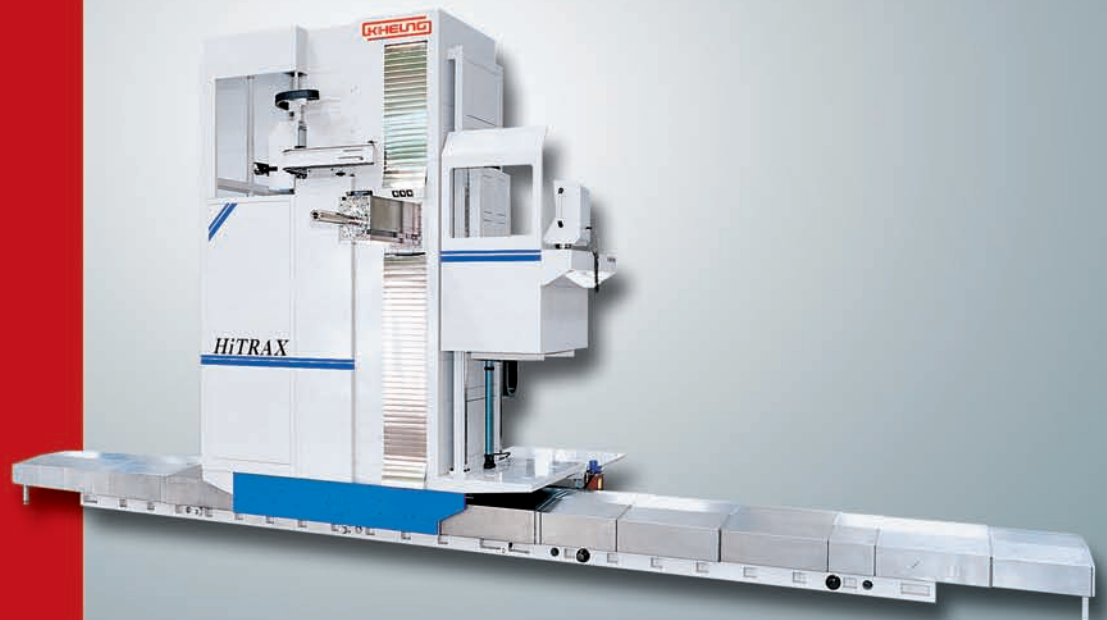


# COLUMN TRAVEL MILLING and BORING CENTER

**HiTRAX-U**  
**HiTRAX-H**





**KIHEUNG MACHINERY CO., LTD**  
MILLING MACHINE / MACHINING CENTER / COLUMN TRAVEL

# KIHEUNG ENDEAVOURS TO OFFER THE ULTIMATE TO CUSTOMERS THROUGHOUT THE WORLD.

Since founded in 1968, KIHEUNG has become one of the most advanced and leading machine tool manufacturers with an effort to supply high quality product to customers.

KIHEUNG specialized in CNC bed type milling machine, travelling column boring and milling center, Double column machining center, Simultaneous five axis machining center, Double column 5 axis and vertical turning machine, is determined to enhance the quality by respecting the customer's requirements with the philosophy of

## “FULL SATISFACTION TO THE CUSTOMER AND ENDLESS SERVICE TO THE CUSTOMER”

Through the spirit of mutual co-operation, KIHEUNG is able to ensure the continuous distribution with high quality machine tools designed to satisfy customer's requirements all over the world. Thanking and trusting in your continuous support.

### KIHEUNG History

- 1968** KIHEUNG machinery works founded
- 1978** Developed conventional bed type milling machine
- 1989** KIHEUNG foundry Co. established  
Start to exhibit EMO exhibition
- 1990** Developed CNC bed type milling machine
- 1995** The current plant(20,000 m<sup>2</sup>) established in Daejeon, Korea
- 1996** CE certificate from TÜV, Germany
- 2002** KIHEUNG USA established
- 2003** Awarded ISO 9001 certificate
- 2004** Developed double column machining center, MiMAX
- 2005** Developed simultaneous 5 axis machining center, FTV 500
- 2006** Developed column travel boring and milling center, HiTRAX
- 2007** Developed double column 5 axis and vertical turning machine, FTU 1200
- 2008** KIEHUNG Germany established  
Developed fixed bed column travel boring and milling center, RiGiTRAX
- 2009** Awarded 20 million dollar export prize from Korea government
- 2010** Developed column travel boring and milling center, WiNGTRAX

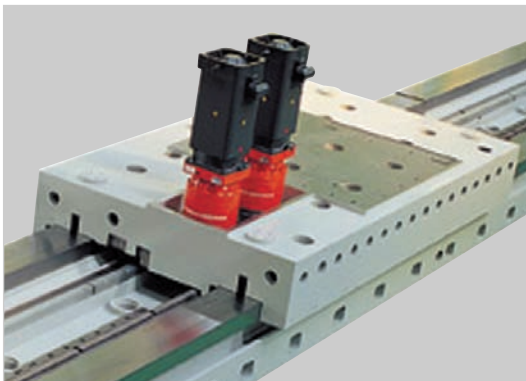


**HiTRAX-U****Column Travel Milling Center**

X=0~20000mm, Y=1350 / 1500mm, Z=2500~3500mm

**Feeds and Guideways**

- High rapid feed of 18000mm/min. for X, Y, Z axis with heavy duty cutting performance.
- Siemens / Fanuc AC servo motor for X, Y, Z axis
- X axis movement with Twin-Drive system is composed of preloaded rack and pinion system with 2 servo motors for "dynamic movement". One is actual driving, while the other is braking for "backlash free"
- Y and Z axis movement with preloaded double nut high precision ball screw
- Heidenhain linear scale for X, Y, Z axis
- Automatic centralization lubrication system
- Telescopic chip cover for X axis and complete sheet metal cover for Y and Z axis



Longitudinal X-axis movement with Twin-Drive system





### Flat-Ram design

Flat-Ram design can not be disturbed with “inside-works”, because all the transmission equipments (ZF gear box, Belt / Pulley) are located in the rear of the ram.

Furthermore, all the chips and coolant water can be protected perfectly and conveyed to the chip reservoir and coolant tank effectively.



### Universal Head

Universal head consisting of upper head and lower head can be turned to desired angle, which is suitable for combined angle milling.

### High Quality Component

- CNC: HEIDENHAIN, SIEMENS, FANUC
- Linear scale: HEIDENHAIN
- Motor (Spindle, Axis): SIEMENS, FANUC
- Spiral bevel gear for universal head : TANDLER, Germany
- Reducer gear box for longitudinal axis : REDEX ANDANTEX, France
- Rack and Pinion for longitudinal axis :Güdel, Swiss
- Ball screw for cross and vertical axis : KORTA, Spain
- Roller shoes and guide way for longitudinal and vertical axis: INA, Germany
- Hydraulic unit: HAWE, Germany
- Lubrication pump: DROPSA, Italy



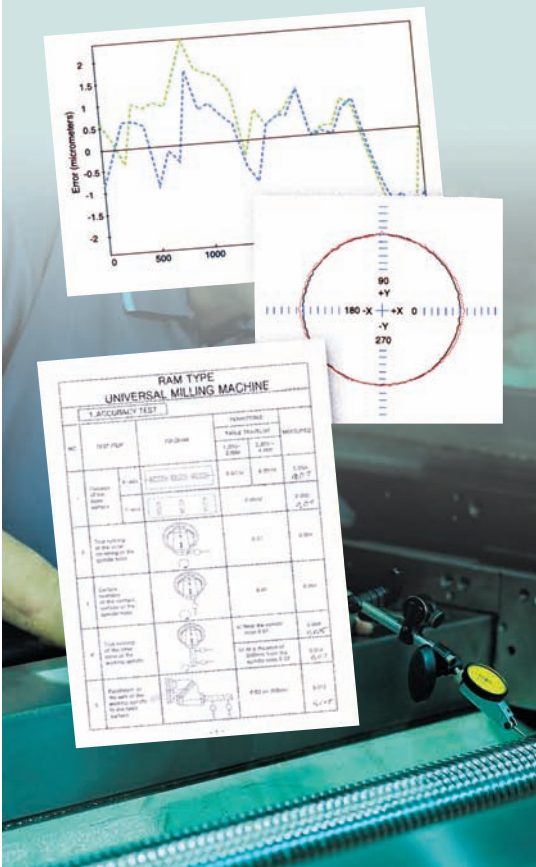
HiTRAX with Direct Horizontal Spindle

## KIHEUNG Quality Machine

KIHEUNG's every machine is tested with 100% actual machining to check the cutting power.

Furthermore, geometric accuracy is tested during assembly and after assembly.

Final geometric accuracy test report is delivered together with the machine.



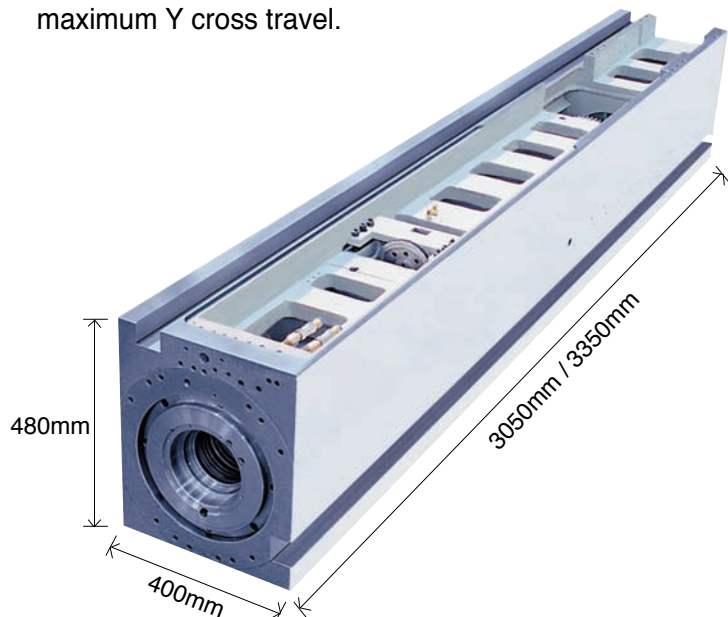
### Cross travel

Cross travel 1350mm / 1500mm can be allowed only with the modern design of the flat ram with the total length of 3050mm / 3350mm and the section 480 x 400mm with elaborately guided slide way.



### Ram

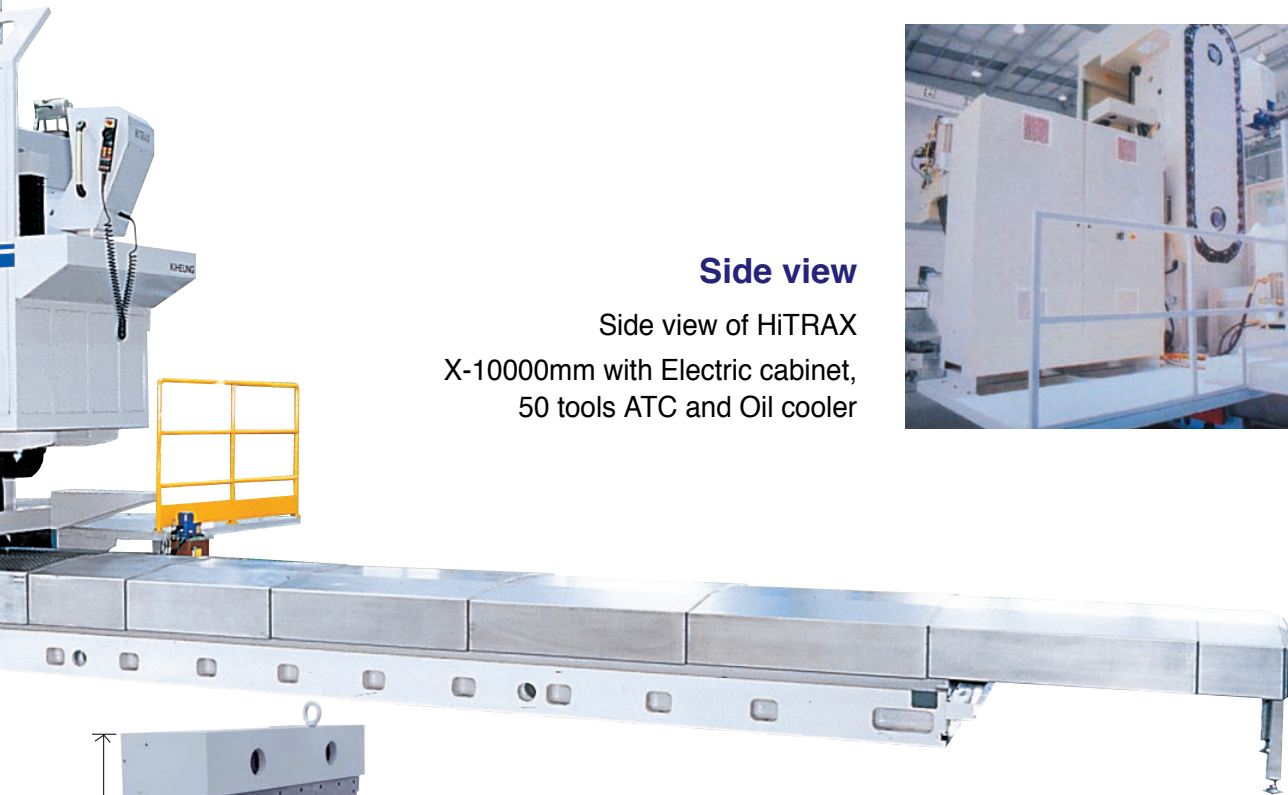
8-faces with 4 ground way and 4 gib way for a high milling performance and geometric accuracy during critical maximum Y cross travel.





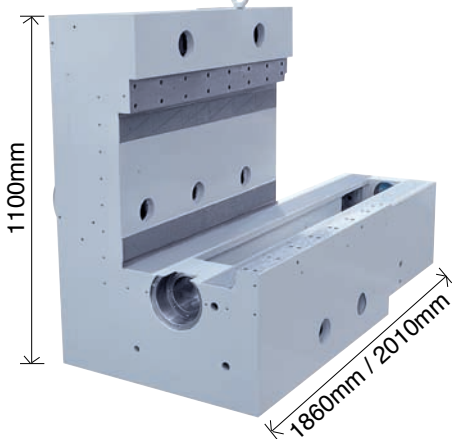
### Elevating platform

Elevating platform, which is supplied as standard, enables the operator to stay at the ideal working position.



### Side view

Side view of HiTRAX X-10000mm with Electric cabinet, 50 tools ATC and Oil cooler

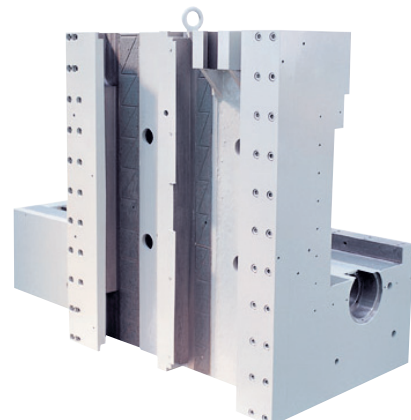


### Saddle for cross movement

Saddle with 1860mm / 2010mm guide way length, which is long enough to prevent "ram drooping", guarantees geometric accuracy during critical maximum Y cross travel.

### Saddle for vertical movement

Saddle with 6 turcite guide way and 1 gib way in combination with 2 roller shoes reduces "stick-slip" and reaches to the "damping effect" for the smooth vertical movement. Furthermore, it prevents saddle deviation during critical maximum Y cross travel.





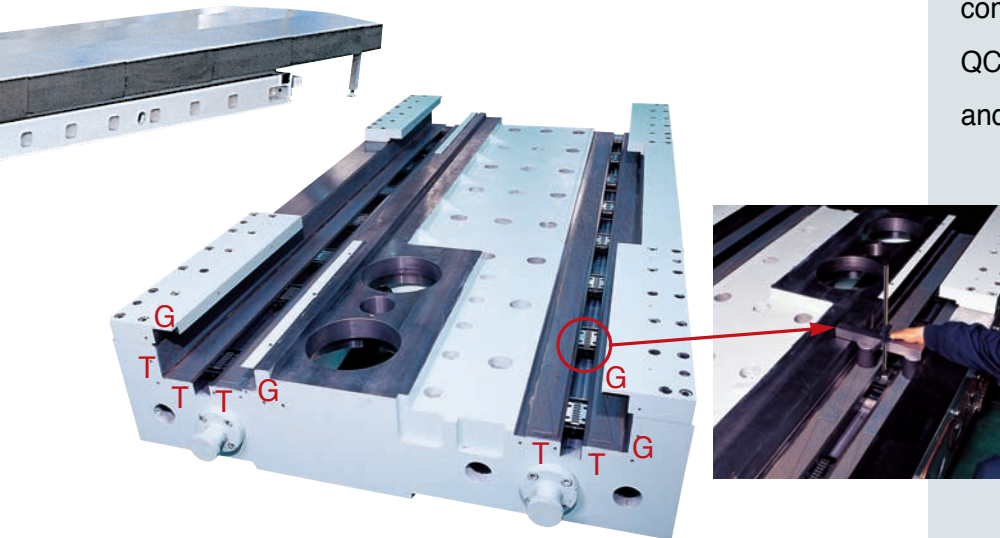
## Machine base

Strong 2-fold (each 250mm width) machine base with 9 ground guide ways in combination with center - embedded steel track for roller shoes guarantees "stick-slip free" and "smooth movement" of the longitudinal X axis movement with strong and heavy column.



## Head, Ram and Spindle

- Universal bi-rotary M(manual) head (45° / 90°), which can be positioned manually infinitely variable, as standard equipment.
- Max. spindle speed 4000 rpm - also in continuous operation - is ensured with high quality component, such as spiral bevel gear (TANDLER, Germany) and bearing (SKF) as well as head cooling system, which is supplied as standard.
- High spindle torque with 2 step ZF gear box.
- SIEMENS 37 / 56kw high torque spindle motor guarantees heavy duty cutting.
- Cooling system of Head, Ram and ZF gear box reduces the heat, which prevents spindle extension during high spindle speed. Hotted oil inside of ZF gear box and upper head (90°) is delivered quickly to the oil cooler through two pumps on the ram.



## KIHEUNG Quality Machine

In order to guarantee the positioning and repeatability accuracy as well as roundness, every KIHEUNG machine, which is equipped with Heidenhain linear scale as standard, is inspected with laser for backlash and pitch error compensation, meanwhile Renishaw QC10 ball bar test for the roundness and geometric accuracy

### Column base

Column base with 5 turcite guide ways and 4 gib ways in combination with 16 roller shoes reduces “stick slip” and reaches to the “damping effect” for the smooth movement of the column longitudinal travel.

### Column

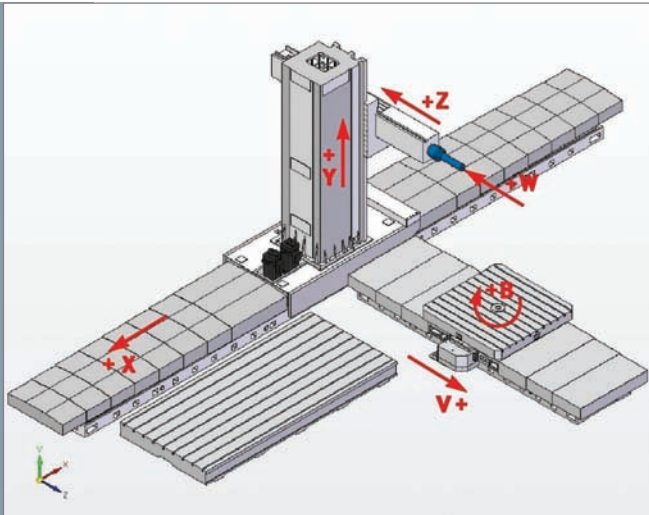
Strong 3 - fold column with 7 ground guide ways in combination with 1 steel guide way for INA roller shoes.



# HiTRAX-H

## Column Travel Boring Center

X=6000~20000mm, Y=2500~3500mm, Z=1250mm, W=700mm



X8000 / Y3500mm / Z1250mm / W700mm



### Boring spindle

HiTRAX-H is equipped with  $\phi 130\text{mm}$  boring spindle with 700mm travel.

Ram 1250mm + Boring spindle 700mm = 1950mm travel.

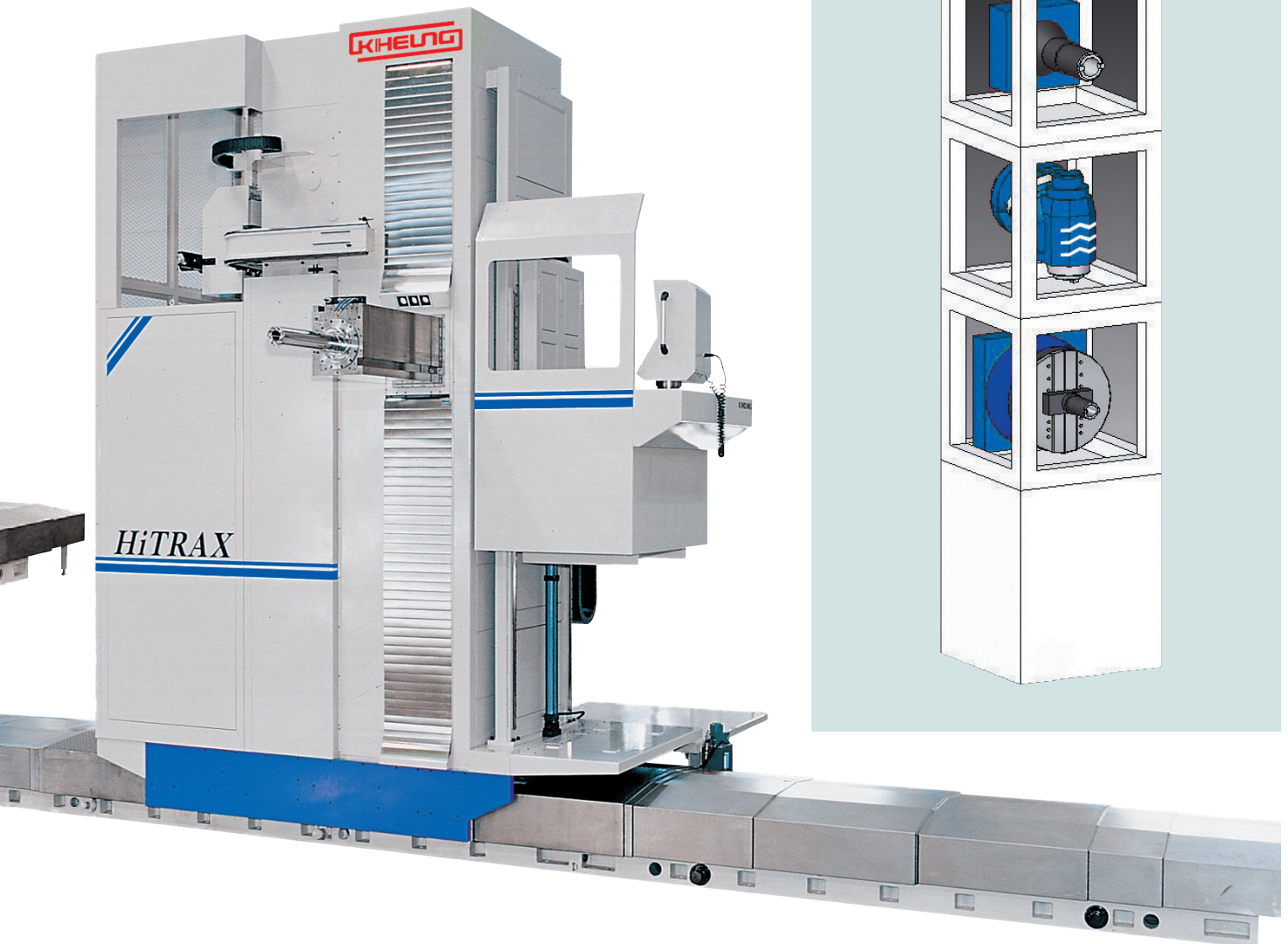
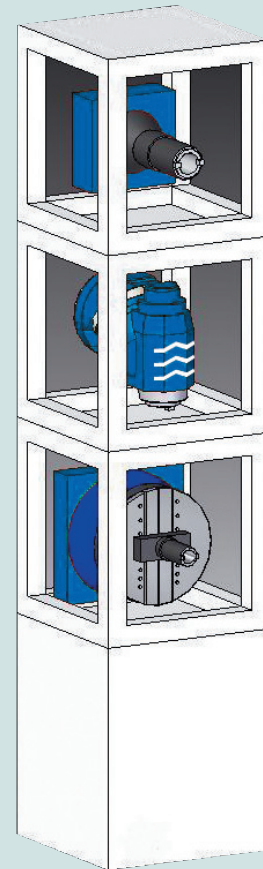
High milling and boring performance can be achieved with the excellent ram geometry and elaborately guided boring spindle.

# Option

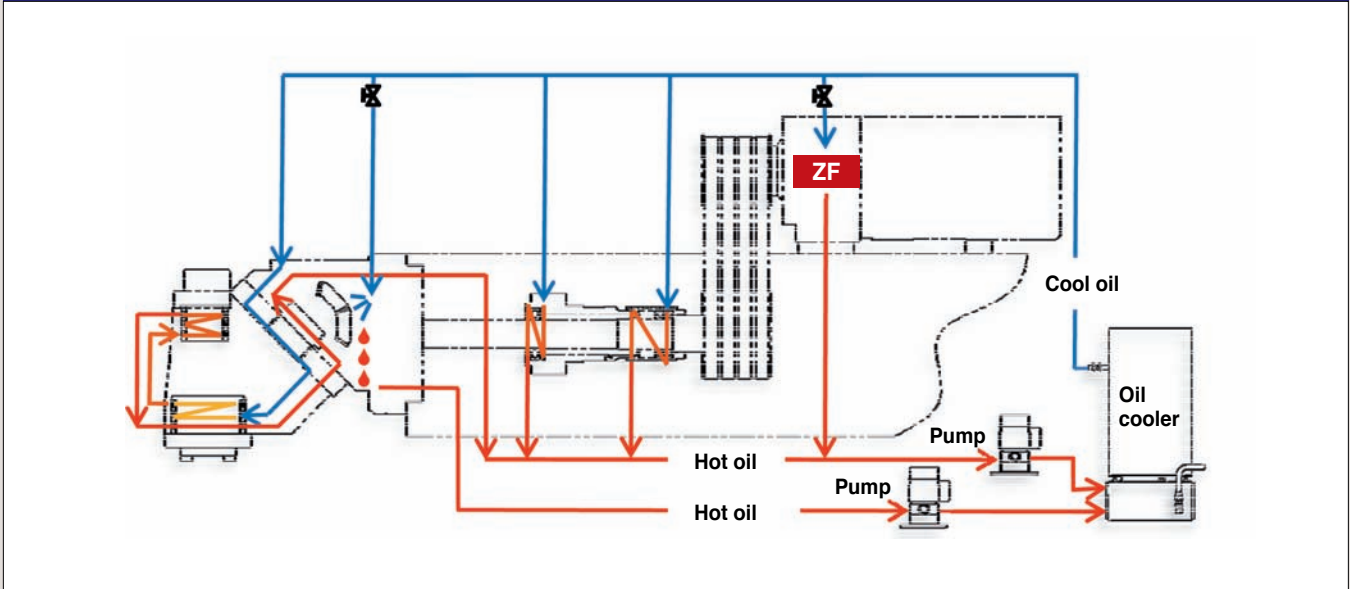
## Head Change Station

HiTRAX-H can be fitted with various kinds of head (universal head, extension head and facing head manually and automatically).

These head can be picked up from Head Change Station.



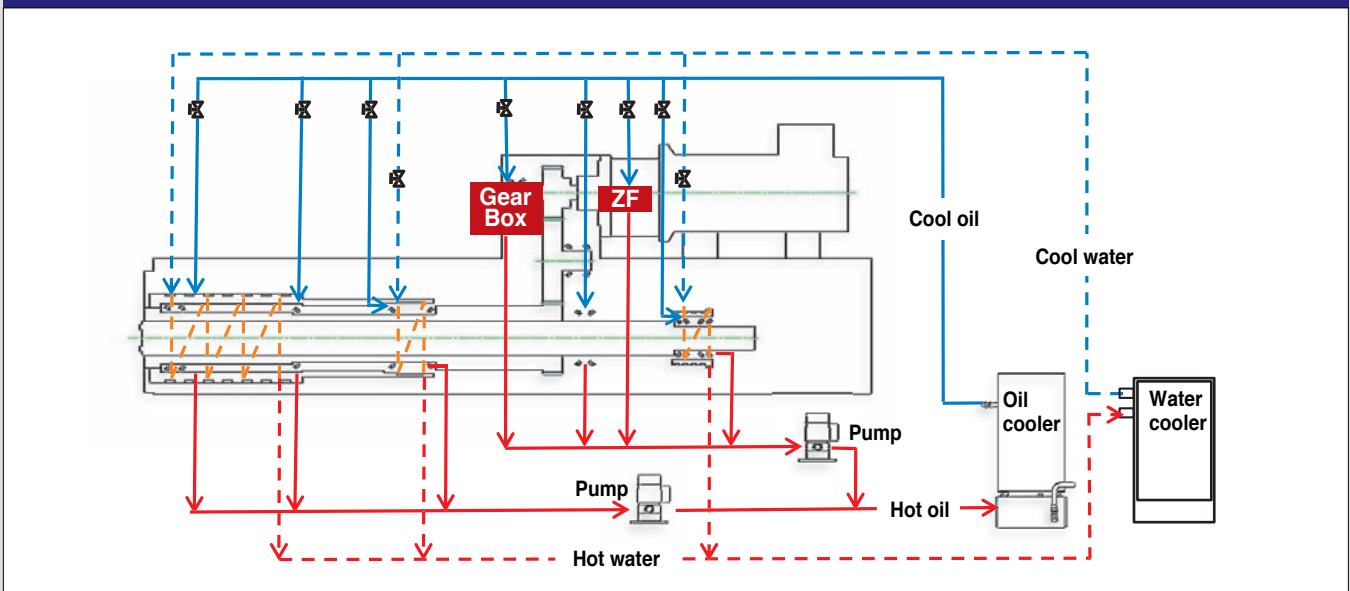
HiTRAX-U : Oil cooling



**Oil cooling**

Head and ZF gear box is cooled by oil cooler.  
 Hot oil inside the upper head (90°) and ZF gear box is delivered quickly to the oil cooler through 2 (two) pumps on the ram.

HiTRAX-H : Oil cooling+Water cooling



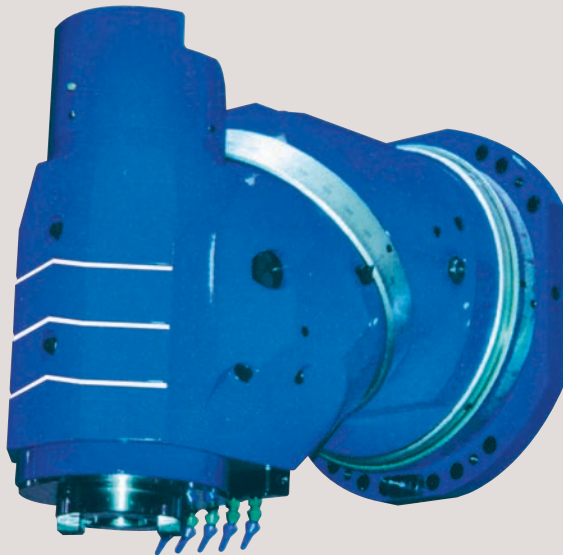
**Oil cooling**

Gear box (ZF + Reduction) and boring spindle bearing is cooled by oil cooler. Hot oil inside the gear box and boring spindle bearing is delivered quickly to the oil cooler through 2 (two) pumps on the ram.

**Water cooling**

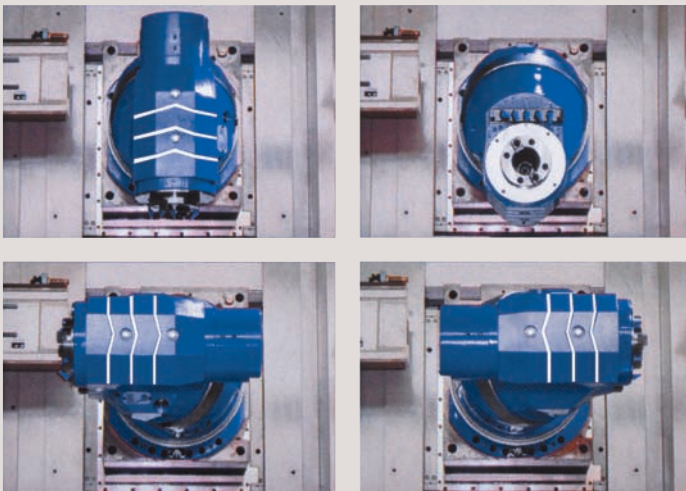
Boring spindle cartridge is cooled by water cooler.

# Option



## Automatic universal milling head A4 plus

- ISO50 DIN69871
- Automatic 2.5° x 2.5° positioning (144 x 144=20736 positioning)
- Hydraulic tool clamp / unclamp
- 4000 spindle rpm with cooling of the head



# Option



## Tool touch probe HEIDENHAIN TT140

with cable connection for tool length and radius compensation with stationary or rotating spindle



## Work piece touch probe HEIDENHAIN TS220

for releasing a trigger signal to the iTNC 530 control through cable



## Work piece touch probe HEIDENHAIN TS640

for releasing a trigger signal to the iTNC 530 control as an infrared light signal



## Work piece touch probe RENISHAW RMP 60

with radio signal transmission

## KIHEUNG Total Quality Control

KIHEUNG's total quality control system is for KIHEUNG people to realize that

"Everybody, every work has an influence on total machine quality"

In order to come true the total quality control, critical components such as universal head, ram etc, are subject to strict inspection inside the clean room with high precision CMM.

Also critical units such as spindle, ATC after having been assembled, are further subject to strict operation test.

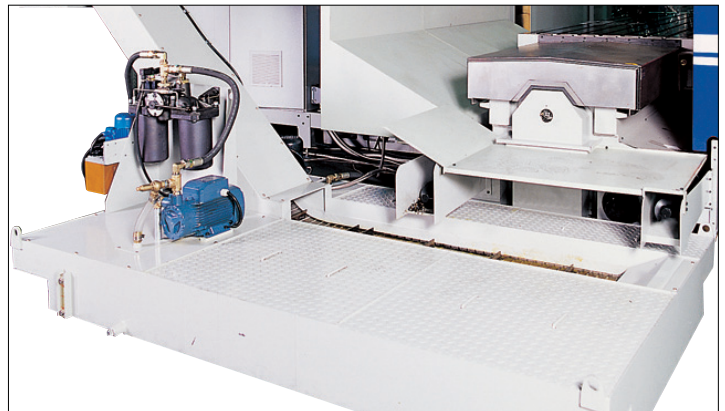


# Option

## Coolant through Spindle

### 1. CTS 2 (two) Pump - Cartridge filter

- 16 bar coolant through spindle  
9 bar coolant through nozzle
- Tank volume 500 ℓ
- Dual cartridge filter (20 μm) to switch over when one filter is dirty

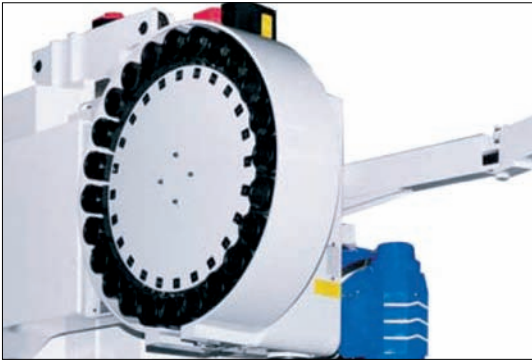


### 2. CTS 3 (three) Pump- Paper filter

- 16 / 30 bar coolant through spindle  
9 bar coolant through nozzle
- 2 (two) Tanks : 1 (one) dirty tank volume 500 ℓ  
1 (one) clean tank 1200 ℓ
- Paper band filtering (10 μm) system with drive and paper transport unit



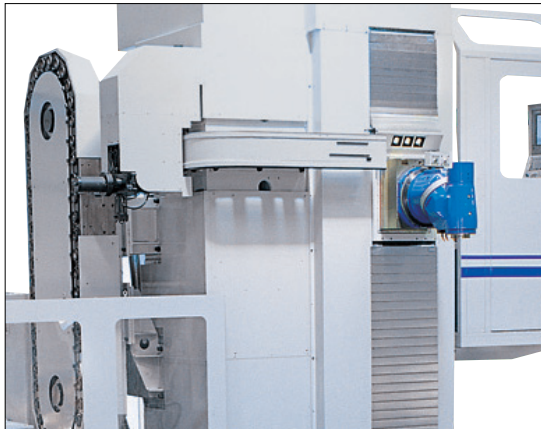
# Option



## Vertical automatic tool changer for 24 tools

Twin arm gripper is driven by geared motor with cam and cam follower.

Max. tool weight	.....	20kg
Max. tool length	.....	350mm
Max. tool diameter		
When adjacent tool present	.....	110mm
When adjacent tool absent	.....	200mm



## Vertical / Horizontal automatic tool changer for 30 / 40 / 50 / 60 / 90 tools

- High quality tool changing system, which reduces the tool changing time up to 30 seconds, compared with horizontal automatic tool changer.
- Tool magazine is driven by servo motor. Carriage and twin arm gripper is driven by hydraulic.

Max. tool weight	.....	25kg / 35kg
Max. tool length	.....	350mm / 500mm
Max. tool diameter		
When adjacent tool present	.....	125mm
When adjacent tool absent	.....	250mm



## Chip conveyor

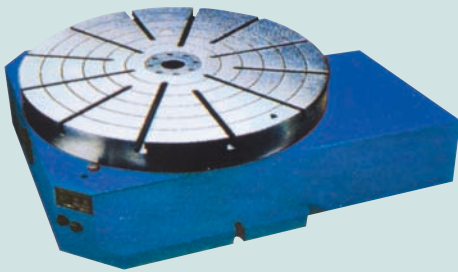
Wider link type chip conveyor performs "QUICK EXTRACTION" of chips and coolant water to the bucket and tank.

# Option

## CNC Rotary table

KIHEUNG supply CNC Rotary table as option.

- Diameter 450mm~
- Continuous 0.001°
- Max permissible load until 25,000kg



Horizontal Rotary Table

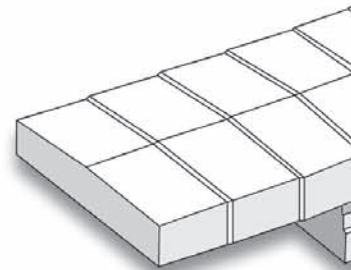
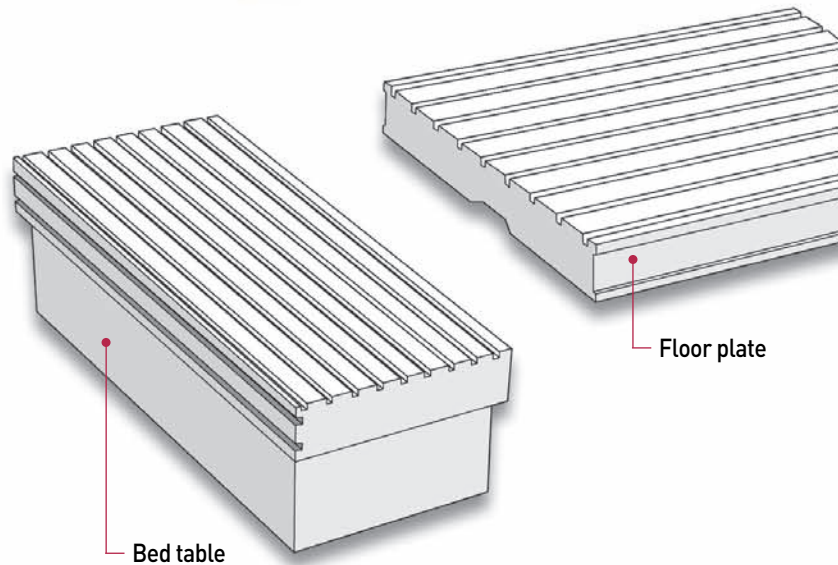
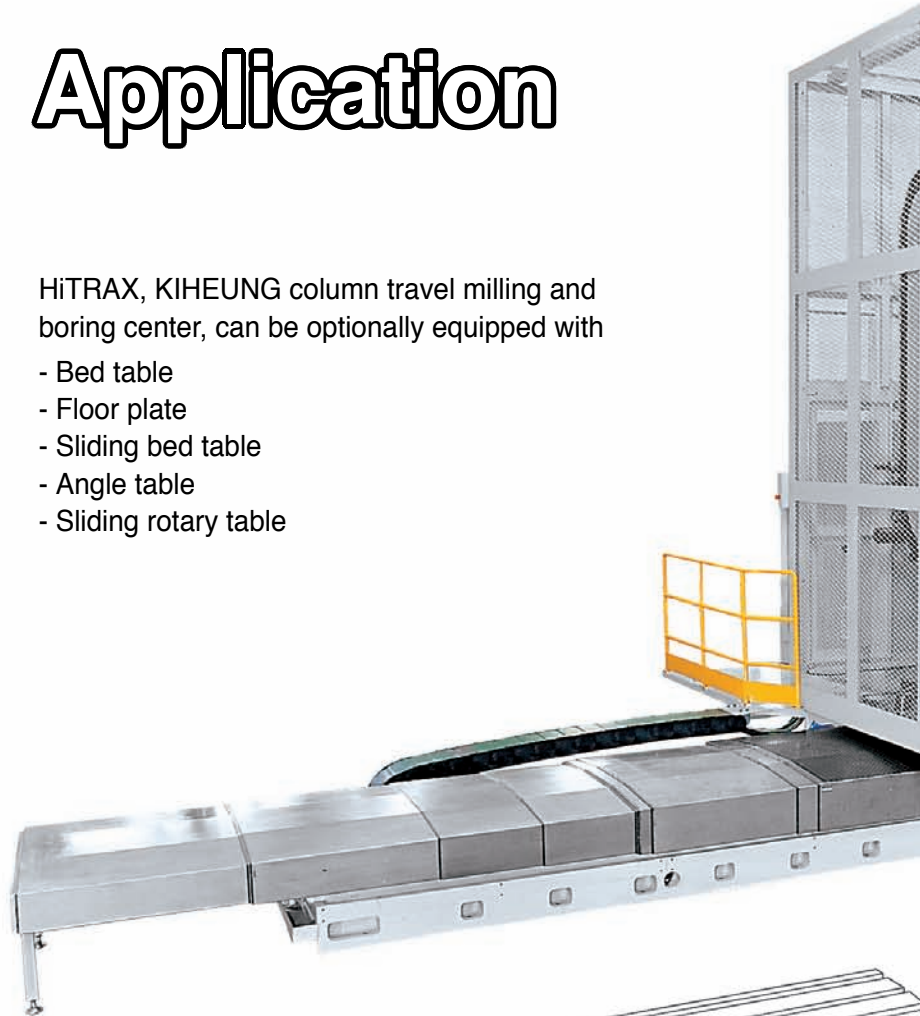


Horizontal - Vertical Rotary Table

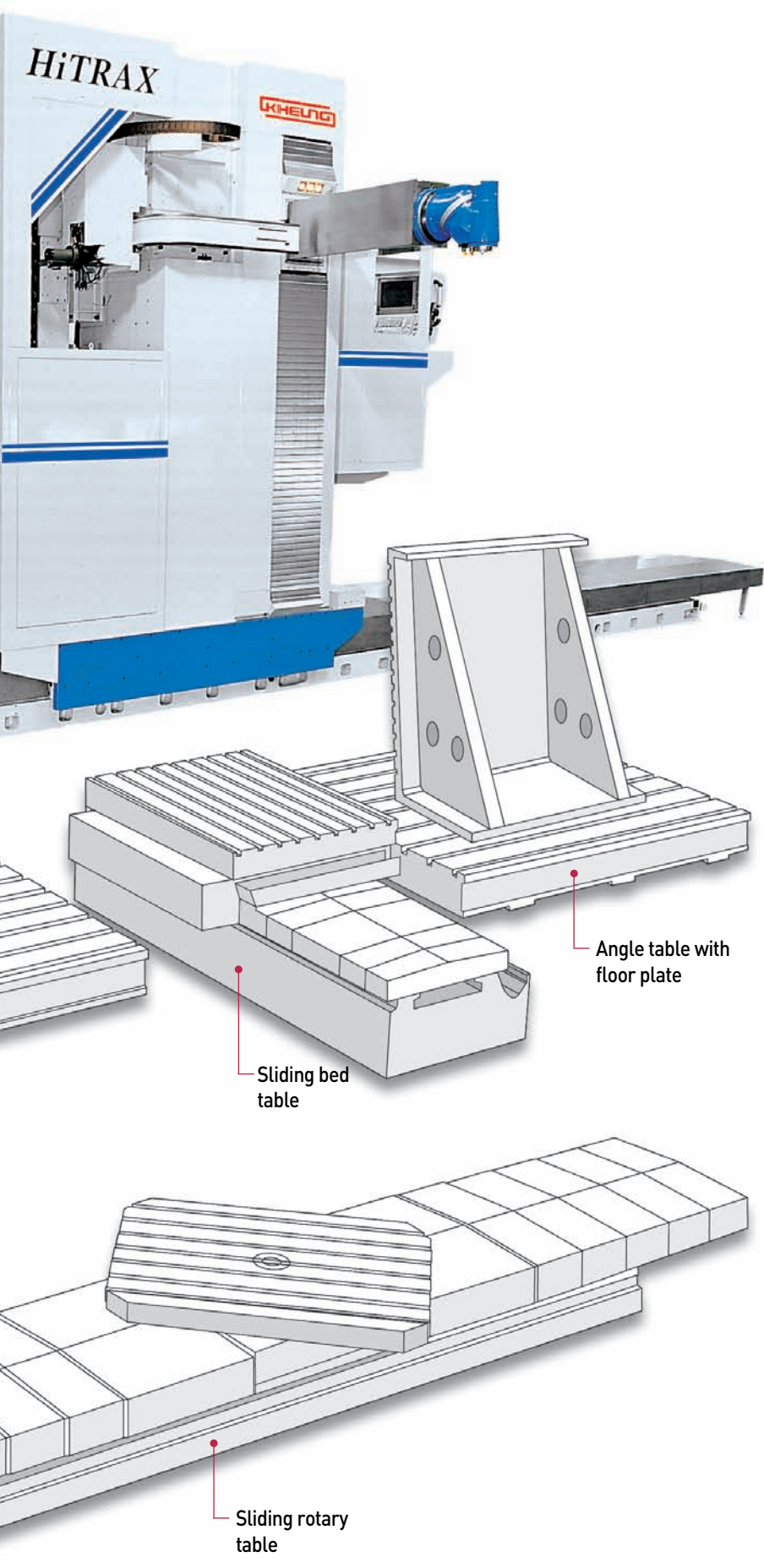
# Application

HiTRAX, KIHEUNG column travel milling and boring center, can be optionally equipped with

- Bed table
- Floor plate
- Sliding bed table
- Angle table
- Sliding rotary table







## KIHEUNG Foundry

The material used for KIHEUNG's all major and critical parts, such as base, column, saddle, table, ram and head is made by KIHEUNG Foundry.

## High-Quality Cast iron

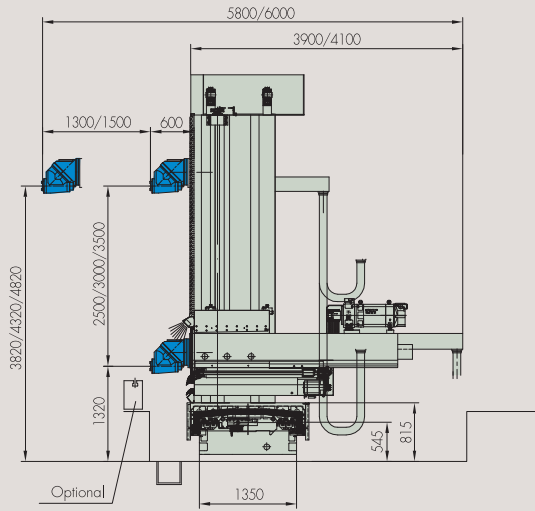
KIHEUNG cast iron has the advantage both thick and thin parts have the same properties after cooling.

KIHEUNG's techniques through control of the casting process permits the production of reliable, high quality material with no defects such as shrinkage cavities, coarse crystal structure and keep on maintaining accuracy for a long time.

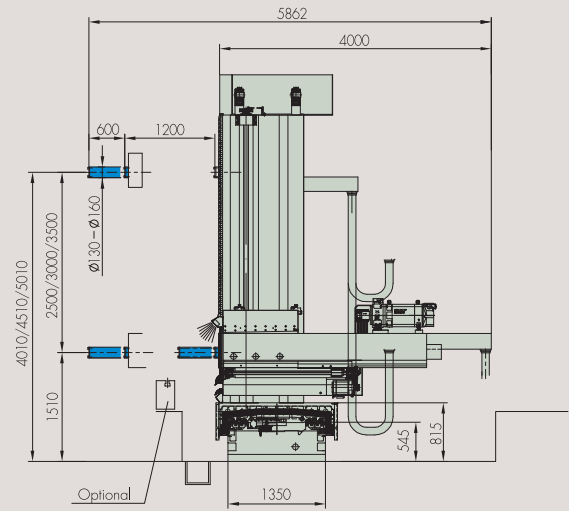


Machine Dimension

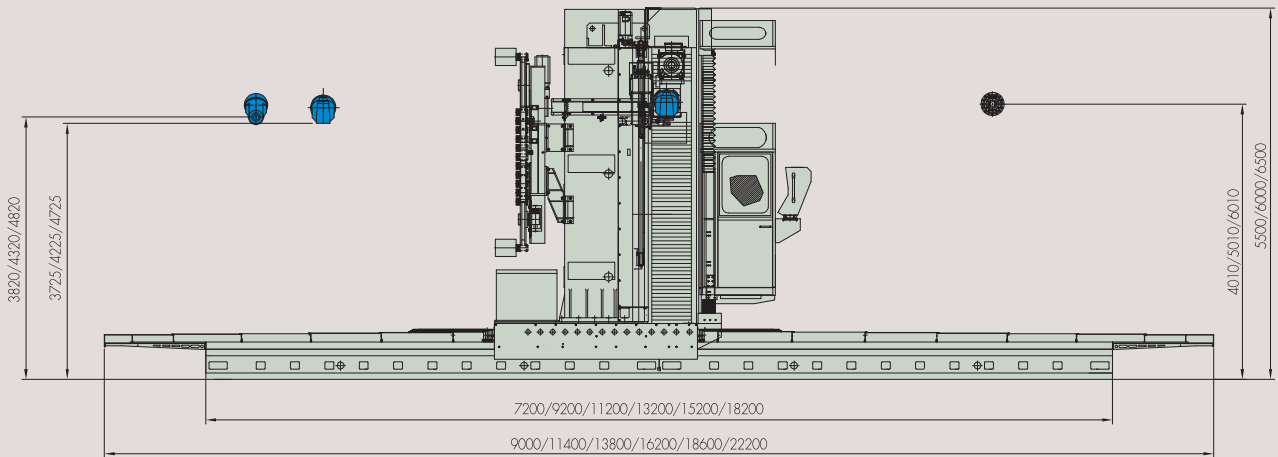
HiTRAX-U(A4 head)



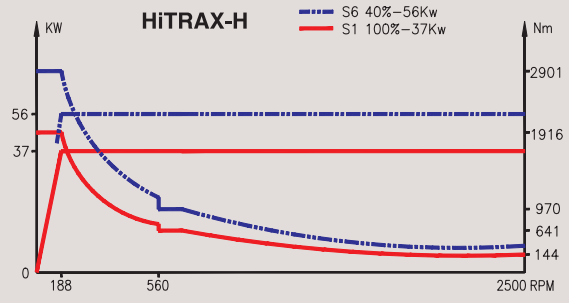
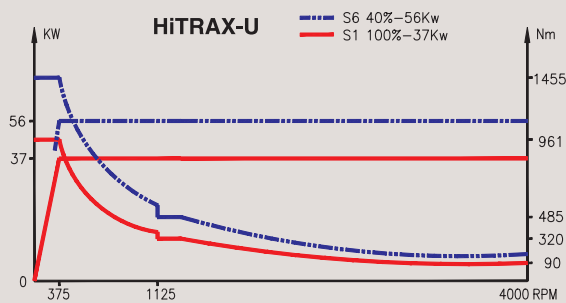
HiTRAX-H



HiTRAX-U(A4 head) / HiTRAX-H



Spindle Motor



## Standard

### HiTRAX-U / HiTRAX-H

- Heidenhain iTNC530 HSCI BF150 CNC with smart TNC, Mouse pad
- Heidenhain linear scale
- Siemens spindle motor  
37kw(S1 100%) / 56kw(S6 40%)
- Spindle orientation for rigid tapping
- Hydraulic balance with accumulator for vertical axis
- Electronic hand wheel (HR410 for Heidenhain CNC)
- Elevating platform
- Flood coolant system
- Automatic power off with M function

### HiTRAX-U

- M (Manual) head with DIN2080 / DIN 69871
- ZF gear box with 2 step automatic gear change (1~1125 / 1126~4000 rpm)

### HiTRAX-H

- Boring spindle  $\varnothing$ 130mm, travel 700mm
- 2 step ZF gear box and reducer gear box (1-560 / 561-2500 rpm)

## Option

### HiTRAX-U / HiTRAX-H

- Other CNC: Siemens, Fanuc
- Coolant through spindle with dual filter, 16 bar  
Coolant through spindle with paper filter, 16 / 30 bar
- Automatic tool changer
  - Vertical : 24 tools
  - Horizontal : 30 / 40 / 50 / 60 / 90 tools
  - Vertical / Horizontal : 30 / 40 / 50 / 60 / 90 tools
- Link type lift up chip conveyor
- Floor plate L x W x H  
: 3000 / 4000 / 5000 / 6000 / 7000 / 8000mm x 2000mm x 300mm
- Angle plate  
: 2000 / 2500 / 3000(H) x 1000(W) x 1200mm
- Tools and Work piece probe (See page 12)
- Preparation of the 4th / 5th axis
- CNC rotary table
- CNC sliding rotary table

### HiTRAX-U

- A2 head (Automatic Vertical / Horizontal)
- A4 head (2.5° x 2.5°)

### HiTRAX-H

- M head (Manual positioning)
- A2 head (Automatic Vertical / Horizontal)
- A4 head (2.5° x 2.5°)
- Extension head (Length 500mm, Diameter 210mm)
- Boring and facing head
- Preparation of M, A2, A4, Extension, Boring and facing head manual fit / remove
- Preparation of A4, Extension, Boring and facing head automatic fit / remove with Head change station

KIHEUNG		HITRAX-U	HITRAX-H
<b>Travel</b>			
X-axis	mm	6000 / 8000 / 10000 / 12000 / 14000 / 16000 / 18000 / 20000	
Y-axis	mm	1350(1500 Option)	1250
Z-axis	mm	2500(3000 / 3500 Option)	
W-axis	mm	-	700
<b>Feed</b>			
Rapid feedrate	mm/min	18000	
Axis feedrate	mm/min	10000	
<b>Spindle</b>			
Shank	ISO	50	
Speed	rpm	1-1125 / 1126-4000	1-560 / 561-2500
Motor	kw	37 / 56	
<b>Weight</b>	ton	40 - 90	



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