

**VISION  
WIDE**

HF series

5-Face Machining Center



## Vision Wide Product Range



<p>5-axes machining X:1.2~10m Y:1.2~6m</p> 	<p>Table moving HSM FA Series</p> 	<p>Gantry moving HSM GSF Series</p> 	<p>Advance material application ADM Series</p> 	<p>Universal HSM ASM Series</p> 
<p>Multi-angle Machining X:2~60m Y:1.2~4.9m</p> 	<p>Extremely Mighty M/C XM/XML/XMS/XMF Series</p> 	<p>Bridge moving portal M/C BM Series</p> 	<p>Heavy duty M/C VB/VF Series</p> 	<p>High efficiency M/C SF/NF/HF Series</p> 
<p>General Machining X:1.6m~4m Y:1.3m~2.7m</p> 	<p>Horizontal Boring and Milling M/C VBT Series</p> 	<p>High efficiency M/C SM Series</p> 	<p>Table moving HSM SE Series</p> 	<p>Gantry moving HSM GS/GSA Series</p> 

Heavy Duty



Speedy Machining



# Application and Solution

## Industrial application



Vehicle outdoor mold (FCD)



Vehicle indoor decoration mold (FCD)



Die-casting mold (alloy steel)



Injection mold



Milling:  
Guide rail of machine tool



Industrial lifting machinery machining



Tire mold (FCD)



Steel-machining

## Industrial application



Aerospace aluminum structural processing



Car engine



Drilling :  
Tube sheets of heat exchanger



Train chassis



Boring:  
Large-sized hole of parts



3D Dies



Gear box circular profile machining



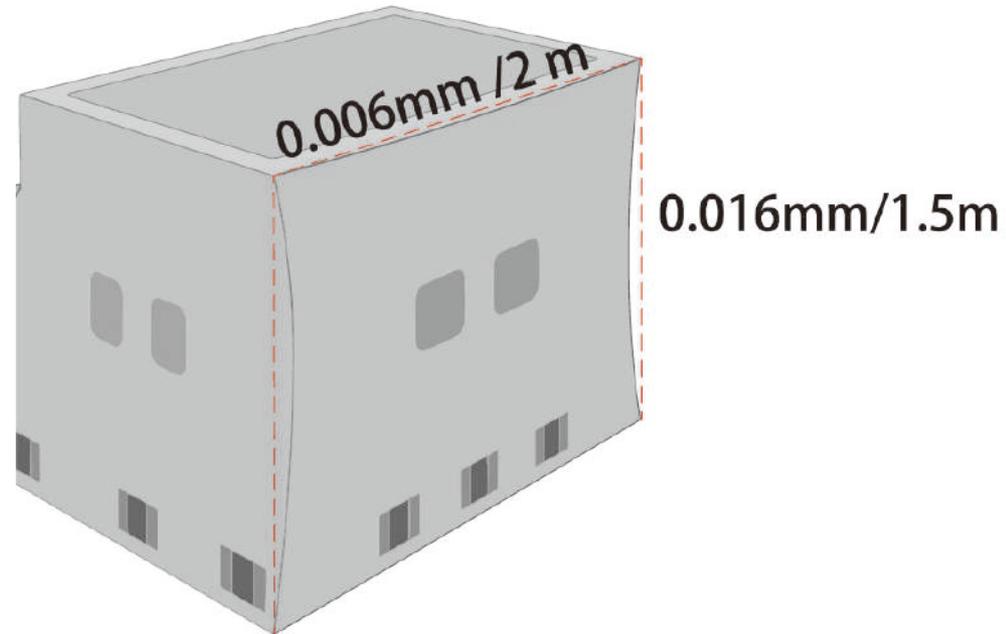
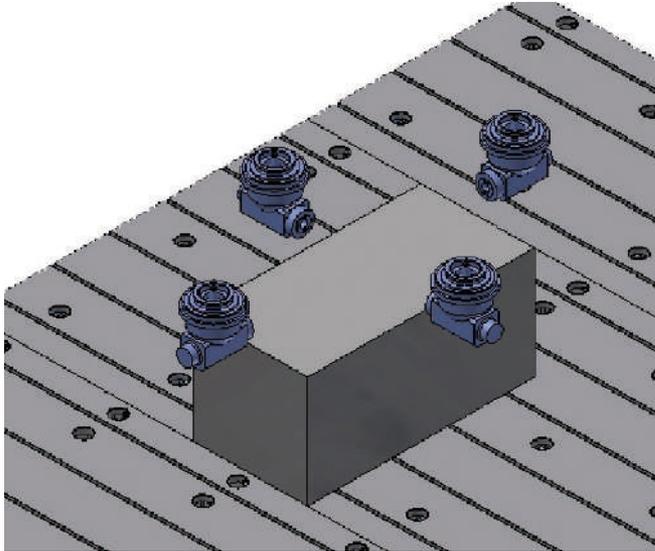
LCD vacuum chamber machining (stainless steel)



## Application Feature

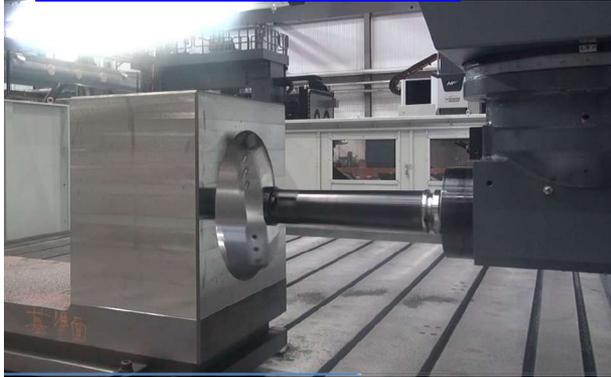
- Straightness accuracy of X axis : 0.005mm/m  
Y axis : 0.010mm/m
- Squareness accuracy of XY/YZ/XZ: 0.015mm/m
- High rigidity Ram Structure
- Cylindricity accuracy of opposite Boring: 0.015mm
- Automatic Attachment head change
- Automatic Vertical/Horizontal tool change
- TCPM intelligent control

## High Geometry Accuracy Machining Performance



# Exclusive Configuration for Deep Cavity Precision Boring Machining

600 mm Long Shank Boring  
Power AC90°Head



Small Cavity Machining



600 mm Depth Bearing  
Feature Boring.  
Extend AC90°Head



Extend shaft



# Exclusive Configuration for Deep Cavity Precision Boring Machining

## 600 mm Depth Boring





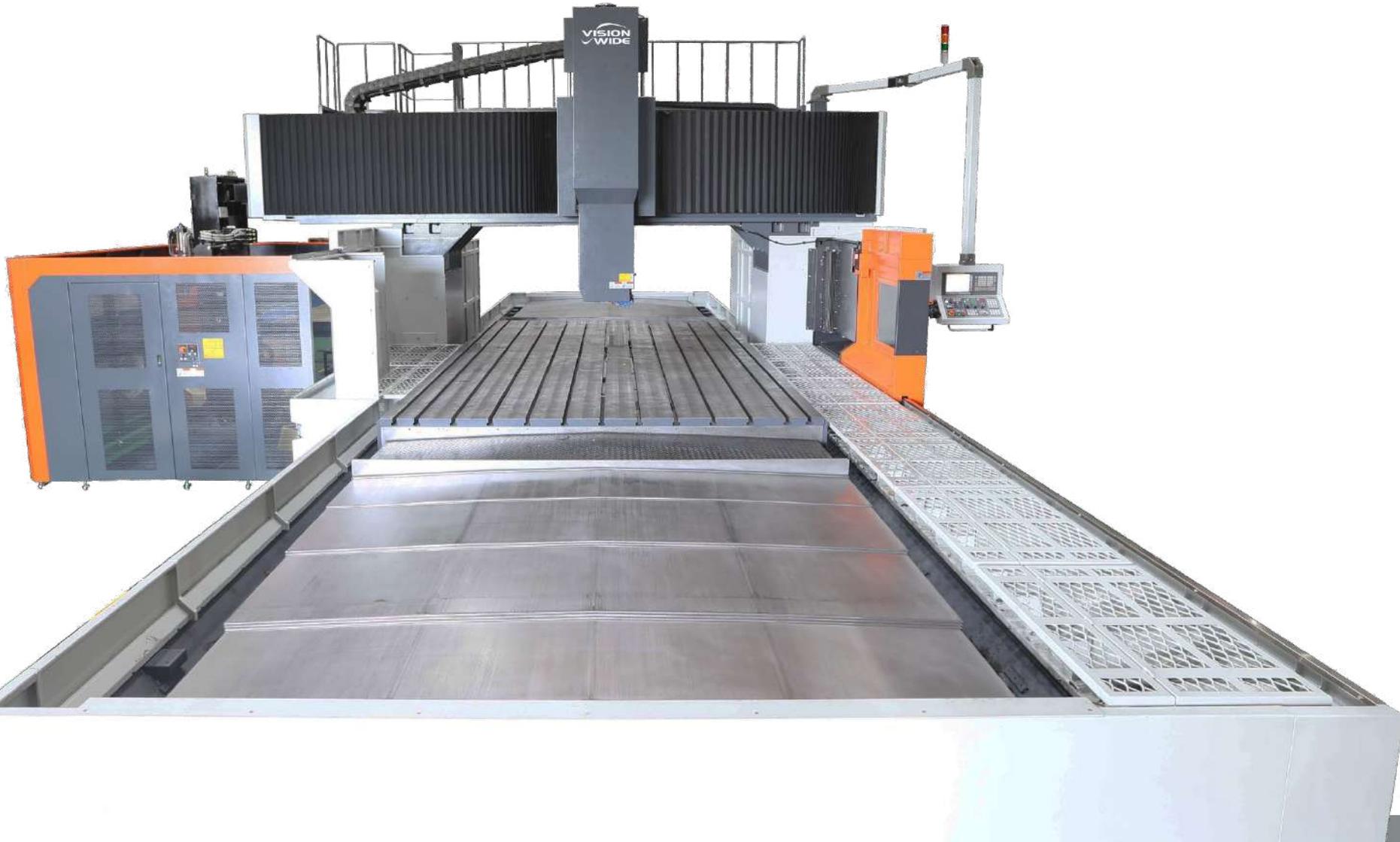
# Machine Main Specification

*HF series*

# Five-Face Machining Center



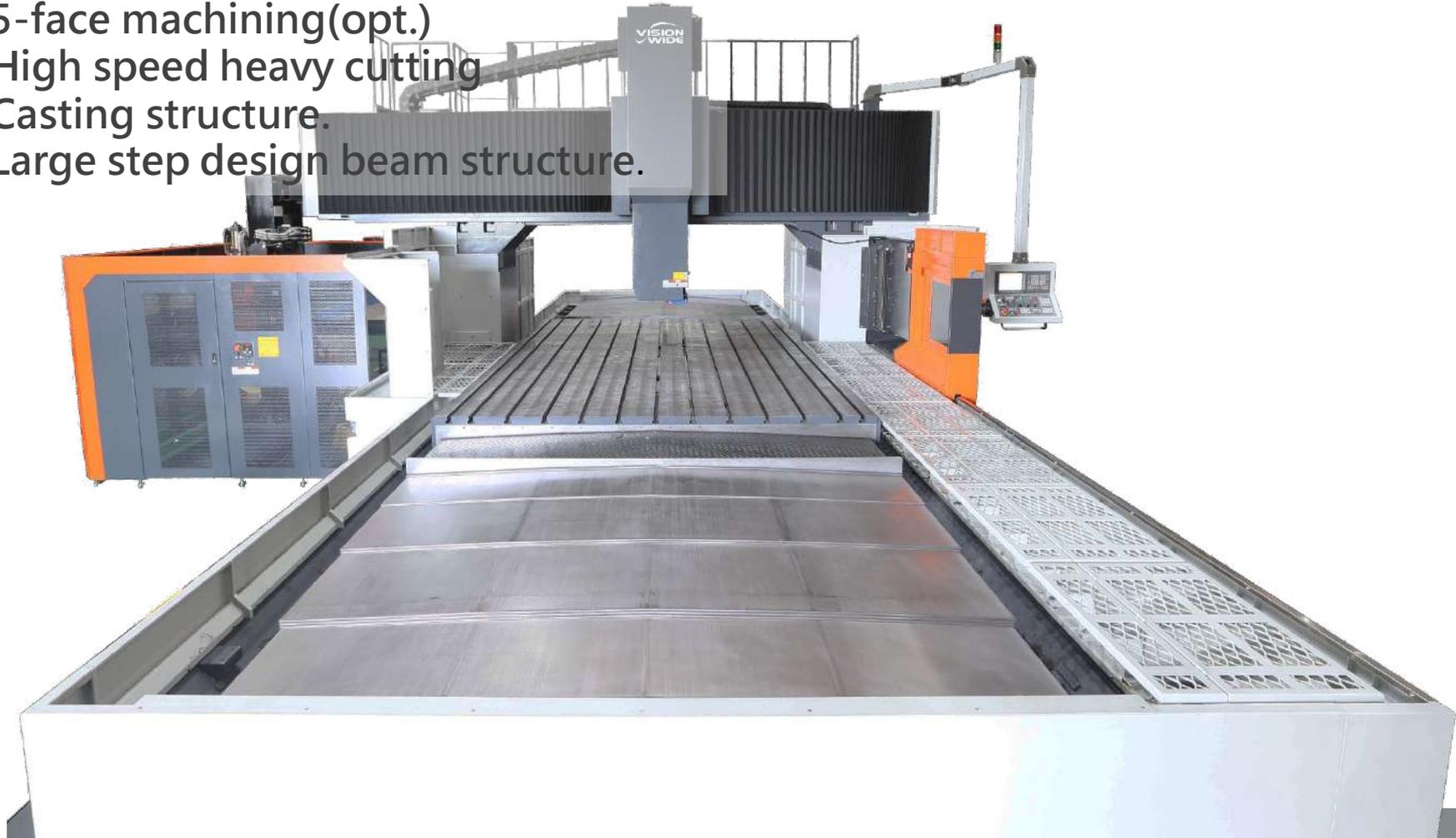
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# Five-Face Machining Center

## High Efficiency and Performance Double Column Machining Center

- High efficiency machining Fully auto.
- 5-face machining(opt.)
- High speed heavy cutting
- Casting structure.
- Large step design beam structure.



## X axis travel

- 4,100 ~ 10,100mm



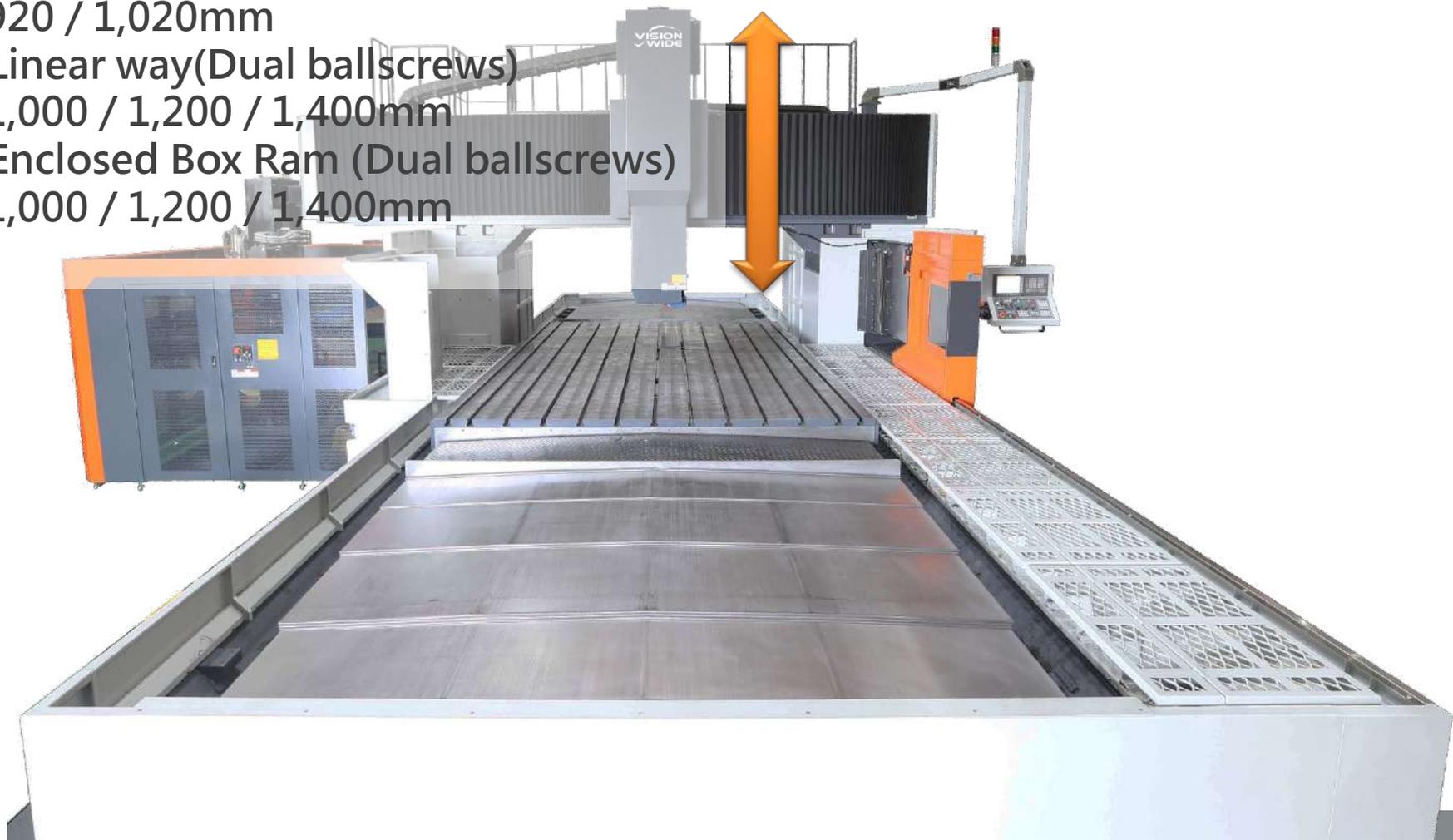
## Y axis travel

- 3,500 / 4,000 / 4,200 / 4,700 mm



## Z axis travel

- Box way(Single ballscrew)  
920 / 1,020mm
- Linear way(Dual ballscrews)  
1,000 / 1,200 / 1,400mm
- Enclosed Box Ram (Dual ballscrews)  
1,000 / 1,200 / 1,400mm

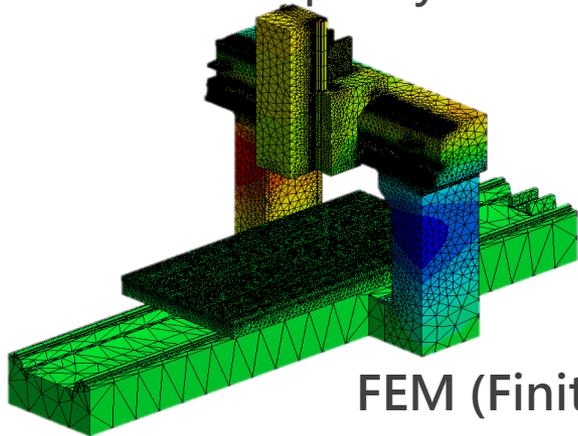




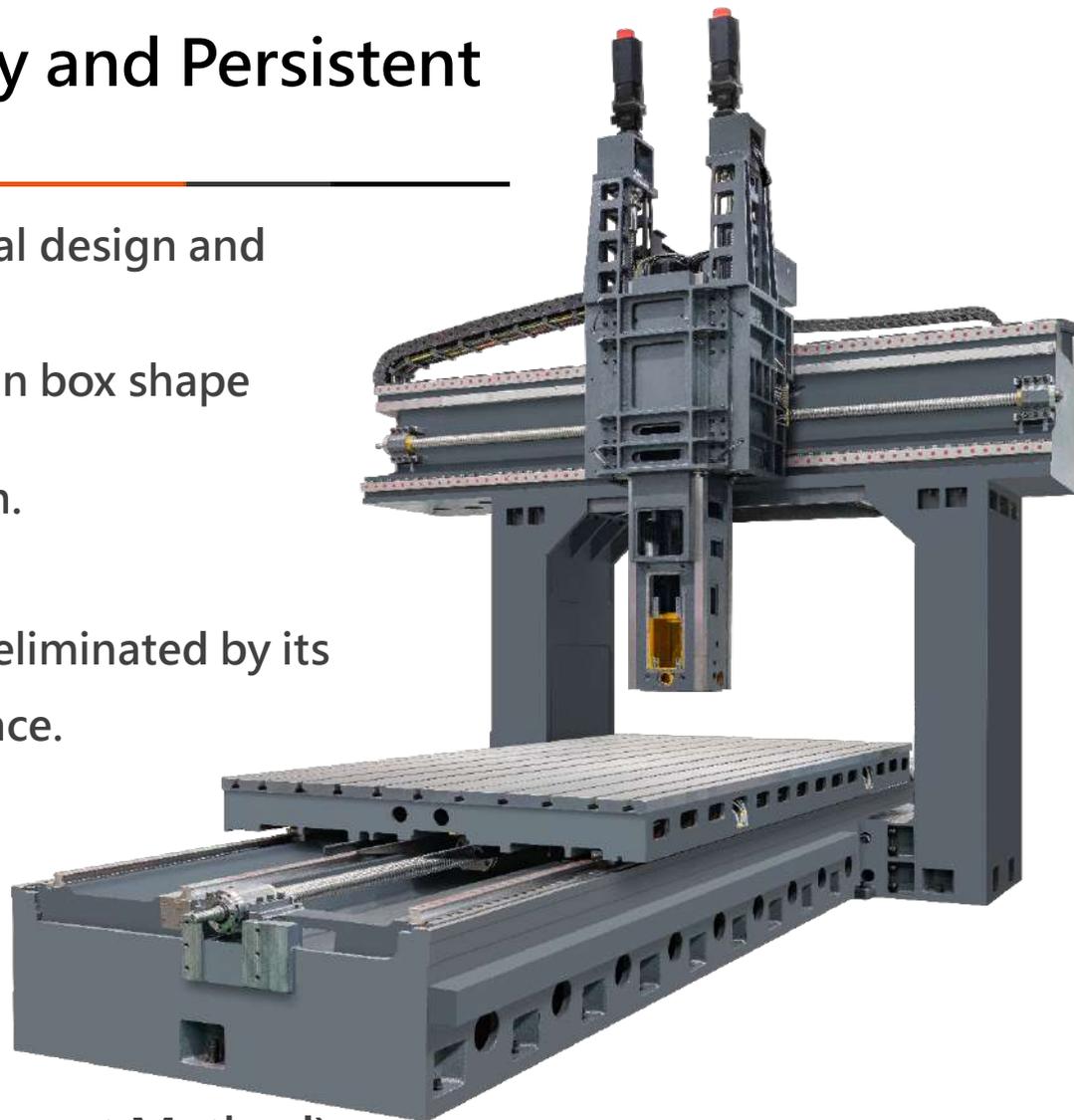
## High Rigid Mechanical Structure

## Meet the Best Rigidity and Persistent Accuracy

- Optimal streamline in structural design and stress-strain analysis.
- Symmetrical heat conduction in box shape structure.
- MEEHANITE grade casting iron.
- Stress relief heat treatment.
- Component machining stress eliminated by its natural frequency and resonance.

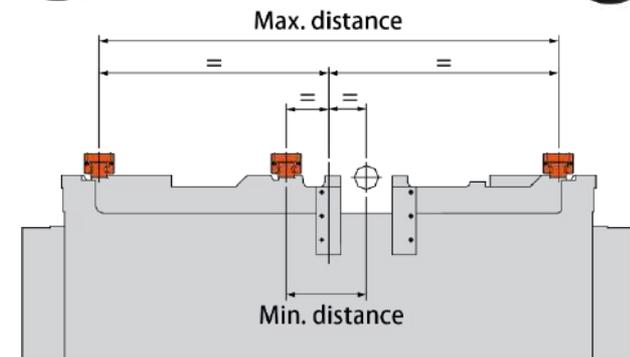


FEM (Finite Element Method)



## Meet the Best Rigidity and Persistent Accuracy

- X axis movements are fully supported by guide ways
  - Improving rigidity and reliability
- 3 roller type linear ways in X axis
- 30% stiffness higher than ball type roller guide way (HIWIN or SCNEEBERGER)
  - Improving the loading capability
  - Keeping high dynamic level accuracy
- Symmetric 3 roller type guide way
- High straightness in full stroke
- Effective ballscrew transmission and positioning
  - Best positioning
  - Loading balance
  - Longer lifetime



# Y-axis High-Precision Transmission

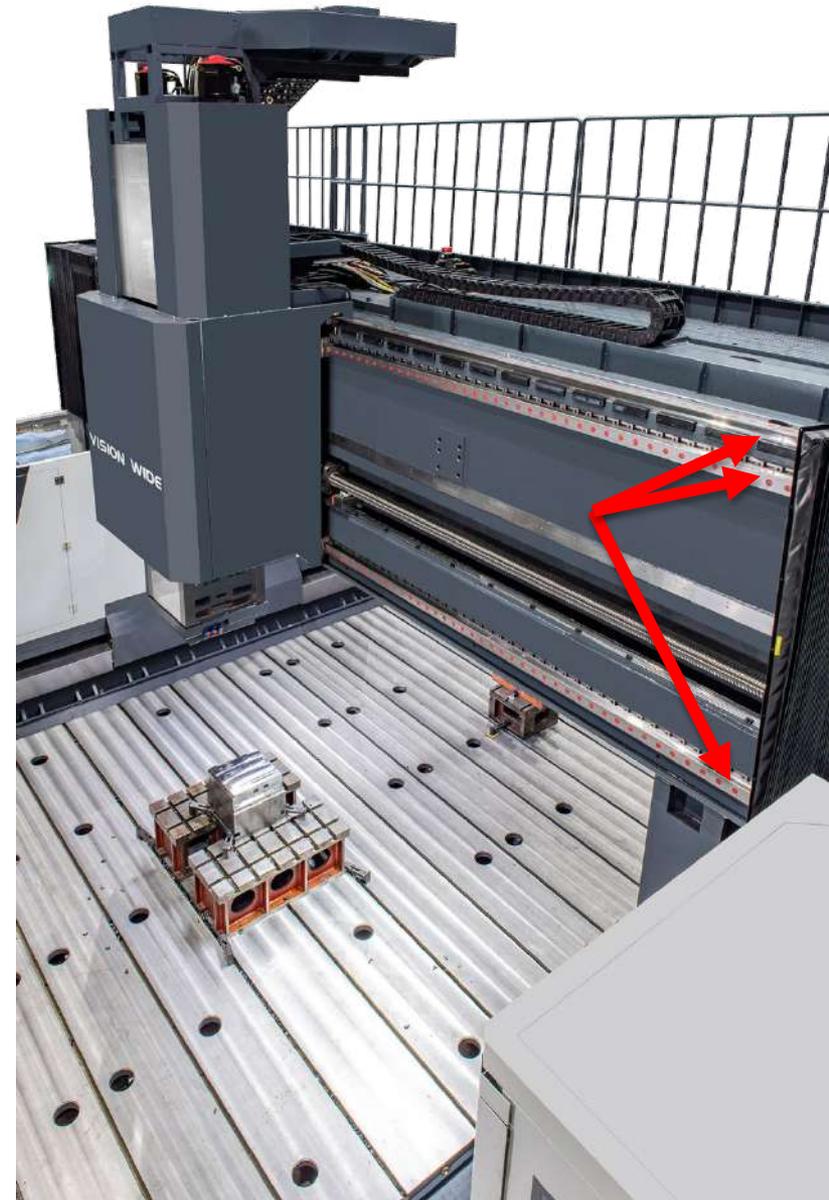


## High-precision realization

- Rapid feed 20 m/min
- Cutting feed 10 m/min
- Positioning accuracy P0.01 mm/2m
- Repeated accuracy Ps0.005 mm/2m
- Straightness 0.01 mm/2m

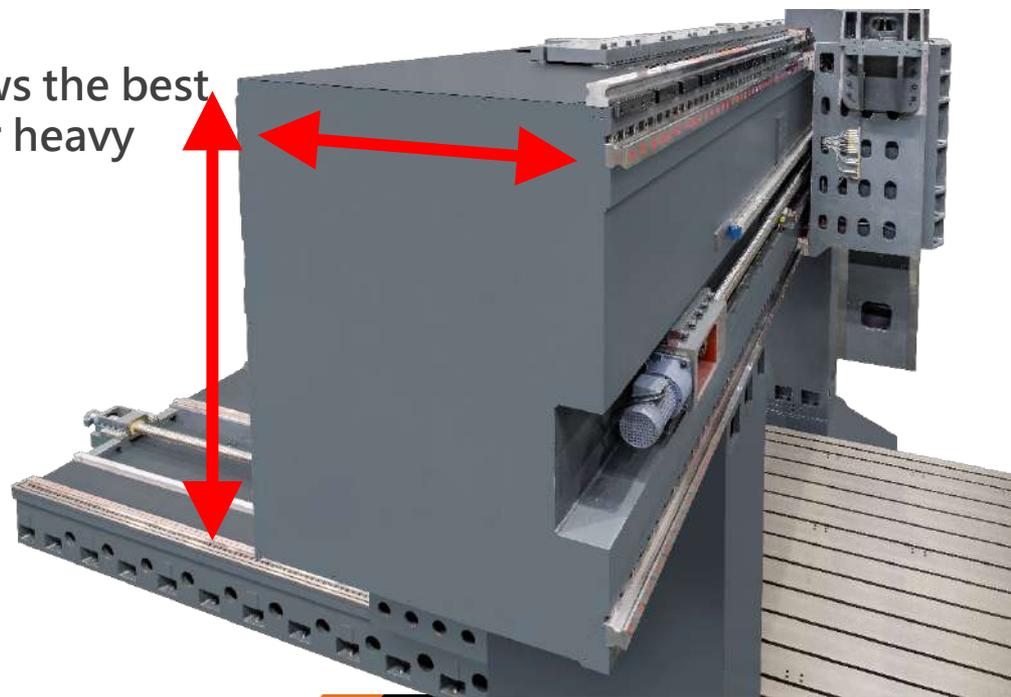
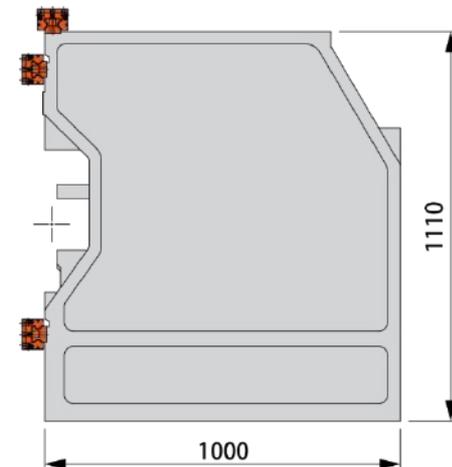
## High-straightness motion

- Big-span on guide way distance
- 3-roller type linear guide way to
- support big Z travel cutting resistance.



## Meet the Best Rigidity and Persistent Accuracy

- 1,100mm high rigid beam, with stepped design, and large span in Y axis for rigidity.
- 550x1,000mm large size column gives the beam a strong support.
- Base with strong V-shape ribs allows the best dynamic horizontal accuracy under heavy work piece load.



## DCG, Driving at the Center of Gravity design



**Rigid Box Way**



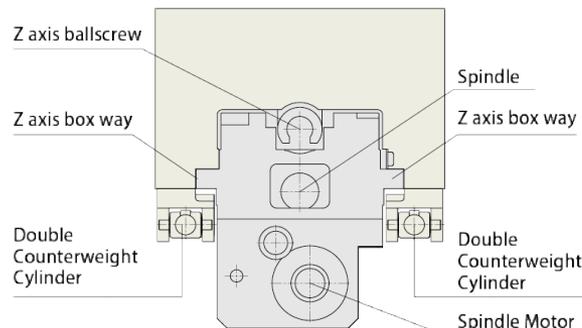
**High speed  
Linear Way**



**Super rigid-  
Enclosed Box Way**

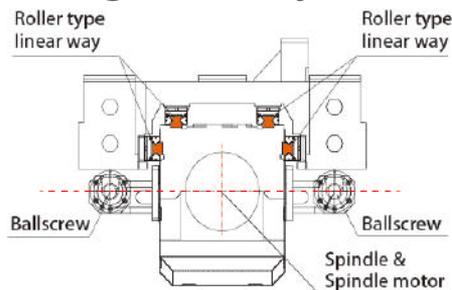
## Box Way (Single Ballscrew)

- **Symmetrical support at the Center of Gravity**
  - The guideway is closed to the spindle center to get the best cutting force support.
  - The spindle is balanced by two symmetrical counterbalances.
  - The spindle is located at the center of gravity of the Z axis.
- **High acceleration counterbalance driving**
  - Twin hydraulic cylinders with pressured Nitrogen assistance counterweight System to achieve high acceleration of the Z axis.
  - Pressured Nitrogen accumulators with isolated oil and N2 offer saving power and a long lifetime.



## Linear Way (Dual Ballscrews)

- **DCG, Driving at the Center of Gravity**
  - The spindle is located at the driving center which is the center of gravity of the Z axis.
  - Symmetrical guideway configuration at spindle center.
- **DPR, Dual Positioning Rigidity**
  - Dual ballscrews and servo motors driving.
  - The dual thrust bearing support.
  - Dual moving rigidity.
  - High acceleration.
  - Positioning accuracy increased by 50%



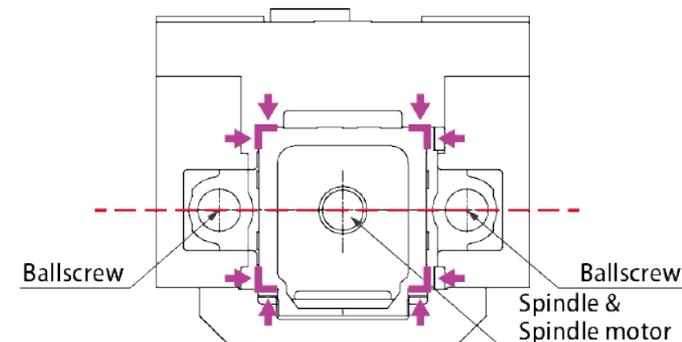
**Lowest friction for higher acceleration and high-speed machining and acceleration for Die and mold machining.**

## Enclosed Box Ram (Dual Ballscrews)

- DCG, Driving at the Center of Gravity
  - The spindle is located at the driving center which is the
  - center of gravity of the Z axis.
  - Symmetrical guideway configuration at spindle center.
- DPR, Dual Positioning Rigidity
  - Dual ballscrews and servo motors driving.
  - The dual thrust bearing support.
  - Dual moving rigidity.
  - High acceleration.
  - Positioning accuracy increased by 50%
- Four-sided constrain structure provider rigidity
- Lowest friction for higher acceleration and high-speed machining
- and acceleration for Die and mold machining.



The ram is supported with box way at 4 corners.

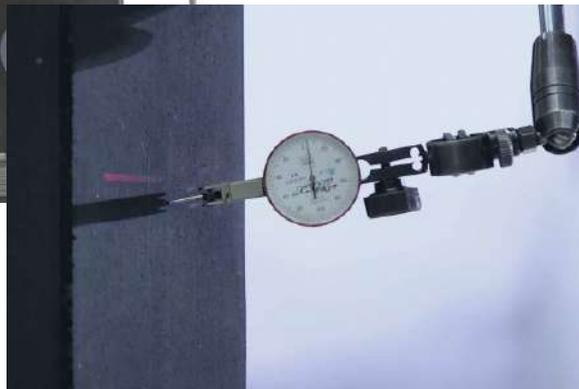


## Enclosed Box Ram (Dual Ballscrews)

- High rigidity ensure high accuracy cutting applications.
- XZ, YZ squareness accuracy : 0.01mm/1,000mm



Large holding span.



## Enclosed Box Ram (Dual Ballscrews)

Play at 2x speed



## Various Spindle

Gear type spindle



Direct-driven spindle



Built-in spindle



4,000 rpm

6,000 rpm

8,000 rpm

10,000 rpm

Spindle power=22/26kW

Speed=4,000rpm

Material=S45C(mid carbon steel)

### Face milling

tool dia.=125mm  
feed=1,000mm/min  
width=100mm  
depth=7.5mm  
removal rate=750cc/min

### End milling

tool dia.=63mm x9inserts  
speed=800rpm  
feed=400mm/min  
width=40mm  
depth=20mm

### Drilling

tool dia.=55mm  
speed=220rpm  
feed=60mm/min  
CTS

### U-drilling

tool dia.=80mm  
speed=880rpm  
feed=80mm/min  
CTS

### Tapping

tool dia.=M36mm  
speed=50rpm  
feed=200mm/min

$$\text{position} = \frac{1}{2} \times (\text{Z travel})$$

## Precise Spindle Transmission Mechanism



- Gear spindles are made from Japan-made JIS-0 grade.
- 2-step gear type spindle provides high torque and high speed characteristics to ensure heavy cutting ability on surface finish. Lower noise, Higher efficiency and Longer working life.
- Low speed: Heavy Cutting
- High Speed: Fine Cutting

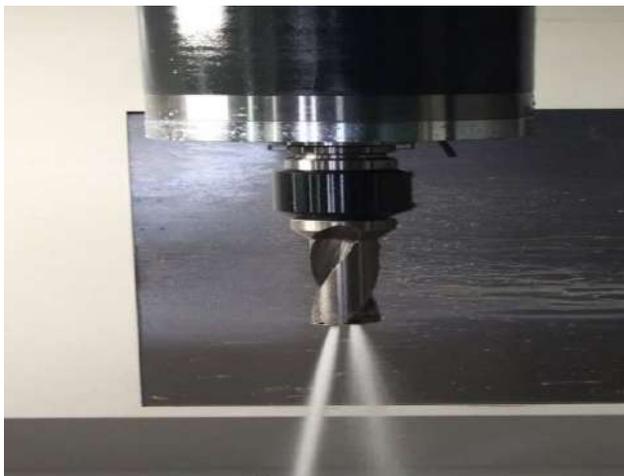


- Spindle oil cooling system
- Efficiently preventing thermal deformation.

## High Efficiency Cutting Cooling Device



- With ring & nozzle type flood coolant function.
- Thermal deformation of work piece and the used tool can be reduced significantly

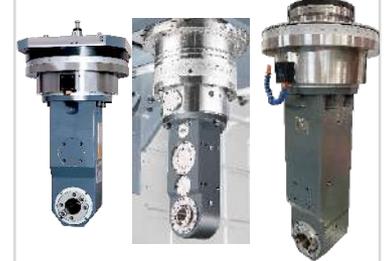


- Especially in drilling deep holes, though Coolant through-tool holder or high pressure coolant-through-spindle function, the chips and heat from machining can be removed more efficiently.
- Less residual chip, Suppressing thermal deformation, extending tool lifetime.



# Intelligent Multi-face Machining



**AC 2-axis head****AC 90° angular Head****AC90° spindle extension head  
L380 D140****AC extended head  
ACE-E300****AC Milling head  
H428/ H650 / H1060****High speed AC 2 axis head****AC90° angular head  
(Strong) – L258****AC90° spindle extension head  
L400 D265****AC extended head  
ACE-E381****AC Milling head  
W88 H557****Fork type swing head****AC90° angular head  
(Strong)– L380****AC90° spindle extension head  
L855 D116****Eccentric AC Milling head- W120 H735****Small AC90° milling head**

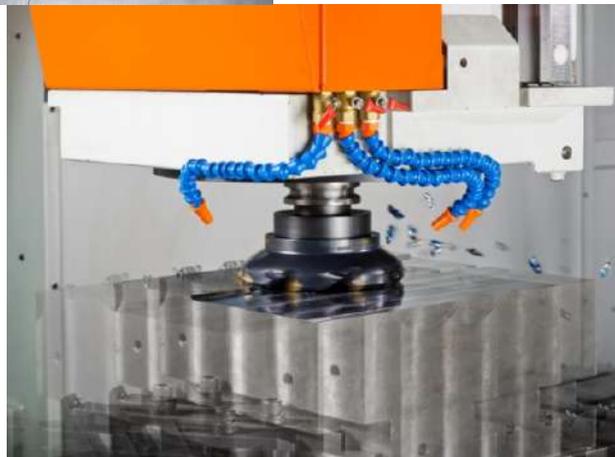
\*Provides over 50 attachment head SPEC. Please contact sales for more details.



***5-face Machining Application***

## Auto Vertical, Horizontal and Inclined Angle Machining

- Various types of automatic and manual attachment heads are provided to realize compound angle machining.



## Modular AC Head Interface for variety attachment

- B/C-axis auto 5° / 1° indexing
- C-axis auto 1° indexing
- Large diameter indexing mechanism
- Auto tool clamping device
- Flood coolant function
- Attachment head with coolant through spindle



## Multi-face Machining



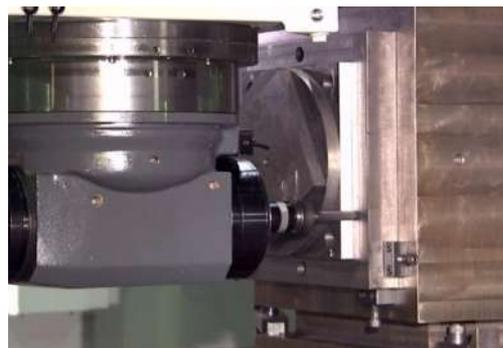
Milling  
spindle torque = 900Nm



Drilling  
AC 2-axis head



Boring  
AC90° spindle extension  
head

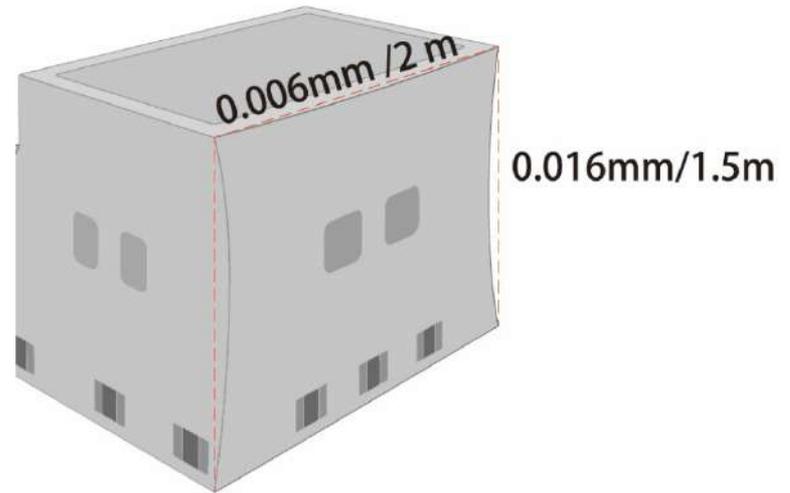
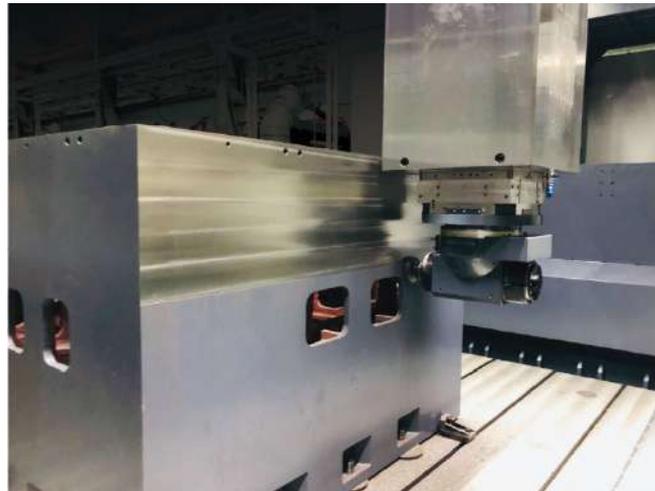
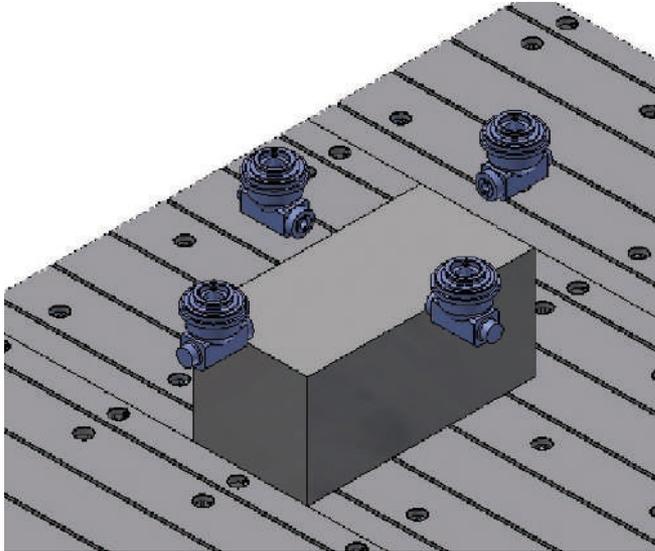


Milling  
Side circle cutting  
with AC 90° head



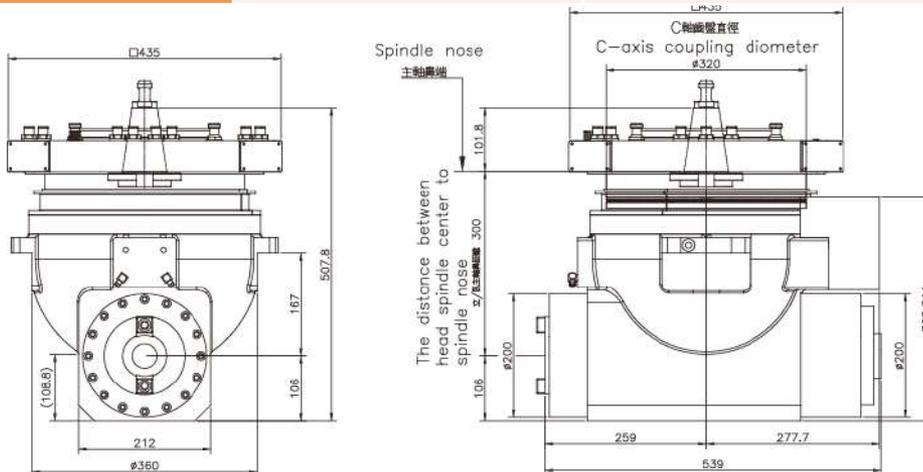
B axis auto 1° indexing  
compound machining

## High Geometry Accuracy Machining Performance



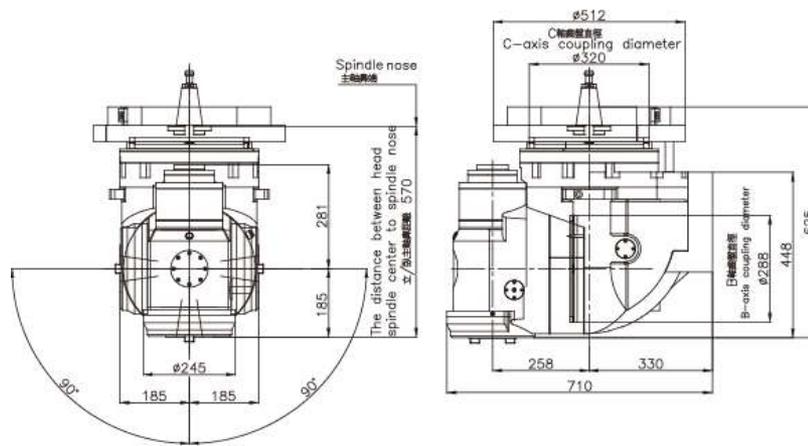
## AC 90° Angular Head

Item	AC 90° angular head	
	G2	G4
Max. speed	3,000rpm	5,000rpm
Max. power	26kW	
Tool clamping	Auto hydraulic clamping	
Head clamping	Auto hydraulic clamping	
C-axis indexing	Auto 1°/5°	Auto 1° / 2.5° / 5°
Machining coolant	External nozzle	External nozzle
Coolant Through Spindle(opt.)	20 bar./70 bar.	20 bar./70 bar.



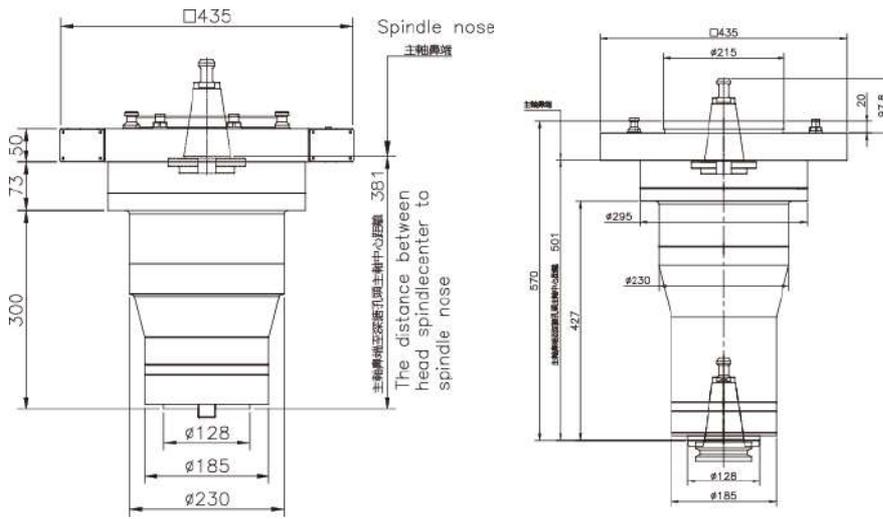
## AC 2-axis Head

Item	AC 2-axis head	
	G2	G4
Max. speed	3000rpm	5000rpm
Max. power	26kW	
Tool clamping	Auto hydraulic clamping	
Head clamping	Auto hydraulic clamping	
C-axis indexing	Auto 1°/5°	Auto 1° / 2.5° / 5°
B-axis indexing	Auto 5° Manual 1°/5°	Auto 1° / 2.5° / 5°
Machining coolant	External nozzle	Spindle nose ring cutting coolant system
Coolant Through Spindle(opt.)	20 bar./70 bar.	20 bar./70 bar.



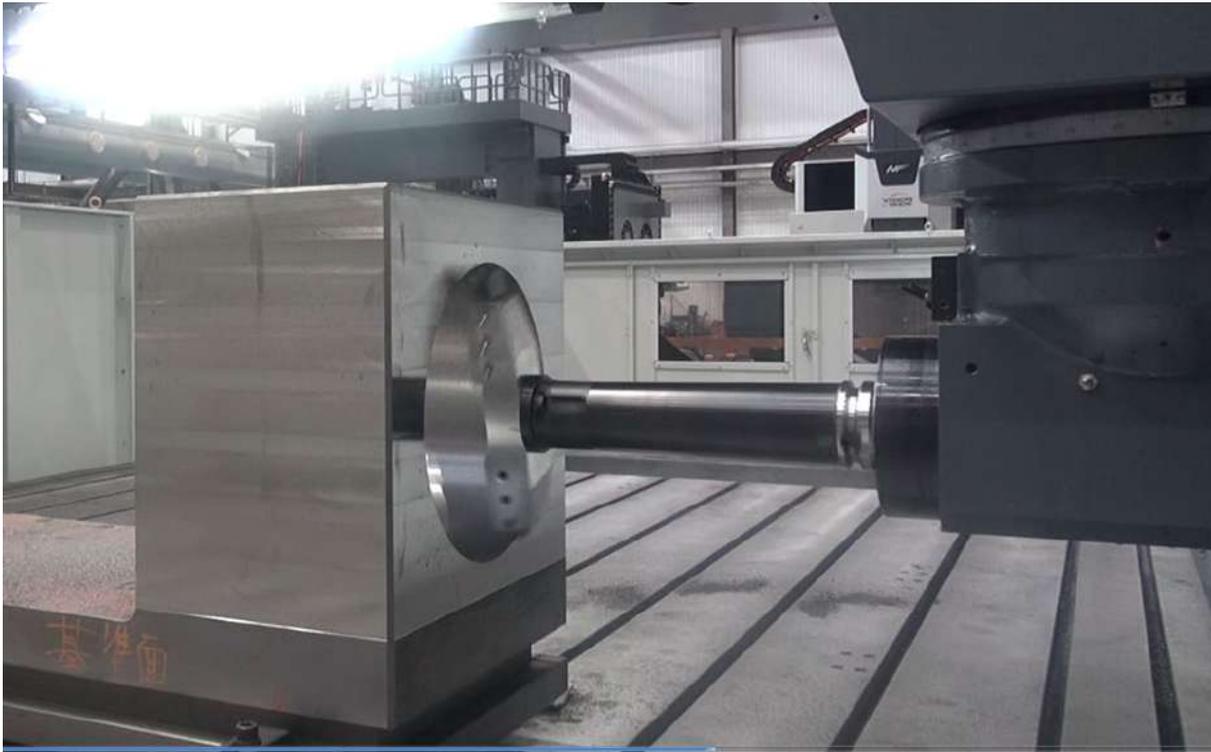
## AC Extended Head(300/420mm)

Item	AC extended head 300mm		AC extended head 420mm	
	G2	G4	G2	G4
Max. speed	4000rpm	5000rpm	4000rpm	5000rpm
Max. power	26kW			
Tool clamping	Auto hydraulic clamping			
Head clamping	Auto hydraulic clamping			
Coolant Through Spindle(opt.)	20 bar./70 bar.	20 bar./50 bar.	20 bar./70 bar.	20 bar./50 bar.



# Exclusive Configuration for Deep Cavity Precision Boring Machining

- Power AC90 Head
  - For Heavy duty head with Big Dia. Boring
- 



# Exclusive Configuration for Deep Cavity Precision Boring Machining

- Extend AC90° Head
- Long nose instead of long boring tools

Extend shaft





AC90 H428

AC90 H535

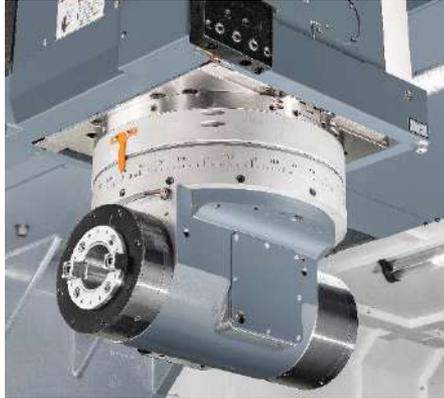
AC90 H658

AC90 H720

AC90 SH735

AC90 H1060

\*Provides over 50 attachment head SPEC. Please contact sales for more details.



**AC90 L258**



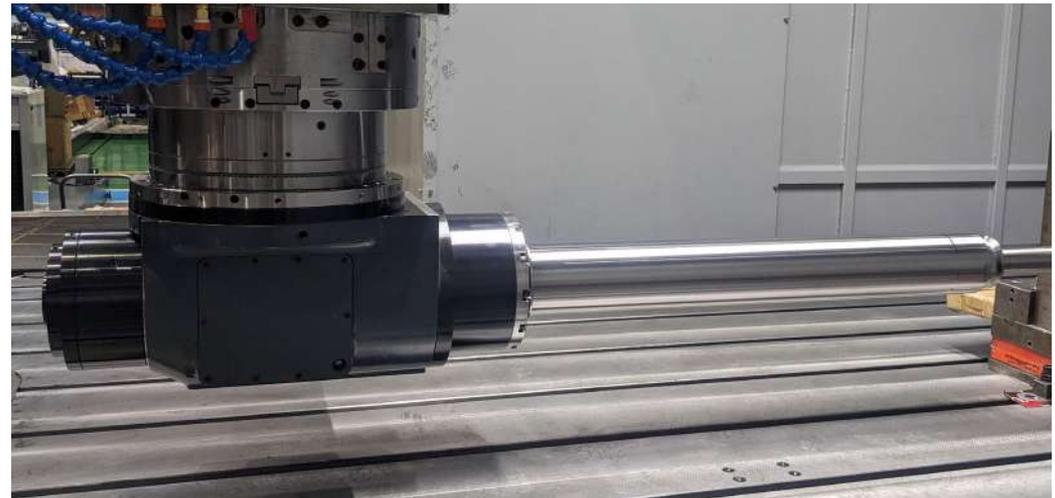
**AC90 L380**



**AC90-L380E265**



**AC90 L658**



**AC90 L855**

\*Provides over 50 attachment head SPEC. Please contact sales for more details.

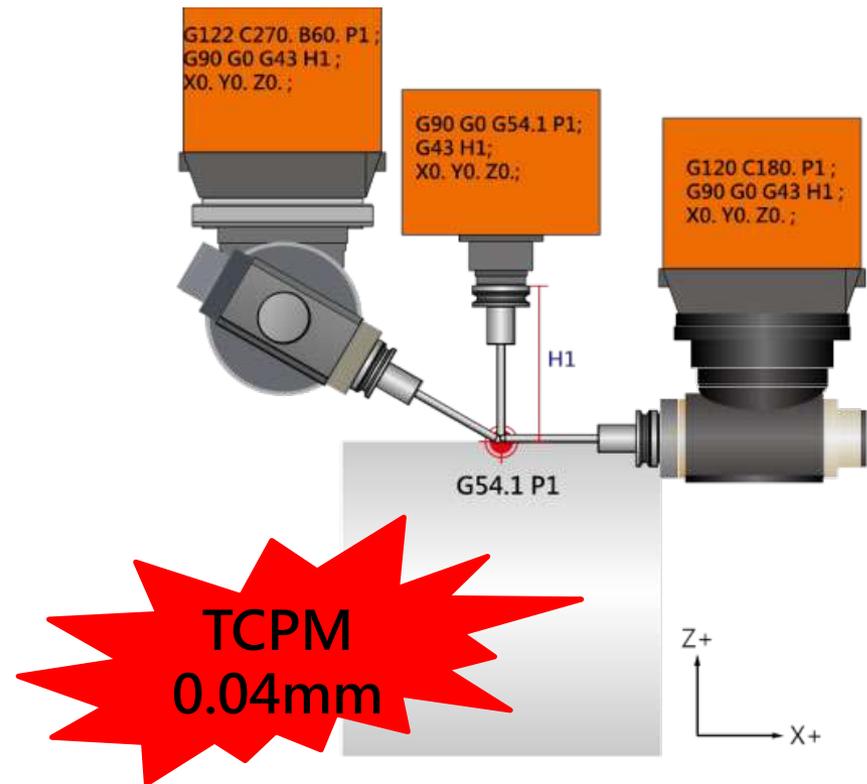
## Small Cavity Machining



\*Provides over 50 attachment head SPEC. Please contact sales for more details.

## TCPM, Tool Center Point Management

- By One G command (G120/G122)
- Head dimension compensation
- 3D coordination rotation
- Auto tool length compensation
- Workpiece coordination offset
- Head ID identification



## Intelligent Multi-face Machining

### 5-axis Level Tool Point Center Management TCPM

- Each type of head attachment with tool center point management, takes vertical workpiece as origin benchmark, and converts the workpiece coordinates to any new specified plane of workpiece coordinates automatically.

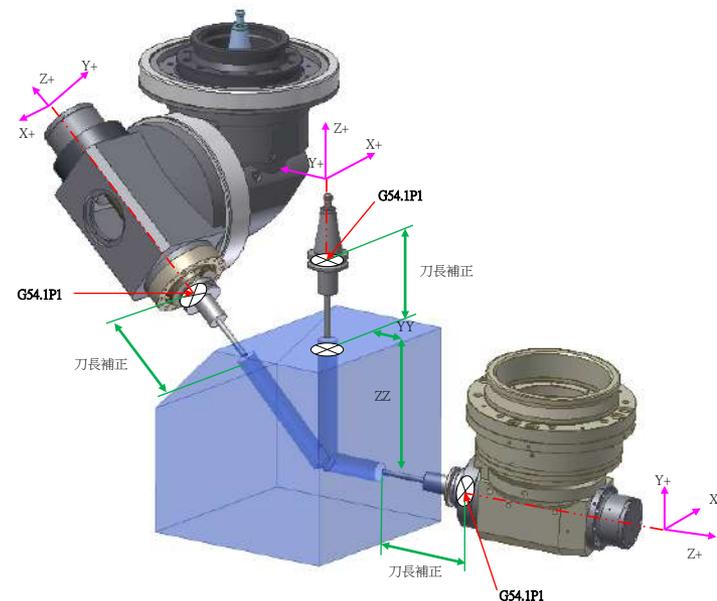
G120  
G54.1 P1  
...  
G120 C0 P1 X0. YY ZZ

### Auto Coordinates Tool axis 3D Conversion

- 3 axis mechanical coordinates system can be automatically converted to machining coordinates system, easily achieving face milling, end milling, drilling and rigid tapping machining operations in different directions.

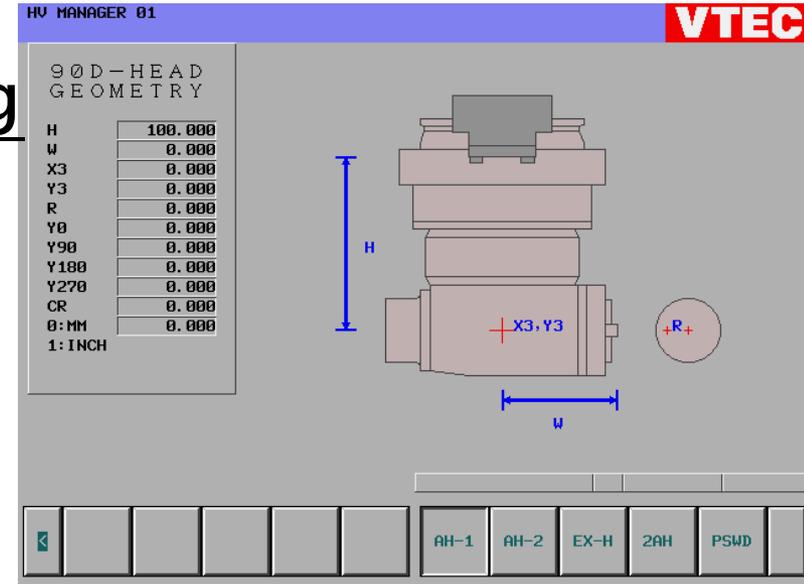
### Head Attachment Dimensions Correction

- Intelligent compensation on each type of head attachments. The compensation including rotation center, tool size, workpiece coordinates system correction management. It greatly simplifies the complexity of programming and operation to achieve perfect auto multi-angle machining.



## Auto AC Head Compensating

- 5 axis machine class TCPM management.
- Auto compensating attachment heads:
  - Auto compensating horizontal head center and spindle center
  - Auto compensating mechanism mass center and revolution center
- 3D coordinates management:
  - V/H tool length and diameter compensation
  - V/H working coordinate affine transformation



## Attachment Magazine



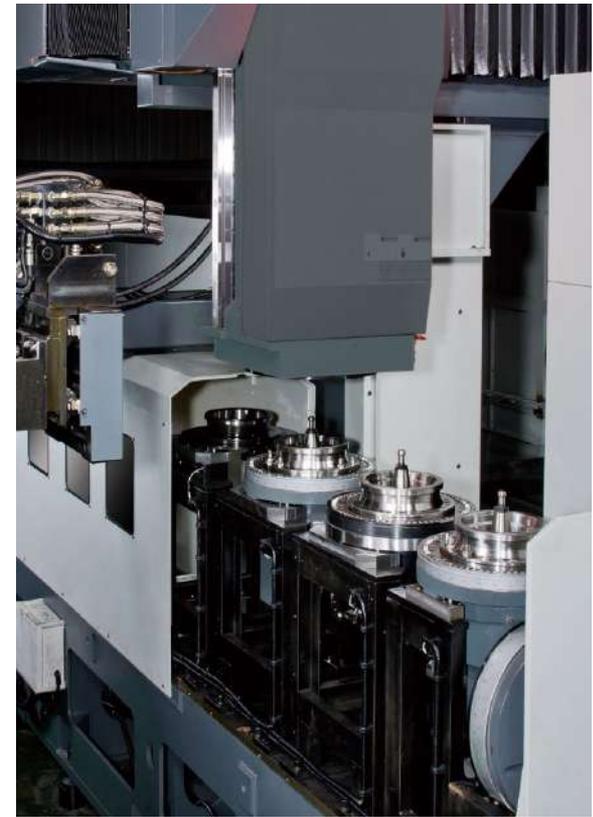
- Table type head bracket ( one head attachment, one cover )



- Manual swiveling arm type head bracket on operation side ( one head attachment)



- Auto swiveling arm type head bracket on operation side ( one head attachment, one cover )

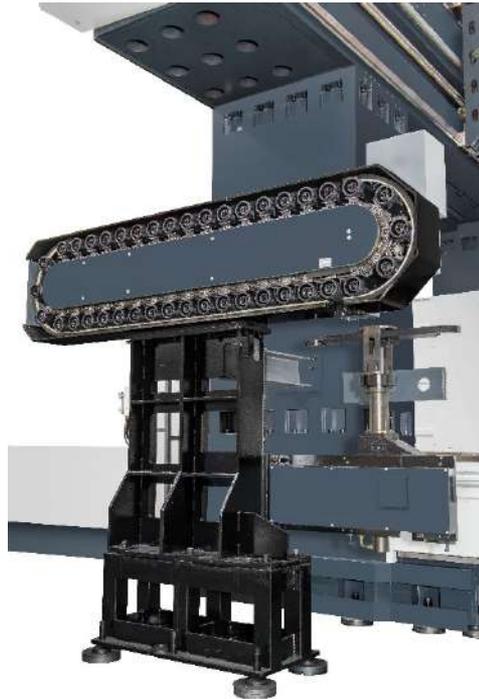


- Milt head auto head magazine (for HF-xx42/47 series)

## Auto Tool Magazine



- Vertical type tool magazine (for HF-xx35/40 series)



- Floor-standing vertical type tool magazine (for HF-xx42/47 series)



- Floor-standing vertical-horizontal type tool magazine (for HF-xx42/47 series)

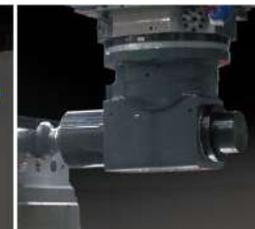
## Achieve Automatic 5-face Machining Applications



- Provides over 50 attachment head SPEC.

Auto attachment Magazine

Auto Vertical-Horizontal tool change





# Friendly Operation Interface And Accessories

## Provide Operators with a Easy and Safety Operating Environment

---

- A hanged and swivel able operation panel.
- A movable manual pulse generator.
- Soft key panel with friendly interface.
- To let users being in an easy-measuring 、 easy-programming 、 safe working enviro.



Standard type  
operation panel

### Controller

Standard:

- FANUC : 0iMF Plus

Option:

- FANUC : 31iB
- HEIDENHAIN TNC 640
- SIEMENS 828D / ONE
- MITSUBISHI M80 Type A / M830



### CNC TalkBox

- Expandable industrial monitoring equipment, support multi-brand controllers, wireless transmission.
- Data transmission, accurate recording automatic real-time monitoring, downloading machine status, capacity data, master the production rhythm and equipment performance.



- ✓ Remote monitoring
- ✓ Not restricted by geography
- ✓ Ready to transfer
- ✓ Understand the abnormal situation at the first time

## CNC TalkBox (Standard)

### Economic

- Small hardware devices for rapid introduction of industrial Internet of Things(IoT)

### Stable

- Timely record of production log is a benefit to analyze process and increase production capacity.

### Expandable

- Complete data collection can make better decisions for process, dispatch, tool and material magazine.



### Standard:

- ✓ Machine Monitoring
- ✓ Machine management
- ✓ NC program management

### Option:

- ✓ Production History  
Monitoring
- ✓ Machine Production Analysis
- ✓ Statistical Report

## CNC TalkBox



User Management



Production History Monitoring



Production History Monitoring



Machine Monitoring



Statistical Report



Machine Management

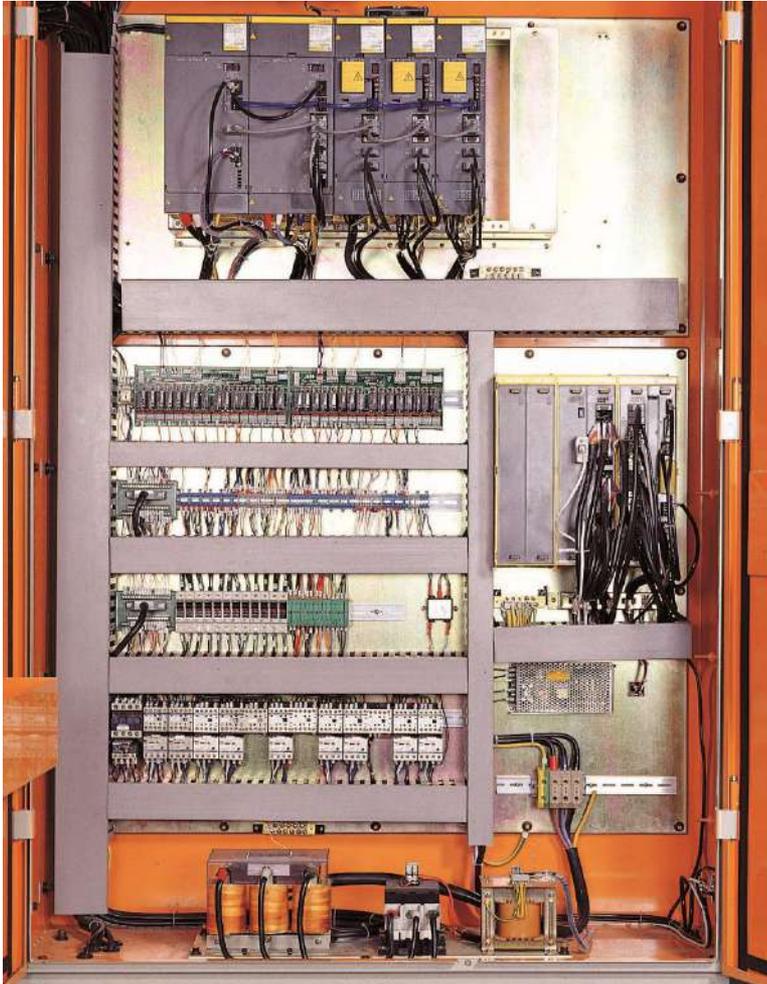


Machine Production Analysis



NC program Management

## CE Certification with Dual Circuit Design



Dual circuit design  
for safety

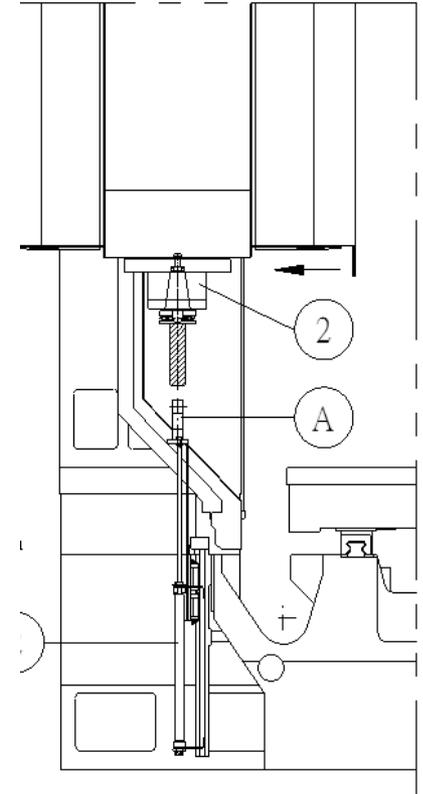


Safety for  
switching door



## Smart Automatic Tool Length Measurement

- Quickly measure tool length and diameter after tool changing.
- The device is independent from working area.
- Repeatability accuracy  $<0.005\text{mm}$



**For more information,  
please contact us.**



**TEL 886-49-233-8888 FAX 886-49-233-0083**

**info@visionwide.com.tw**

**http://www.visionwide-tech.com**



**Web**



**WeChat**