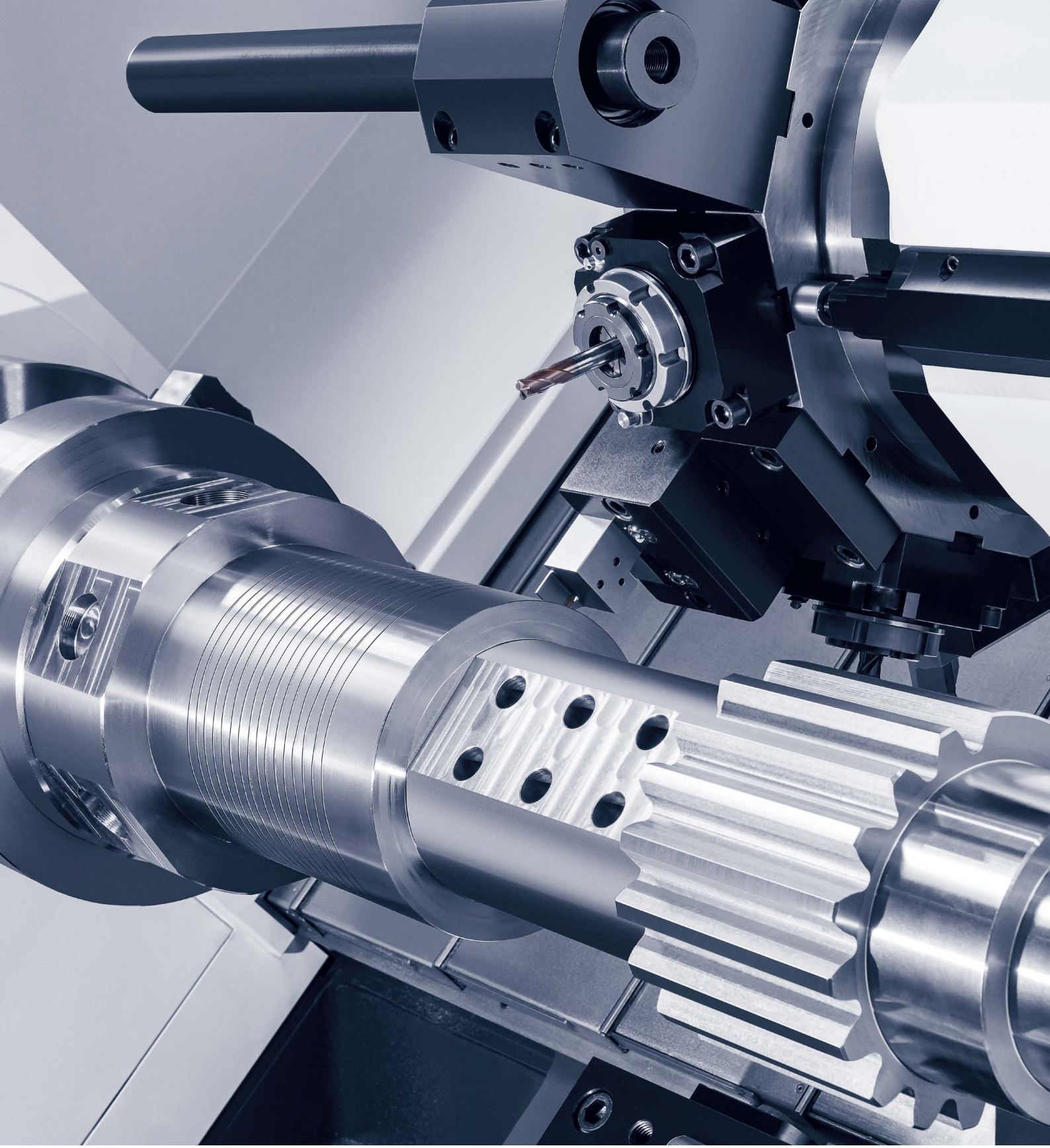


Hi-TECH 650

15″– 21″ Chucker
Horizontal Turning Center

HYUNDAI WIA

Product Overview

New exterior design sets off much greater productivity and durability

Hi-TECH 650 adopts a bed structure suitable for powerful cutting and the box-way method on all guide surfaces to maintain rigidity and precision even in long-term use. In addition, the gearbox applied as standard facilitates powerful cutting, and the Y-axis utilized combined machining significantly reduces the machining process time to provide high productivity.

Complex machining for medium-sized long shafts and cylinder type workpieces

1. High Performance Spindle : Max Torque A: 3,071Nm / B: 4,108Nm
2. Wide Disc Turret (OPT) : Enhancing Machining Performance by using Long Boring Bar
3. Powerful Milling Function :Max Torque : 95.5 Nm (OPT : 140 Nm)
4. Best-in-class Y-axis stroke : ±80 mm

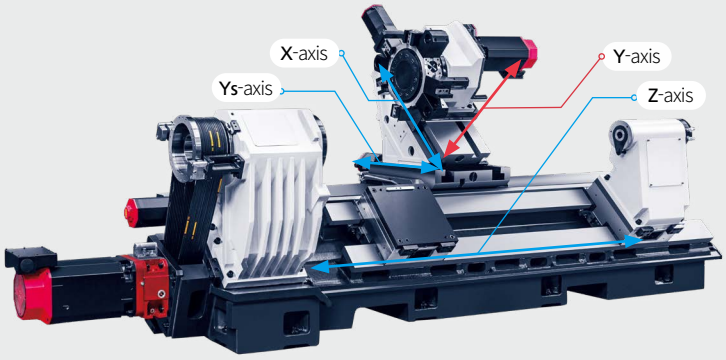
Durability-enhancing structure applied

1. Trapezoidal-Section Bed : Flat Bed Structure for Increased Rigidity and Stability
2. Triangular Saddle as Optimized Structure

Enhanced User Conveniences

1. Pocket for Long Boring Bar to Avoid interference between Cover and Tool
2. Helical interpolation mounted as standard

Basic Structure



"Increased structural rigidity"

via FEM analysis

"Enhanced precision"

through minimizing thermal deformation with a structure in which the machining area and feed drive system area are separated

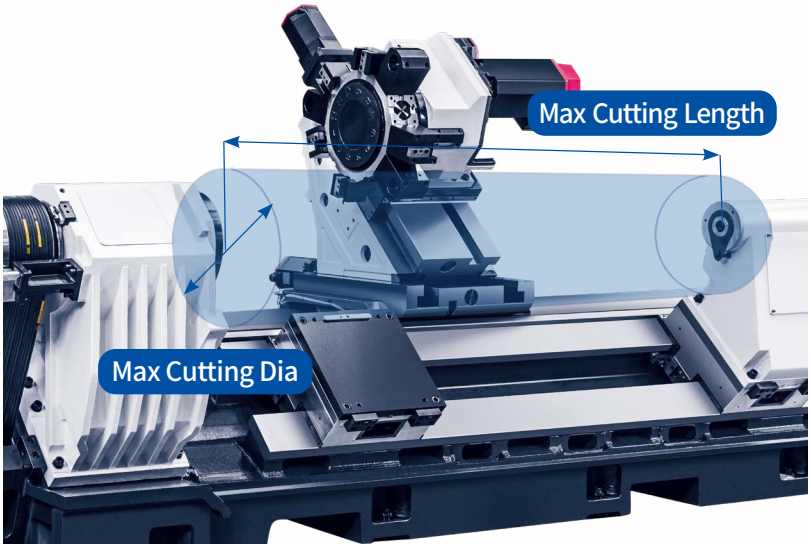
Type	Chuck Size inch	Max Stroke mm (inch)			Rapid Speed m/min (ipm)		
		X-axis	Z-axis	Y-axis	X-axis	Z-axis	Y-axis
Hi-TECH 650 A/AL/AXL	15 (OPT:18)	360 (14.17)	1,200 (47.24) L:2,200 (86.61) XL:3,300 (129.92)	±80(±3.14)	20 (787)	24 (944.9) L:20 (784.4) XL:10 (393.7)	10 (393.7)
Hi-TECH 650 B/BL/BXL	21						

* L : Long Bed / XL : Extra Long Bed

* Y-axis is YMC Type Only.

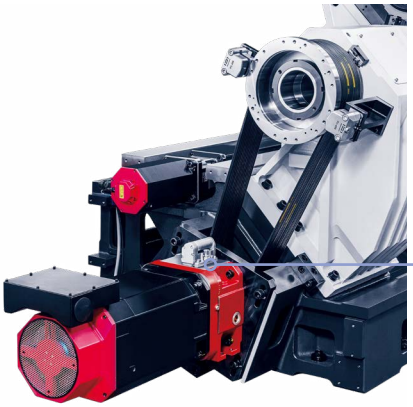
"Structure in which no interference occurs due to saddle feed within the maximum machining diameter"

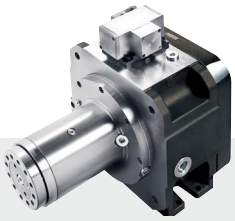
for easy operation



Type		Max Cutting Dia mm (inch)	Max Cutting Length mm (inch)
Hi-TECH 650 A/AL/AXL	STD	Ø600 (23.62)	1,108 (43.62) / L:2,108 (82.99) / XL:3,208 (126.2)
	MC / YMC		1,069 (42.08) / L:2,069 (81.45) / XL:3,169 (124.76)
Hi-TECH 650 B/BL/BXL	STD		1,039 (40.9) / L:2,039 (80.27) / XL:3,139 (123.5)
	MC / YMC		1,000 (39.37) / L:2,000 (78.74) / XL:3,000 (122.04)

Main Spindle





"Powerful Spindle with Gear Box (STD)"

Power is delivered to the spindle through two speed transmission allowing high spindle speed as well as powerful high torque.

Powerful chucking and high-speed machining

"Enhanced Cutting Performance and Productivity"

Max Spindle Speed 2,000 rpm

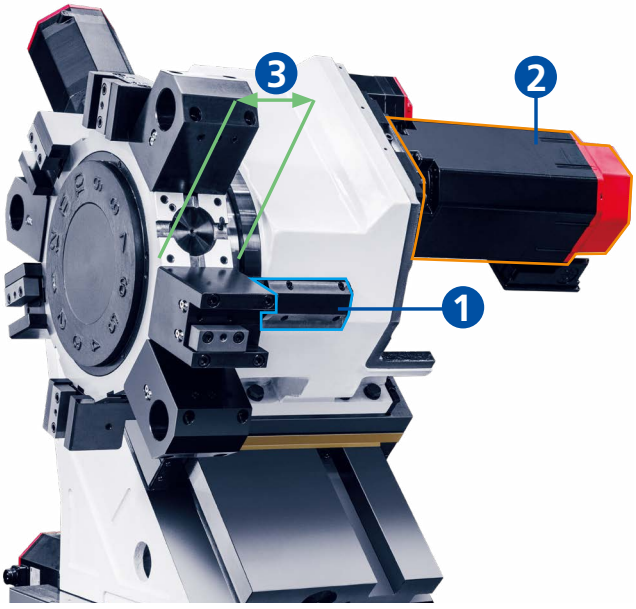
Spindle Motor 37kW

Meeting the customer's machining purposes

"Various Specifications Spindles"

Type	Max Spindle Speed rpm	Spindle Motor kW (HP)	Spindle Torque Nm	Max Bar Size mm (inch)	Type of Spindle Nose ASA
Hi-TECH 650A	2,000	37/30 (50 / 40)	3,071	Ø117 (4.61)	A2-11
Hi-TECH 650B	1,500	45/37 (60 / 50)	4,108	Ø165 (6.5)	A2-15

Turret



"Reduced vibration and noise by improved internal structure Curvicclamp force increased 48%"

1. External coolant passage prevents leakage into inside of turret
2. High torque turnmillmotor
   - Max Torque : 95.5 Nm (OPT : 140 Nm)
3. (Y)MC Turret – BMT 75(STD)
   - Disc Width(OPT) : 200mm (7.87inch)
   - Long Boring Bar Applicable

Type	Number of Tool Stations ea	Tool Size mm (inch)	Turret Indexing Time sec/step	Max Speed of Rotating Tool rpm
STD	12	O.D : □32 (1.25) I.D : Ø60 (2.36)	Index : 1.8 Rotation : 0.5	-
MC / YMC				4,000(OPT : 3,000)

Standard / Optional Accessories Status

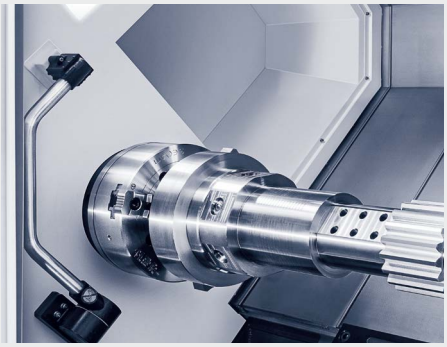
S : Standard O : Option X : Not available

NO.	Item	Description	Hi-TECH 650 A / AL / AXL			Hi-TECH 650 B / BL / BXL		
			STD	MC	YMC	STD	MC	YMC
1	Chuck	15 inch	S	S	S	X	X	X
2		18 inch	O	O	O	X	X	X
3		21 inch	X	X	X	S	S	S
4	Jaw	Soft Jaw	S	S	S	S	S	S
5		Hard Jaw	O	O	O	O	O	O
6	Chucking	Chucking Pressure Check Switch	O	O	O	O	O	O
7		Dual Pressure (Chuck)	O	O	O	O	O	O
8		Dual Pressure (C-axis brake)	X	S	S	X	S	S
9		Chuck Pressure Compensation	O	O	O	O	O	O
10		Chuck Clamp / Unclamp Switch	O	O	O	O	O	O
11	Turret	Standard (12 Station turret with Turning Tool only)	S	X	X	S	X	X
12		BMT75 Turnmill (12 Station turret with Turnmill)	X	S	S	X	S	S
13		Straight Turnmill Holder (BMT75)	X	O	O	X	O	O
14		Angular Turnmill Holder (BMT75)	X	O	O	X	O	O
15		U-Drill Holder	O	O	O	O	O	O
16	Tailstock	Body & Quill Programmable Tailstock	S	S	S	S	S	S
17	Coolant Pump	0.6 MPa	S	S	S	S	S	S
18		1.5 / 3 / 7 MPa *For 7 MPa, only water soluble coolants are available	O	O	O	O	O	O
19	Coolant Options	Coolant Gun	O	O	O	O	O	O
20		Coolant Blow	O	O	O	O	O	O
21		Coolant Chiller	O	O	O	O	O	O
22		Oil Skimmer	O	O	O	O	O	O
23	Steady Rest	Base for Steady Rest	O	O	O	O	O	O
24		Steady Rest	O	O	O	O	O	O
25	Chip Disposal	Side Type Chip Conveyor (Hinge Type)	O	O	O	O	O	O
26		Air Blow	O	O	O	O	O	O
27	Automation	Tool Presetter (Automation)	O	O	O	O	O	O
28		Tool / Work Counter (Internal / External)	O	O	O	O	O	O
29	NC Function	Arbitrary Speed Threading	O	O	O	O	O	O
30		Tool Life Management	S	S	S	S	S	S
31		Automatic Tool Offset (Tool Presetter option is required)	S	S	S	S	S	S
32		Manual Guide i	S	S	S	S	S	S
33		15" Non touch display	S	S	S	S	S	S
34		15" Touch type display	O	O	O	O	O	O
35	Software	Lathe Tool Load Detect (L-HTLD)	S	S	S	S	S	S
37		Lathe Calculator Function (L-CAL)	S	S	S	S	S	S
38		Lathe Work / Tool Management (L-COUNT)	S	S	S	S	S	S
39		Lathe Workpiece Clamp of Chuck (L-WCMP)	O	O	O	O	O	O
40		Monitoring Solution of Real-time Operational Status (M-VISION Pro)	O	O	O	O	O	O
41		Hwacheon Lathe Vibration Control System (HLVC)	S	S	S	S	S	S
42		M-Code & G-Code List Help	S	S	S	S	S	S
43	ETC	Linear Scale (X / Z / Y)	O	O	O	O	O	O
44		NC Cooler	O	O	O	O	O	O
45		Signal Lamp with 3 Color (R / G / Y)	S	S	S	S	S	S
46		Transformer	O	O	O	O	O	O

Tool Presetter (OPT)

Available functions with automatic tool presetter

- With a simple touch on the sensor, it perfectly sets the coordinate system (within 15 seconds per tool).
- The tool shape error value is automatically calculated and entered.
- The automatic coordinate system is promptly configured according to the material geometry



Coolant System

External Coolant Tank (STD)

A coolant tank is placed at the front of the machine for easy coolant exchange as well as easy tank cleaning and pump maintenance.

Chip Filter (STD)

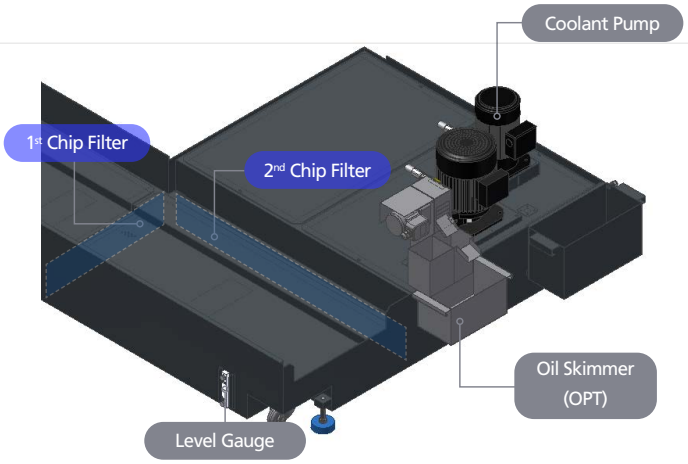
A 2 stage filter system, which is able to screen from longchips to micro chips, extends the service life of the coolant pump.

Various Options

- Standard Coolant Pump : 0.6 MPa
- Optional Coolant Pump : 1.5 / 3 / 7 MPa
  *For 7 MPa, only water soluble coolants are available
- Oil Skimmer (OPT)
- Lift-up Chip Conveyor : Hinge Type (OPT)

Tank Capacity

- Short Type : 250 ℓ (66 gal)
- Long Type : 300 ℓ (79 gal)
- Extra Long Type : 370 ℓ (98 gal)



Can increase the chip outlet height to use a large chip cart and easily process large amounts of chips

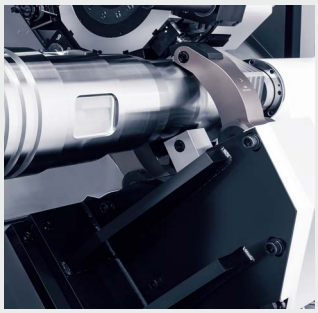
Convenient Operator Panel

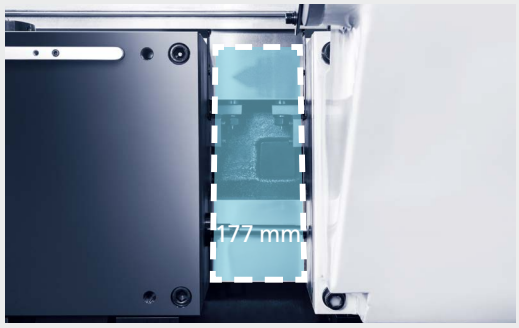
Rotary control panel

The operator panel is newly designed from the operator's viewpoint and thus enhances the operator's convenience

"User Friendly Design"

- 15" display as standard (Non-touch Type Display)
  QWERTY Key MDI
- Part Program Storage Length : 2MB
  Number of Register Able Programs : Max 1,000ea
- Enhanced operability by optimizing the layout and improving the touch feeling of control buttons.
- Long time continuous DNC operation with the CF card even without the data server.





Steady Rest & Steady Rest Base (OPT)

Variety of optional devices including the base are prepared for various steady rest applications

- Hy'd Line with valves for open & close
- Lubrication line
- Interlock cable between block and tailstock
- Electric signal cable for open & close

Operation Method

- Programmable Type

Minimizes the space between the vibration dampener and the tail stock to improve machining efficiency of long materials

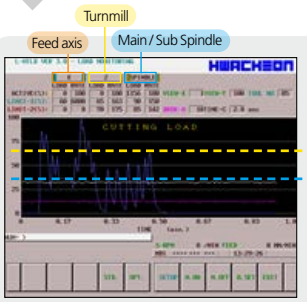
Linear Scale (OPT)

Realizes precise machining without need for preheating

- Improves equipment availability
- Maintains uniform backlash
- Improves precision of positioning accuracy

Hwacheon Software

Lathe Hwacheon Tool Load Detect System (STD)



It monitors the load factors of spindles and each axis during lathe (turnmill) machining and provides the following benefits to customers.

1. Tool life management

Generates an alarm for excessive insert wear (overload)

2. Optimized process

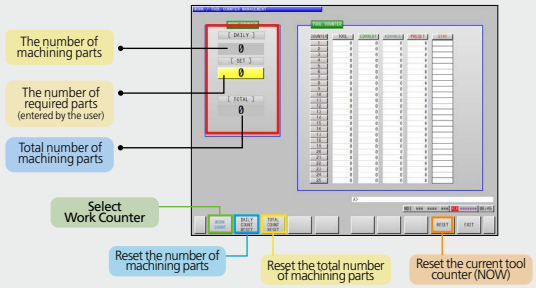
Able to control individual machining conditions per insert wear

3. Able to quickly respond to wear and damage of tools

Generates a replacement alarm in the event of an insert damage

Lathe Work / Tool Counter Management (STD)

You can monitor the daily / total production quantity and tool usages.



Tool Count Management : 25 tools

- Counter number display (COUNTER)
- Select tool number (TOOL)
- Display current tool counter (CURRENT)
- TOOL replacement forecast through message (ADVANCE)
- Tool replacement notification through alarm (PRESET)
- Display current tool counter status (STAT)

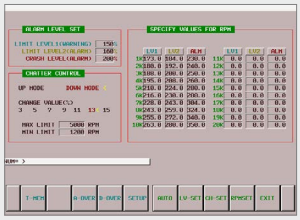
Lathe Calculator Function (STD)

You can enter values required for machining directly from the display operator panel for an easy calculation without a calculator.

- The number of optimal main spindle speed
- The cutting speed
- Material removal rate (MRR)
- The cutting time

Lathe Vibration Control System (STD)

It is possible to monitor the vibrations, and to remove chattering during the machining process in real-time.



- Real-time vibration monitoring
- Check for Chatter Occurrence
- Alarm on Chatter Found
- Automatic reduction control in chatter

Monitoring Solution of Real-time Operational Status Plus/Pro (OPT)

Real-time operational status monitoring system for the User's factory machine management.

M-VISION Plus

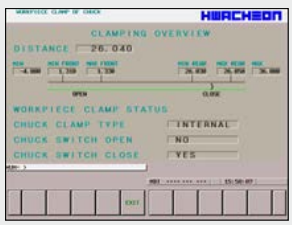
- Monitoring of real-time operational status
- Mobile app supported
- Machining history saving, retrieving and statistics
- Statistics on operational efficiency and history by equipment

M-VISION Pro

- Real-time machine operation status monitoring
- Mobile app supported
- Saving machining/alarm history, retrieving and statistics
- Statistics on operational efficiency and history by equipment/by equipment in total , operator, and arbitrary set period
- Machining Management

Lathe Workpiece Clamp of Chuck (OPT)

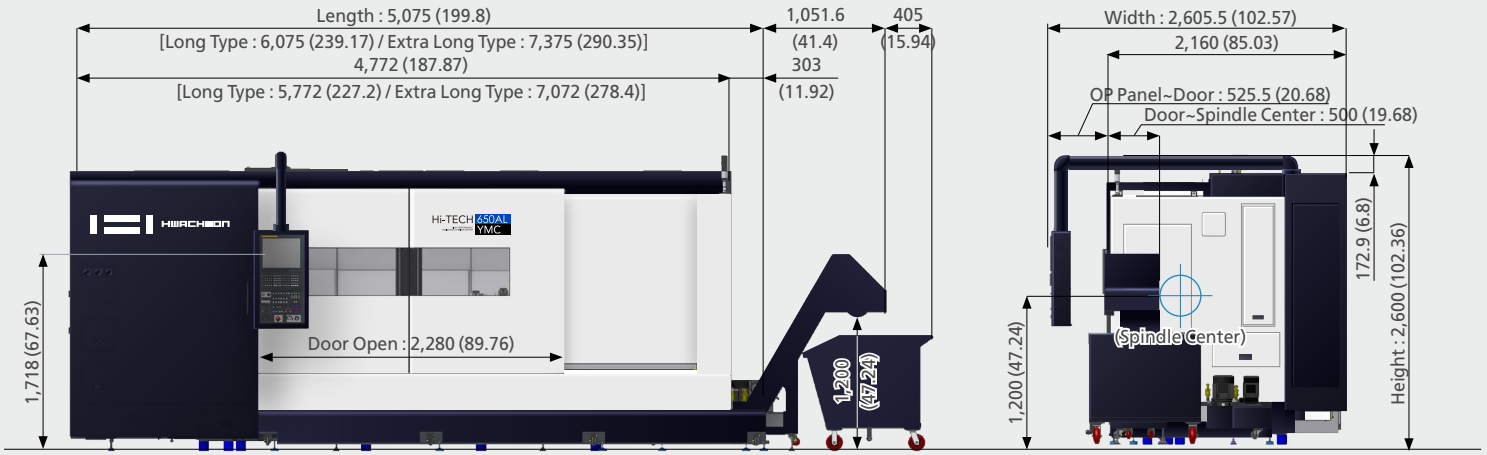
To complement the drawback of the proximity switch of which the position should be adjusted according to the material diameter, the analog sensor (0-10V) is used to set the distances of the open and close zones from the operating screen for enhanced user convenience.
(However, it is necessary to discuss with factory in advance whether it is possible to mount the analog sensor.)



- View the chuck open / close state
- Change the driving condition according to the chuck type (inner and outer diameters)
- Set the chuck open / close zone
- An alarm is generated if the chuck function fails

Machine Size

* Unit : mm (inch)

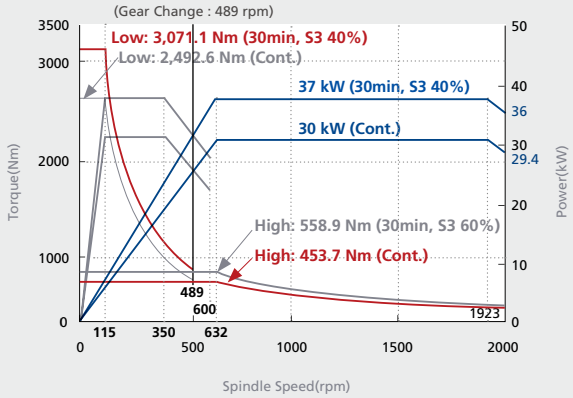


Front Side

Spindle Power – Torque Diagram

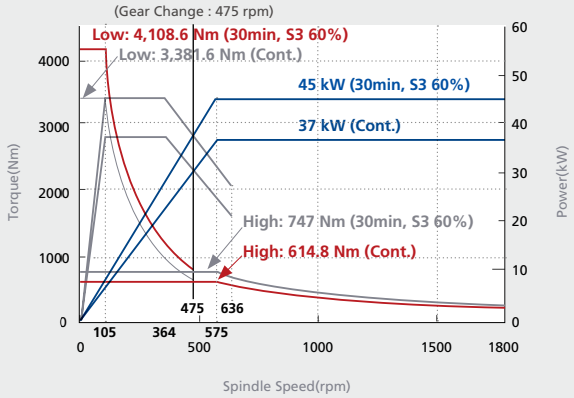
2,000 rpm (Hi-TECH 650A)

Max Power : 37 kW / Max Torque : 3,071.1 Nm



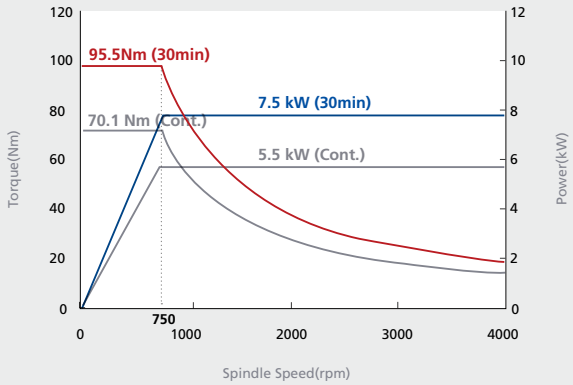
1,500 rpm (Hi-TECH 650B)

Max Power : 45 kW / Max Torque : 4,108.6 Nm



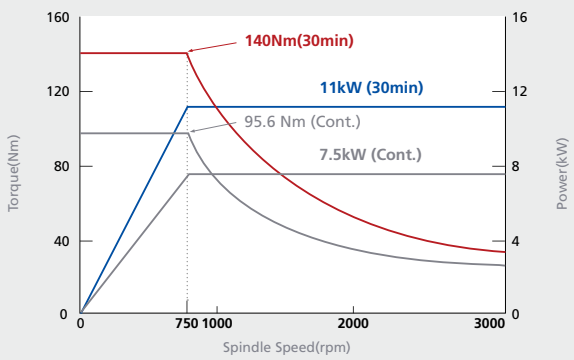
4,000 rpm (Turnmill) (OPT1)

Max Power : 7.5 kW / Max Torque : 95.5 Nm



3,000 rpm (Turnmill) (OPT2)

Max Power : 11 kW / Max Torque : 140 Nm



Product Configuration

Ref

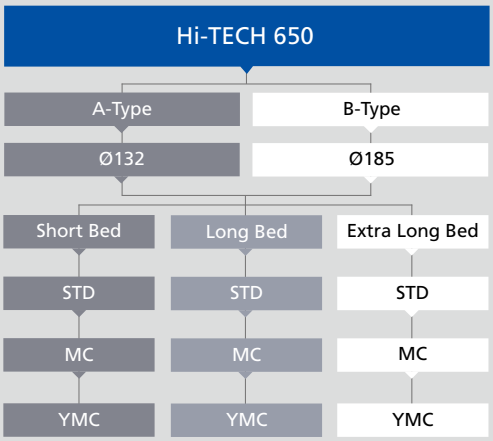
· STD : Standard
· MC : Turnmill
[C-axis (0.0001°)]
· YMC : Turnmill
[C-axis (0.0001°)]
+ Y-axis
· L : Long Bed
· XL : Extra Long Bed

Hi-TECH
650A
650AMC
650AYMC

650AL
650ALMC
650ALYMC

650AXL
650AXLMC
650AXLYMC

Through Spindle Hole Dia (mm)



Hi-TECH
650B
650BMC
650BYMC

650BL
650BLMC
650BLYMC

650BXL
650BXLMC
650BXLYMC

Machine Specifications

Item		Hi-TECH 650A			Hi-TECH 650B		
		STD	MC	YMC	STD	MC	YMC
Capacity							
Swing over Bed	mm (inch)	Ø940 (38.37)					
Max Cutting Dia	mm (inch)	Ø600 (25.31)					
Standard Cutting Dia	mm (inch)	Ø274.7 (10.81)					
Max Cutting Length	mm (inch)	1,108 (43.62) L:2,108 (82.99) XL:3,208 (126.2)	1,069 (42.08) L:2,069 (81.45) XL:3,169 (124.76)		1,039 (40.90) L:2,039 (80.27) XL:3,139 (123.5)	1,000 (39.37) L:2,000 (78.74) XL:3,000 (122.04)	
Chuck Size	inch	15 (OPT : 18)			21		
Spindle							
Type of Spindle Nose	ASA	A2-11			A2-15		
Max Spindle Speed	rpm	2,000			1,500		
Through Spindle Hole Dia	mm (inch)	Ø132 (5.19)			Ø185 (7.28)		
Max Bar Size	mm (inch)	Ø117 (4.61)			Ø165 (6.5)		
Spindle Bearing Inner Dia	deg	Ø180 (7.09)			Ø240 (9.45)		
Spindle Motor	kW (HP)	37 / 30 (50 / 40)			45 / 37 (60 / 50)		
Spindle Torque	Nm	3,071			4,108		
Turret							
Number of Tool Stations	ea	12					
Tool Size	mm (inch)	O.D : □32 (1.25) / I.D : Ø60 (2.36)					
Turret Indexing Time	sec/step	Index : 1.8 / Rotation : 0.5					
Axes							
Rapid Traverse (X / Z / Y)	m/min (ipm)	20 / 24 / - (784.4 / 944.9 / -) L:20 / 20 / - (784.4 / 784.4 / -) XL:20 / 10 / - (784.4 / 393.7 / -)		20 / 24 / 10 (784.4/944.9/393.7) L:20 / 10 / 10 (784.4/393.7/393.7) XL:20 / 10 / 10 (784.4/393.7/393.7)	20 / 24 / - (784.4 / 944.9 / -) L:20 / 20 / - (784.4 / 784.4 / -) XL:20 / 10 / - (784.4 / 393.7 / -)		20 / 24 / 10 (784.4/944.9/393.7) L:20 / 10 / 10 (784.4/393.7/393.7) XL:20 / 10 / 10 (784.4/393.7/393.7)
Max Stroke (X / Z / Y)	mm (inch)	360 / 1,200 / - (16.9 / 92.5 / -) L:360 / 2,200 / - (16.9 / 131.9 / -) XL:360 / 3,300 / - (16.9 / 171.3 / -)		360 / 1,200 / ±80 (16.9 / 92.5 / ±3.94) L:360 / 2,200 /±80 (16.9 / 131.9 / ±3.94) XL:360 / 3,300 / ±80 (16.9 / 171.3 / ±3.94)	360 / 1,200 / - (16.9 / 92.5 / -) L:360 / 2,200 / - (16.9 / 131.9 / -) XL:360 / 3,300 / - (16.9 / 171.3 / -)		360 / 1,200 / ±80 (16.9 / 92.5 / ±3.94) L:360 / 2,200 /±80 (16.9 / 131.9 / ±3.94) XL:360 / 3,300 / ±80 (16.9 / 171.3 / ±3.94)
Feed Motor (X / Z / Y)	kW (HP)	4 / 7 / - (5.4 / 9.4 / -)		4 / 7 / 4 (5.4 / 9.5 / 5.4)	4 / 7 / - (5.4 / 9.4 / -)		4 / 7 / 4 (5.4 / 9.5 / 5.4)
Tailstock							
Cylinder Diameter	mm (inch)	Ø120 (4.72)					
Quill Stroke	mm (inch)	150 (5.91)					
Center Taper	MT	#5					
Turnmill							
Spindle Motor	kW (HP)	7.5 / 5.5 (OPT: 11 / 7.5)					
Max Spindle Speed	rpm	4,000 (OPT: 3,000)					
Min Index Angle	deg	0.0001					
Max Drill / Tap Size	mm(inch)	Ø26 (1.02) / ER 40					
Interface	-	BMT 75					
Tank							
Lubrication / Hydraulic	ℓ (gal)	12 / 50 (3.17 / 13.21)					
Coolant	ℓ (gal)	250 / L:300 / XL:370 (66 / L:79 / XL:98)					
Power Sources							
Electrical Power Supply	kVA	75					
Dimension							
Height	mm (inch)	2,600 (102.36)					
Floor Space (LxW)	mm (inch)	6,130 (241.3) [L: 7,130 (280.7), XL: 8,430 (331.8)] x 2,160 (85.03)					
Weight	kg_f (lb_f)	10,900 (24,030) L:13,100 (28,880) XL:16,400 (36,155)	11,400 (25,132) L:13,600 (29,982) XL:16,900 (37,258)	12,000 (26,455) L:14,200 (31,305) XL:17,500 (38,580)	11,400 (25,132) L:13,600 (29,982) XL:16,900 (37,258)	11,900 (26,235) L:14,100 (31,085) XL:17,400 (38,360)	12,500 (27,557) L:14,700 (32,407) XL:18,000 (39,683)
NC Controller		Fanuc 0i-TF Plus					

NC Specifications [Fanuc 0i-TF Plus]

※ — : Not available S : Standard O : Option

Item	Specification	STD	MC	YMC
Controlled Axis				
Controlled Axis (Cs Axis)	2 - Axes	2-Axes	3-Axes	4-Axes
Simultaneously Controlled Axes	2 - Axes	2-Axes	3-Axes	4-Axes
Least Input Increment	0.001 mm, 0.0001 deg, 0.0001 inch	S	S	S
Least Input Increment 1 / 10	0.0001 mm, 0.00001 inch	O	O	O
Inch / Metric Conversion	G20, G21	S	S	S
Store Stroke Check 1		S	S	S
Store Stroke Check 2, 3		S	S	S
Chamfering on / off		S	S	S
Backlash Compensation		S	S	S
Operation				
Automatic & MDI Operation		S	S	S
Program Number Search		S	S	S
Sequence Number Search		S	S	S
Dry Run, Single Block		S	S	S
Manual Handle Feed	1Unit	S	S	S
Manual Handle Feed Rate	x1, x10, x100	S	S	S
Interpolation Function				
Positioning	G00	S	S	S
Linear Interpolation	G01	S	S	S
Circular Interpolation	G02,G03	S	S	S
Dwell (Per Seconds)	G04	S	S	S
Polar Coordinate Interpolation	G12.1 / G13.1	-	S	S
Cylindrical Interpolation	G7.1	-	S	S
Threading	G32	S	S	S
Multiple Threading		S	S	S
Continuous Threading		S	S	S
Helical interpolation		-	S	S
Threading Retract		S	S	S
Variable Lead Threading	G34	S	S	S
Ref Position Return 1st	G28	S	S	S
Ref Position Return Check	G27	S	S	S
2 / 3 / 4th Ref Position Return	G30	S	S	S
Arbitrary Speed Threading		O	O	O
Feed Function				
Rapid Traverse Override	F0, F25, F50, F100	S	S	S
Feed Per Minute (mm/min)	G98	S	S	S
Feed Per Revolution (mm/rev)	G99	S	S	S
Rapid Traverse Bell-shaped Acceleration / Deceleration		S	S	S
Feedrate Override	0 ~ 150%	S	S	S
Jog Feed Override	0 ~ 1,260 mm/min	S	S	S
Program Input				
Tape Code	EIA / ISO	S	S	S
Optional Block Skip	9 ea	S	S	S
Program Number	O4-digits(1–9999)	S	S	S
Sequence Number	N8 - Digits	S	S	S
Decimal Point Programming		S	S	S
Coordinate System Setting	G50	S	S	S
Coordinate System Shift		S	S	S
Workpiece Coordinate System (G52 ~ G59)		S	S	S
Workpiece Coordinate System Preset (G92.1)		S	S	S
Direct Drawing Dimension Programming		S	S	S

Item	Specification	STD	MC	YMC
Program Input				
G Code System	A	S	S	S
Programmable Data Input	G10	S	S	S
Sub Program Call	10 folds nested	S	S	S
Custom Macro B		S	S	S
Addition of Custom Macro -common Variables	#100 ~ #199, #500 ~ #999	S	S	S
Canned Cycles		S	S	S
Multiple Repetitive Cycle		S	S	S
Multiple Repetitive Cycle II		S	S	S
Canned Cycles for Drilling		S	S	S
Manual Guide i		S	S	S
Spindle Speed Function				
Constant Surface Speed Control	G96 / G97	S	S	S
Spindle Override	0 ~ 150%	S	S	S
Spindle Orientation		S	S	S
Rigid Tapping		S	S	S
Spindle Synchronous Control		-	-	-
Tool Function / Compensation				
Tool Function	T4-digits	S	S	S
Tool Offset Pairs	128 pairs	S	S	S
Tool Nose Radius Compensation		S	S	S
Tool Geometry / Wear Compensation		S	S	S
Tool Life Management		S	S	S
Automatic Tool Offset	Tool presetter option is required	S	S	S
Direct Input Tool Offset Value Measured B		S	S	S
Editing Operation				
Part Program Storage Length	5,120 m (2MB)	S	S	S
Number of Register Able Programs	Max.1000 ea	S	S	S
Background Editing		S	S	S
Extended Part Program Editing		S	S	S
Play Back		S	S	S
Operation / Display				
Clock Function		S	S	S
Self-diagnosis Function		S	S	S
Alarm History Display		S	S	S
Help Function		S	S	S
Run Hour and Parts Count Display		S	S	S
Graphic Function		S	S	S
Multi-language Display	Korean, English, German, French, Italian, Chinese, Spanish, Portuguese, Polish, Hungarian, Swedish, Russian	S	S	S
Data Input / Output				
Ethernet Interface		S	S	S
Memory Card Interface		S	S	S
USB Card Interface		S	S	S
Others				
Display Unit	15" Non touch display	S	S	S
Fanuc i-HMI	15" Touch type display	O	O	O
Others				
L-HTLD (Hwacheon Tool Load Detect System)		S	S	S
L-CAL (Lathe Calculator Function)		S	S	S
L-COUNT (Work / Tool Counter Management)		S	S	S
HLVC (Hwacheon Lathe Vibration Control)		S	S	S
M-VISION Pro		O	O	O

Hwacheon Global Network

Hwacheon Headquarters Hwacheon Europe Hwacheon Asia Hwacheon America

HWACHEON

Please contact us for product inquiries.

www.hwacheon.com

The product design and specifications may change without prior notice.
Read the operation manual carefully and thoroughly before operating the product,
and always follow the safety instructions and warnings labels attached on the surfaces of the machines.

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