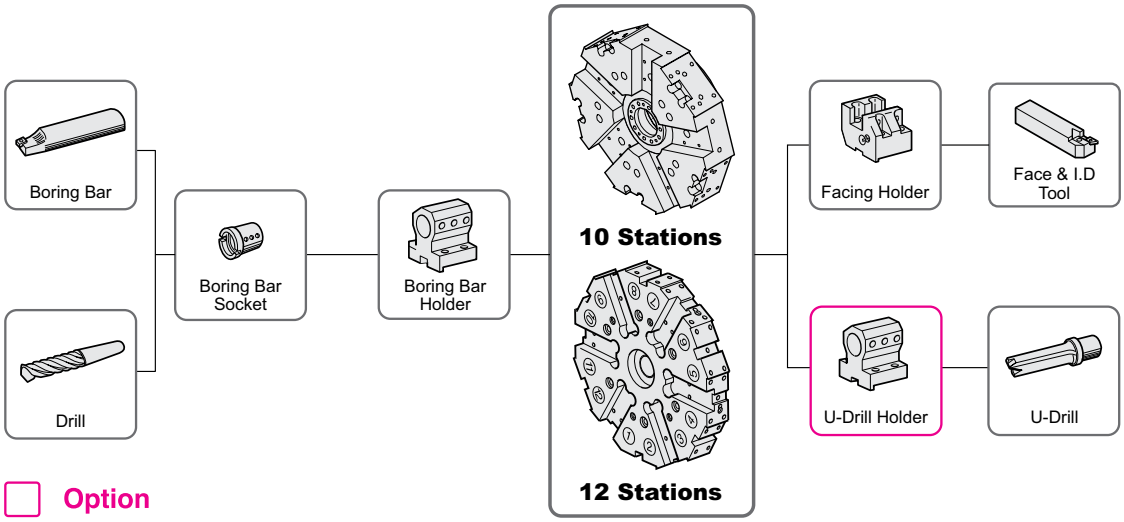


SPECIFICATIONS

Tooling System

unit : mm(in)

E160A/C



Tooling Parts Detail

ITEM			E160A		E160C	
			mm Unit	inch Unit	mm Unit	inch Unit
Turning Holder	O.D Holder	Right/Left	-	-	-	-
		Extension	Opt.	-	-	-
	Facing Holder		1	1	1	1
Boring Holder	I.D Holder	Single	5	5	4	4
		Single : Ø40 (Ø1 1/2'')	-	-	Opt.	-
	U-Drill Holder	Ø20 (Ø3/4")	-	-	Opt.	-
		Ø25 (Ø1")	-	-	Opt.	-
		Ø32 (Ø1 1/4")	-	-	-	Opt.
Socket	Boring	Ø8 (Ø5/16")	1	1	1	1
		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")	Opt.	1	Opt.	1
	Drill	MT 1	1	-	1	-
	ER Collet		-	-	-	-

SPECIFICATIONS

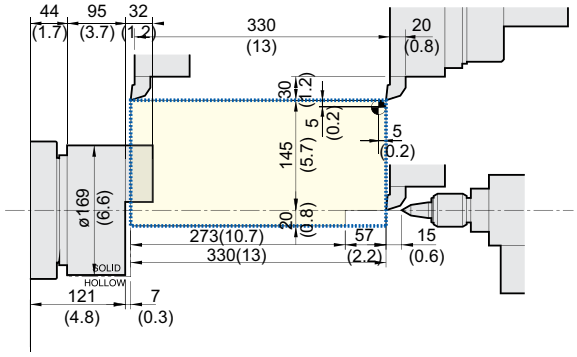
Tooling Travel Range

unit : mm(in)

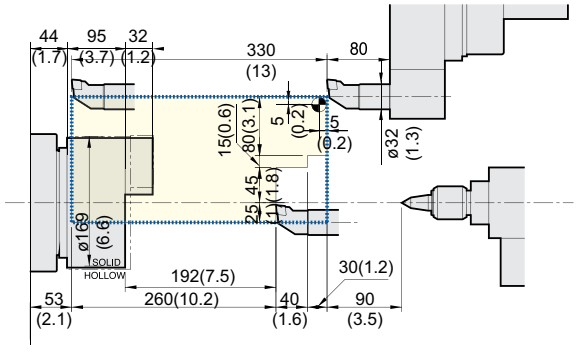
With Tail Stock Without Tail Stock

E160A

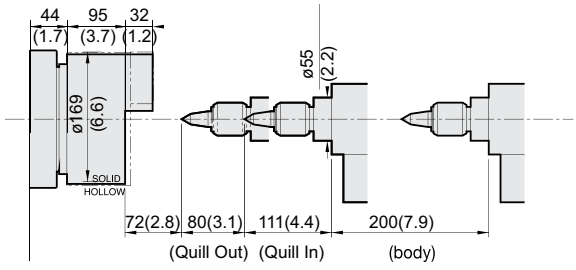
OD tool



ID tool

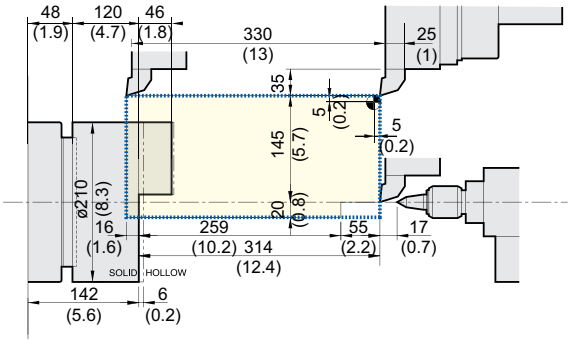


Tail stock (Opt.)

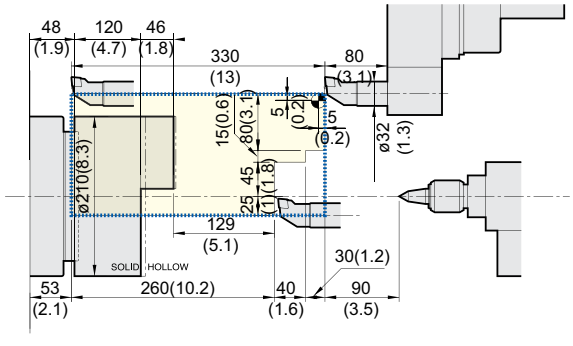


E160C

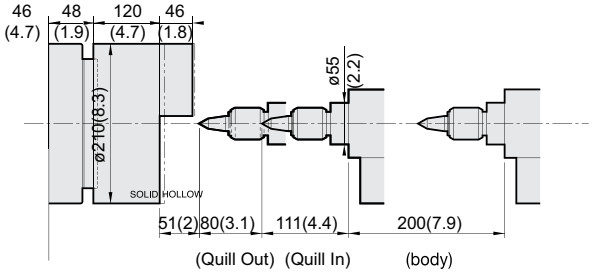
OD tool



ID tool



Tail stock (Opt.)



SPECIFICATIONS

Specifications

[ ] : Option

ITEM				E160A	E160C
CAPACITY	Swing Over the Bed		mm(in)	Ø480 (18.9″)	
	Swing Over the Carriage		mm(in)	Ø285 (11.2″)	
	Max. Turning Dia.		mm(in)	Ø280 (11″)	
	Max. Turning Length		mm(in)	300 (11.8″)	280 (11″)
	Bar Capacity		mm(in)	Ø45 (1.8″)	Ø51 (2″)
SPINDLE	Chuck Size		inch	6″	8″
	Spindle Bore		mm(in)	Ø55 (2.2″)	Ø62 (2.4″)
	Spindle Speed (rpm)		r/min	6,000	4,000 [4,000]
	Motor (Max/Cont.)		kW(HP)	11/7.5 (15/10)	11/7.5 (15/10) [15/11 (20/15)]
	Torque (Max/Cont.)		N·m(lbf·ft)	70/35.8 (51.6/26.4)	126/64.4 (92.9/47.5) [171.8/126 (126.7/92.9)]
	Spindle Type		-	BELT	
	Spindle Nose		-	A2-5	A2-6
	C-axis Indexing		deg	-	
FEED	Travel (X/Z)		mm(in)	165/330 (6.5″/13″)	
	Rapid Traverse Rate (X/Z)		m/min	30/30	
	Slide Type		-	LM GUIDE	
TURRET	No. of Tools		ea	12	10
	Tool Size	OD	mm(in)	□ 20 (0.8″)	□ 25 (1″)
		ID	mm(in)	Ø32 (1.2″)	
	Indexing Time		sec/step	0.1	
LIVE TOOL	Motor (Max/Cont.)		kW(HP)	-	
	Milling Tool Speed (rpm)		r/min	-	
	Torque (Max/Cont.)		N·m(lbf·ft)	-	
	Collet Size		mm(in)	-	
	Type		-	-	
TAIL STOCK	Taper		-	[MT4]	
	Quill Dia.		mm(in)	[Ø55 (2.2″)]	
	Quill Travel		mm(in)	[80]	
	Travel		mm(in)	[200 (3.1″)]	
TANK CAPACITY	Coolant Tank		ℓ (gal)	130 (34.3)	
	Lubricating Tank		ℓ (gal)	1.8 (0.5)	
POWER SUPPLY	Electric Power Supply		kVA	13	
	Thickness of Power Cable		mm^2	Over 16	
	Voltage		V/Hz	220/60 (200/50*)	
MACHINE	Floor Space (L×W)		mm(in)	1,940×1,660 (76.4″×65.4″)	
	Height		mm(in)	1,602 (63.1″)	
	Weight		kg(lb)	2,400 (5,291)	2,500 (5,511)
NC	Controller		-	HYUNDAI WIA FANUC i Series - Smart Plus	

*) Using 50Hz voltage instead of 60Hz may lower the output of motors. (excluding servo motors and inverter motors)

Specifications are subject to change without notice for improvement.

CONTROLLER

HYUNDAI WIA FANUC i Series – Smart Plus

[ ] : Option

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

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

Option	
Fast ethernet	Needed option board
Data server	Needed option board
Protection of data at 8 levels	
Tool offset pairs	200 pairs
Helical interpolation	
Look-ahead Block	40 ea, 200 ea (AICC Ⅱ)

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

HYUNDAI WIA

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