HiREX-4000

High Efficiency Travelling Column Machining Center

HWACHEON

HIGH EFFICIENCY TRAVELLING COLUMN MACHINING CENTER

High-Rigidity, High-Efficiency Travelling Column Machining Center

HiREX-4000, with long tables on both sides, is optimized for machining various components. It can perform machining of a long material using its long table and perform multiple machining using jig & fixture, and partitions, achieving the production efficiency of two machines with one machine. This new travelling column machining center can perform tool change in the entire X-axis range.

1 ATC   2 Column (C-Type Structure)   3 Chip conveyor (Opt.)   4 Water chiller (Opt.) & Oil mist (Opt.)

PRECISION HEAVY-DUTY MACHINING

Powerful Cutting and Precision Machining

HiREX-4000, a travelling column machining center, guarantees the quality of industrial components that require precision machining, including the parts for home appliances, semiconductors, automobiles, airplanes and pipes.

Powerful main spindle directly coupled with the motor, fast travelling using roller LM guide, and adoption of X-axis linear scale ensure stable machining performance.
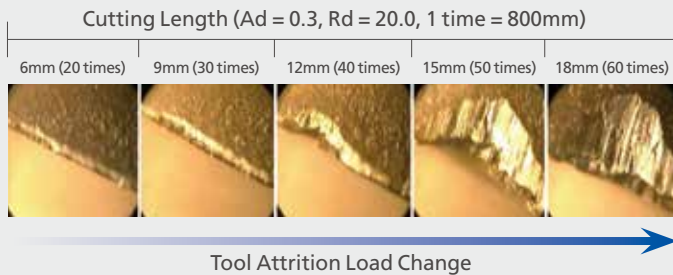
Also, the solid, stable C-type structure designed using 3D and FEM analysis improves the machining quality of the components.

The Hwacheon's proprietary machining software is embedded in the machine to maximize the machining efficiency. Also, various convenience features were added to the machine to enhance user convenience.

Hwacheon Tool Load Detect

HTLD™
Hwacheon
Tool Load Detect

Cutting Length (Ad = 0.3, Rd = 20.0, 1 time = 800mm)

| 6mm (20 times) | 9mm (30 times) | 12mm (40 times) | 15mm (50 times) | 18mm (60 times) |

Tool Attrition Load Change

High-Rigid C-type Machine Structure

FEM structural analysis was used to optimize the machine structure and minimize deformation due to machining condition and environment. The stable machine structure provides high durability and strong cutting ability, ensuring superior performance.
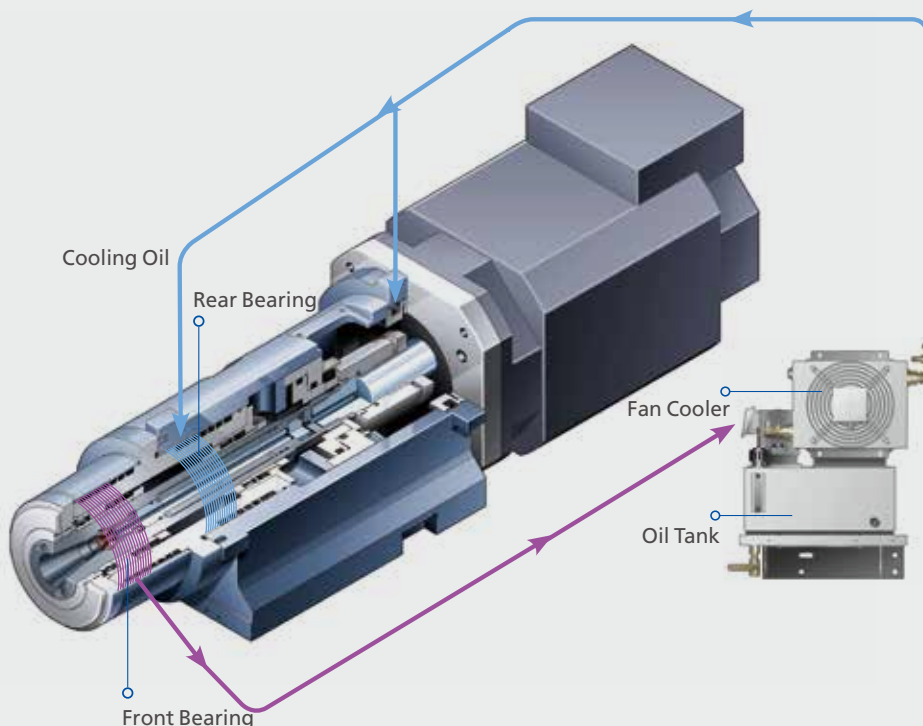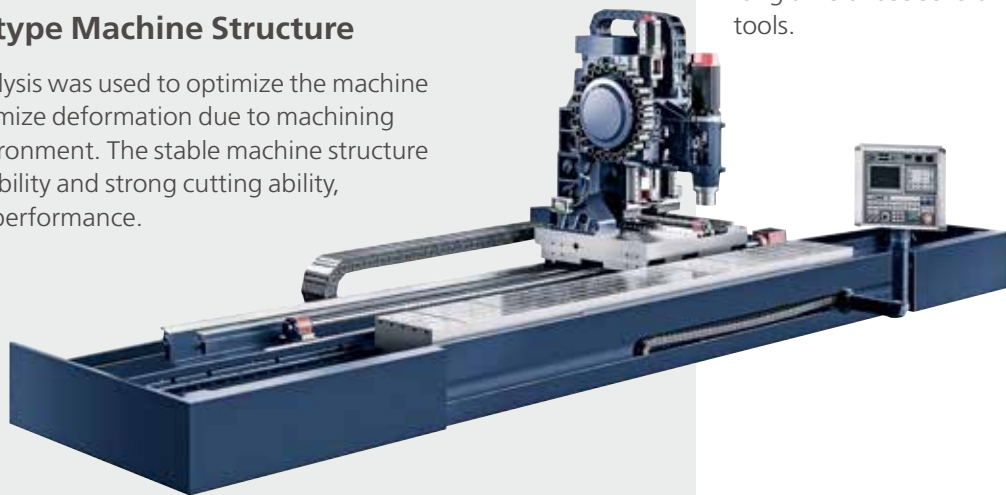
Hwacheon Tool Load Detect (HTLD)

This feature can prevent the situation where a faulty component is produced due to tool wear or damage during machining process.
To prevent tool wear or damage during machining process, it detects fine movement of the tool and the tool load in real time and diagnoses the machine using the information. This is useful when you use the machine for a long time or use several identical tools.

Cooling Oil

Rear Bearing

Fan Cooler

Oil Tank

Front Bearing

Powerful Main Spindle

The powerful main spindle is coupled with the motor directly, realizing stable high-speed machining. Also, the grease lubrication and jacket circulation cooling minimize thermal deformation.

Main Spindle Cooling Method

Coolant circulates around the frame supporting the motor and the housing supporting the bearings to cool them off.

Automatic Tool Changer

Tool Storage Capacity : 24ea
Max. Tool Length : 300mm
Max. Tool Weight : 8kgf
Tool Change Type : Swing Arm
Method of Tool Selection : Memory Random

Travelling Column Machining Center

It is a high-efficiency machining center with a long working table that can perform unattended machining of various components including a long workpiece. Its travelling column with integrated ATC drastically reduces specific cutting time.

High-Precision, High-Performance Feed System

Y and Z axes are coupled with the servo motor directly without an intermediate power converting device, minimizing the backlash when moving the spindle. Four-row combination bearings are used in all support axes including X, Y, and Z. Eight bearings support each axis, increasing the rigidity and the lifespan of the bearings.

Roller LM Guide & Linear Scale (Std.)

High-performance, best-in-its-class guide is used on all axes, ensuring stable axis movement when performing fast feed and heavy duty cutting. It also drastically improves the wear resistance compared to the ball guide, achieving precision feed and increasing the lifespan of the machine. Also, linear scale is used on the X axis, minimizing the errors due to thermal deformation.

Work Convenience

The interference due to the machine movement is minimized within the user working radius, maximizing user convenience.

You can access all sections of the table without a separate foothold, making it easy to load or unload workpiece. You can use a hoist to load or unload even the largest possible workpiece that can be machined to and from the inside of the machine without the interference of the machine cover.

Door Open : 4,250mm

Partition

Partition (Opt.)

You can install a partition at the center of the table to split the machining area into two, improving the productivity. While machining the workpiece on the left table, you can set another workpiece on the right table, saving the production time. Also, a door interlock is attached to the center partition so that you can lock the door to perform stable machining.

User friendly Operation Panel

You can move the control panel in the direction of X axis, allowing you to use the panel at any position. The ergonomic control panel enhances user convenience and efficiency.

USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

User Convenience and Various Features

HiREX-4000 was designed in a user-friendly way to offer various convenience features. Various useful features are applied to the machine to increase user convenience.

These features help users to focus on machining, ensuring safe and efficient work environment. Hwacheon offers various optional features based on its expertise to improve machine performance. These features ensure more powerful, faster, and more precise machining.

Index Table (Opt.)

The machine has applied double pistons to achieve powerful clamping force and uses high-speed, high-precision dividing system to realize stable heavy duty cutting.
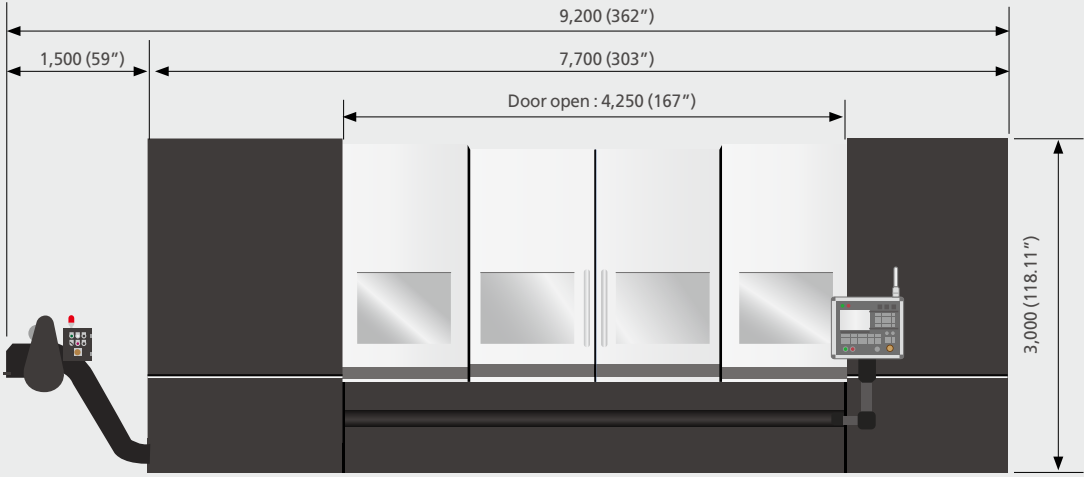
Measuring Device (Opt.)

The machine measures and compensates for the movement of the tool and workpiece automatically while machining, minimizing the specific cutting time and the time required to set the workpiece. Therefore, anyone can obtain the same results from repeated high precision machining regardless of their skills. Also, the machine detects any abnormalities of the tool and workpiece to prevent accidents proactively. The machine can be used in an automation line so that you can manage unattended production system efficiently.

Machine Size

* Unit: mm(inch)

9,200 (362")

1,500 (59")

7,700 (303")

Door open : 4,250 (167")

3,000 (118.11")

Front View

3,110 (122")

3,000 (118.11")
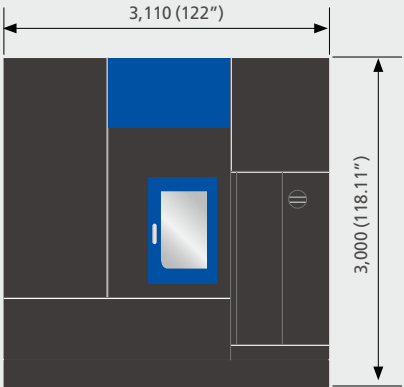
Right View

Spindle Power - Torque Diagram

Std. (10,000rpm)

95.5Nm(30min)

15kW(30min)

70Nm(Cont.)

11kW(Cont.)

Torque(Nm)

Power(kW)

Spindle Speed(rpm)
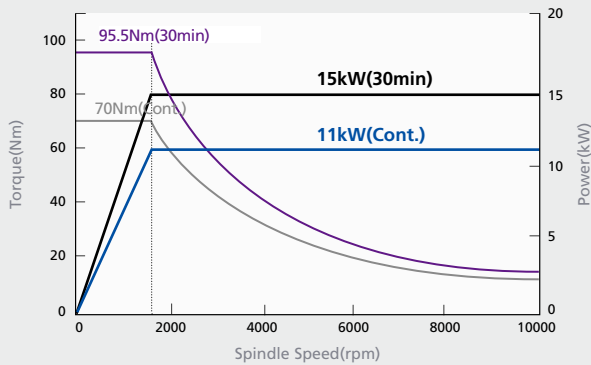
Product Configuration

Each product can be configured to fit your application

| HiREX-4000 |
| 10,000rpm |
| 15 / 11kW |
| FANUC Oi-MD | SIEMENS 828D |
| BT-40 (BBT-40) |
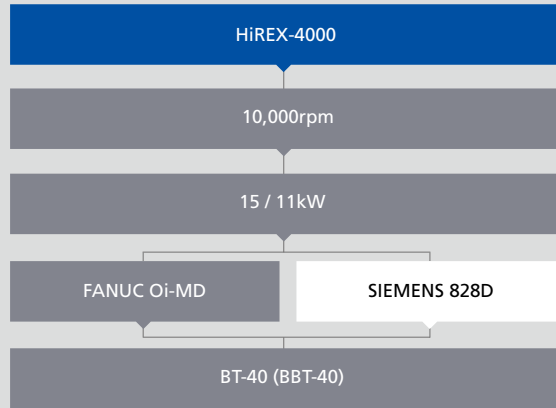
Machine Specifications

ITEM		HiREX-4000
Travel		
Stroke (X / Y / Z)	mm(inch)	4,000/520/570 (157.48/20.47/22.44)
Distance from table surface to spindle gauge line	mm(inch)	150 (5.91") ~ 720 (28.3")
Distance between column face to spindle center	mm(inch)	560 (22.05")
Table		
Working surface (Width x Length)	mm(inch)	550 (21.65") x 4,500 (177.17")
Table loading capacity	kg(lb)	4,300 (9,479.9)
Table surface configuration (T slots WxP – No. of slots)	mm(inch)	18 x 110 (0.71" x 4.33") - 5EA
Spindle		
Max. Spindle speed	rpm	10,000
Spindle motor	kW(HP)	15 / 11 (20 / 15)
Spindle taper	-	BT-40 / BBT-40 (7/24 Taper)
Spindle inner diameter	mm(inch)	Ø70 (2.76")
Method of spindle lubrication and cooling	-	Grease lubrication, Jacket cooling
Feedrate		
Rapid speed (X / Y / Z)	m/min(ipm)	30 (1,181) / 36 (1,417) / 36 (1,417)
Cutting feedrate (X / Y / Z)	mm/min(ipm)	1 ~ 10,000 (0.04 ~ 393.7)
ATC		
Type of tool shank	-	MAS-403 BT-40
Type of pull stud	-	MAS P40T-1 (45°)
Tool storage capacity	EA	24
Max. Tool diameter [with / without adjacent tools]	mm(inch)	Ø80 (3.15") / Ø150 (5.91")
Max. Tool length	mm(inch)	300 (11.81")
Max. Tool weight (including pull stud)	kg(lb)	8 (17.64)
Tool changing time (Tool to Tool)	sec	1.7
Motor		
Feed motor (X / Y / Z)	kW(HP)	4.0 (5.3) / 4.0 (5.3) / 4.0 (5.3)
Coolant motor (Spindle / Chip flushing)	kW(HP)	0.9 (1.2) / 0.9 (1.2)
Spindle cooling motor	kW(HP)	0.18 (0.24)
Power Source		
Electric power supply	kVA	30
Compressed air supply (Pressure x Consumption)	-	5 ~ 7kgf/cm² x 690Nl/min
Tank Capacity		
Spindle cooling / Lubrication	ℓ (gal)	15 (3.9) / 2 (0.5)
Coolant	ℓ (gal)	600 (158.5)
Machine Size		
Height (Z-axis top point)	mm(inch)	3,000 (118.11")
Floor space (Length × Width)	mm(inch)	7,700 (303") x 3,010 (118.5")
Weight	kg(lb)	20,500 (9,297)
NC controller		Fanuc 0i-MD

Accessories

Standard Accessories		Optional Accessories	
• Artificial intelligence control system	• Signal lamp (R / G / Y, 3color)	• Air blower	• Oil chiller
• Coolant equipment	• 10.4" LCD display	• Air dryer	• Oil mist (Semi dry cutting system)
• Door interlock		• Air gun	• Oil skimmer
• Ethernet interface		• Auto door (Air cylinder)	• Partition
• Full cover		• Automatic power off	• Rotary table
• Leveling block & plate		• Chip conveyor (Hinge / Scraper type)	• Side door
• Linear scale (X-axis)		• Coolant gun	• SIEMENS-828D
• Lubrication system		• Coolant through spindle (30bar)	• Linear scale (Y / Z)
• MPG handle (1ea)		• Data server	• Mist collector
• Operation manual & part List		• High pressure coolant pump (15bar)	• NC cooler
• Pneumatics system		• HTLD (Hwacheon Tool Load Detect system)	• Transformer (30kVA)
• Program capacity : 1,280M(512KB)		• Manual guide i	• 4th axis interface
• Rigid tapping		• MPG handle (3ea)	
• Spindle cooler (Fan cooler)		• Tool measuring system (Touch / Laser type) – Renishaw / Blum	
• Tool box		• Workpiece measuring system (Touch type) – Renishaw / Blum	
• Work light (LED)		• AI Contour control system I / AI Contour control system II (40block / 200block)	

NC Specifications [Fanuc 0i-MD]

- : Not Available S : Standard O : Option

ITEM	SPECIFICATION	
Controlled axis		
Controlled axis	5 - Axes	S
Simultaneously controlled axis	4 - Axes	S
Least input increment	0.001mm, 0.001deg, 0.0001inch	S
Least input increment 1/10	0.0001mm, 0.0001deg, 0.00001inch	O
Inch/metric conversion	G20, G21	S
Stored stroke check 1		S
Stored stroke check 2,3		S
Optional chamfering on/off		S
Backlash compensation		S
Operation		
Automatic & MDI operation		S
Program / Sequence number search		S
Single block, Dry run		S
Manual handle feed / Manual handle feedrate	1Unit / x1, x10, x100	S
Interpolation function		
Positioning / Linear / Circular interpolation / Dwell	G00 / G01 / G02,G03 / G04	S
Polar coordinate command	G15 / G16	S
Cylindrical interpolation	G7.1	O
Thread cutting	G32	-
Variable lead thread cutting		-
Variable lead thread cutting	G34	-
Reference position return / Reference position return check / 2nd Reference position return	G28 / G27 / G30	S
Feed function		
Rapid traverse override	F0, F25, F50, F100	S
Feed per minute (mm/min)	G94	S
Feed per revolution (mm/rev)	G95	S
Bell-shaped acc/dec		S
Feed override	0 ~ 200%	S
Jog feed rate	0 ~ 6,000mm/min	S
Program Input		
Tape code	EIA RS244 / ISO840	S
Optional block skip	9ea	S
Program number	O4 - digits	S
Sequence number	N5 - digits	S
Decimal point programming		S
Coordinate system setting	G92	S
Coordinate system shift		S
Work piece coordinate system	G52-G59	S
Work piece coordinate system preset		S
Direct drawing dimension programming		-
G Code system		-
Programmable data Input	G10	S
Sub program call		S

ITEM	SPECIFICATION	
Custom macro		S
Addition of custom macro variables	#100 - #199, #500 - #999	S
Plane selection	G17 / G18 / G19	S
Multiple repetitive cycle		-
Multiple repetitive cycle II		-
Canned cycles for drilling		S
Peck drilling cycle		S
Spindle speed function		
Constant surface speed control	G96 / G97	S
Spindle override	50 ~ 150%	S
Spindle orientation		S
Rigid tapping		S
Tool function / Tool compensation		
Tool function	T2 - digits	S
Tool offset pairs	400pairs	S
Tool nose radius compensation		S
Tool geometry / wear compensation		-
Tool life management		S
Automatic tool length measurement		S
Direct input of tool offset value measured B		-
Edit function		
Part program storage size	1,280m(512kb)	S
Number of register programs	400ea	S
Background edit		S
Extended part program editing		S
Play back		S
Clock function		S
Self-diagnosis function		S
Alarm history display		S
Help function		S
Run hour and parts count display		S
Graphic display function		S
Dynamic graphic display		O
Language display (English, Korean)		S
Data input / output		
Reader / puncher interface		S
Data server function		O
Memory card, USB input/output		S
Others		
Display unit	10.4" color LCD	S

Hwacheon Global Network

■ Hwacheon Headquarters   ■ Hwacheon USA   ■ Hwacheon Europe   ■ Hwacheon Asia

HWACHEON

Please contact us for product inquiries.

www.hwacheon.com

The product design and specifications may change without prior notice.

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