

# VF1290 series double column high speed machine



Version No.: TRJG-2016-A1



**"VF" means "double column high speed machine"**

**"12" means "X axis travel 1200mm"**

**"90" means "distance between columns 920mm"**

**VF1290 standard direct driven spindle  
15000rpm ;**

**VF1290A standard electric spindle  
24000rpm ;**

**VF1290B standard electric spindle  
36000rpm.**

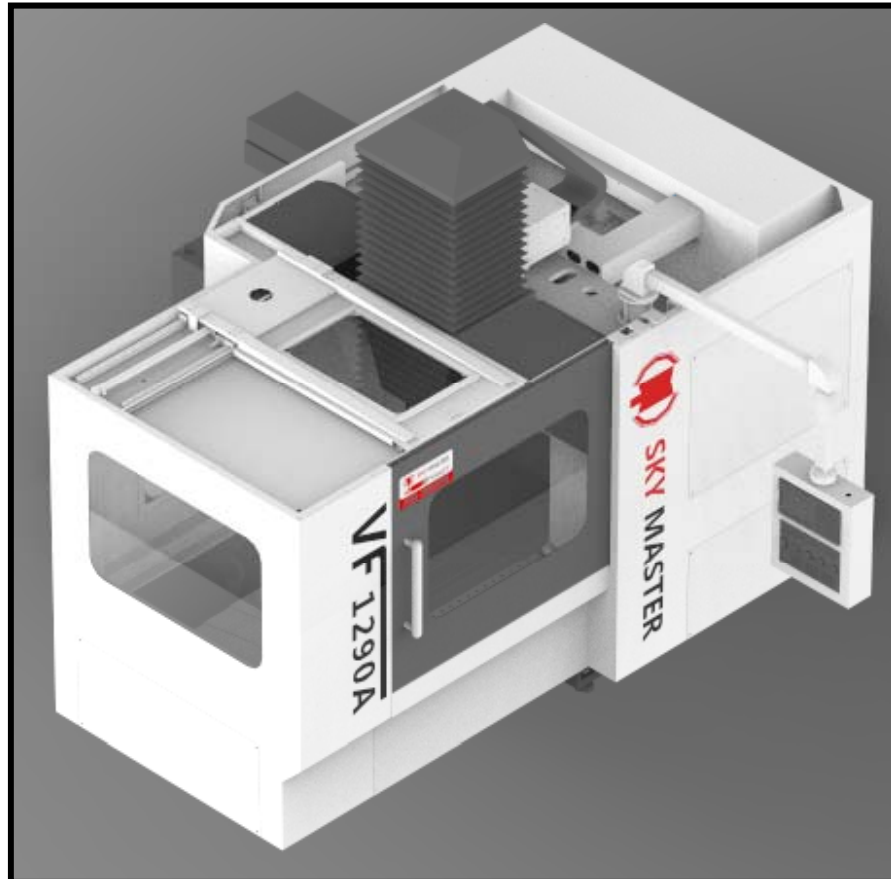
**Sky Master-Kraft  
China-Germany  
Investment**

# Technical Parameter

Item		Unit	VF1290	VF1290A	VF1290B
Standard controller			<b>FANUC 0i MF</b>	<b>Mitsubishi M730VW ( Heidenhain TNC620 )</b>	
Travel	X axis travel ( work-table )	mm	1200	1200	1200
	Y axis travel ( saddle )	mm	800	800	800
	Z axis travel ( spindle head )	mm	550	550	550
	Distance from spindle nose to table	mm	150-700	150-700	150-700
	Distance between columns	mm	920	920	920
Work table	Table size (length×width)	mm	1320×800	1320×800	1320×800
	Max. table load	kg	2000	2000	2000
	T slot size ( width×distance×quantity )	mm	14×120×7	14×120×7	14×120×7
Spindle	Spindle taper		<b>HSK-A63</b>	<b>HSK-A63</b>	<b>HSK-E50</b>
	Max. spindle speed	rpm	<b>15000 ( direct driven )</b>	<b>24000 ( build-in )</b>	<b>36000 ( build-in )</b>
	Spindle motor power ( continual working/30mins )	kW	<b>7.5/11</b>	<b>30/39</b>	<b>20/26</b>
	Spindle torque	N.m	<b>47.7/70</b>	<b>29.1/37.8</b>	<b>10.4/13.5</b>
X/Y/Z	Rapid traverse (X/Y/Z)	mm/min	30000	40000	40000
	Cutting feed rate (X/Y/Z)	mm/min	1-10000	1-20000	1-20000
ATC (option)	ATC type		Drum type	Drum type	Drum type
	Tool capacity	pcs	20	20	24
	Max. tool diameter	mm	φ100/φ130	φ100/φ130	φ80/φ130
	Max. tool length	mm	300	300	220
	Max. tool weight	kg	8	8	4
Accuracy	VDI/DGQ344 1	Full travel positioning accuracy	mm	P0.014	P0.014
		Repeatability accuracy	mm	Ps0.008	Ps0.008
Air pressure		MPa	0.6-0.8	0.6-0.8	0.6-0.8
Supply voltage & frequency			3 /PE , AC380V , 50Hz	3 /PE , AC380V , 50Hz	3 /PE , AC380V , 50Hz
Power requirement		kVA	30	80	80
Machine size (length/width/height)		mm	5026×4276×3210	5026×4276×3210	5026×4276×3210
Machine weight		kg	12000	12000	12000

※ We reserve the right to change technical parameter for improvement of our products without giving notice to customers.

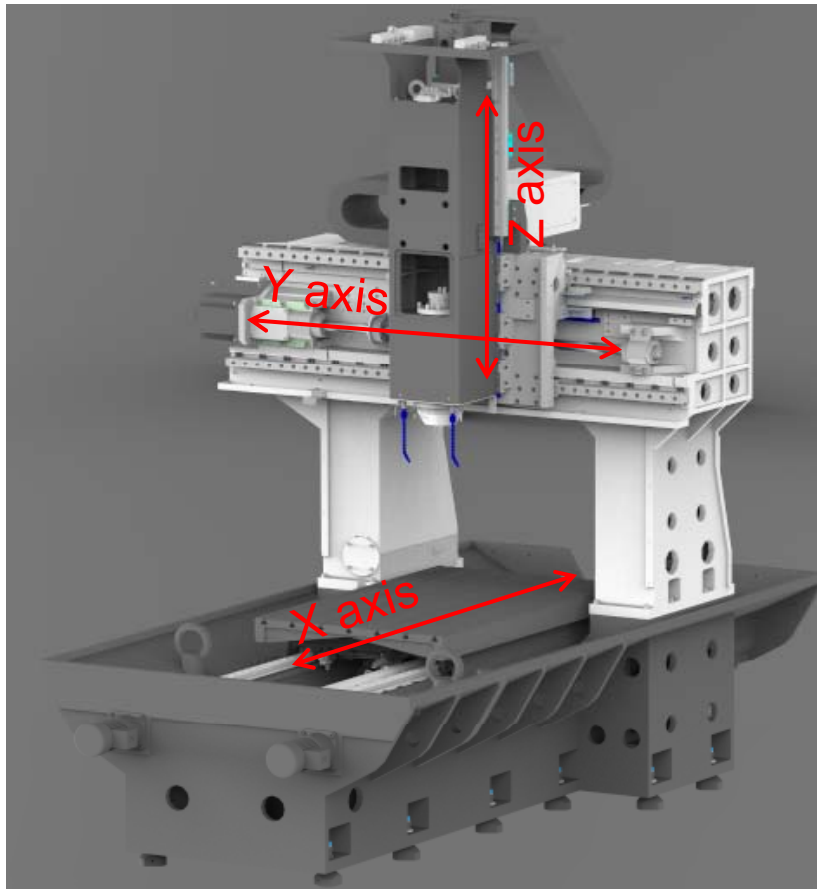
## Machine feature – Whole machine



Mainly use for machining high precision mould or non ferrous metal high speed machining, fulfill the concept of the high speed Machining center :

- ◆ High Rotate Speed—**direct connected spindle 15000rpm , build in spindle 24000rpm/36000rpm**
- ◆ High Feeding Speed—maximum cutting speed **20m/min**
- ◆ Fast Reaction—all three axes equip with large torque servo motor, the maximum acceleration can reach 1.2G, the X-axis' s acceleration can reach 0.9G when under 2 tons of load.
- ◆ High accuracy—all three axe's position accuracy is **0.008mm** , the repeat accuracy is **0.006mm**

# Machine Structure -Frame



Worktable movement in left and right ---X axis  
 Saddle movement in front and back -----Y axis  
 Spindle movement in up and down ---Z axis

- ◆ Use cross-shaped saddle in VMC structure
- ◆ One-piece integrated die-cast iron column with invert 'Y' shape
- ◆ Reasonable arrangement for whole machine ,convenient operation
- ◆ Easy to handle with chip remove and drainage

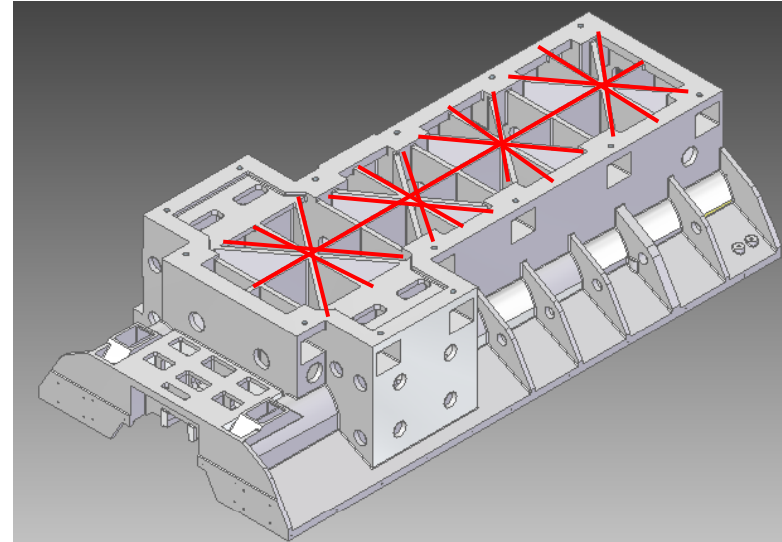
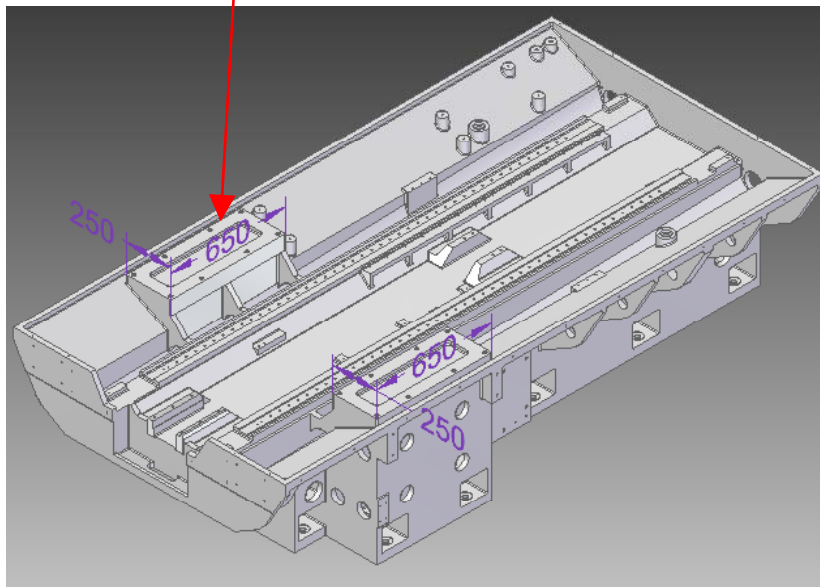
★The casting material is from Germany with unique composition ratio ,which is **30% higher than domestic cost**

★ Every casting part have a test bar which can analyze the real material character

★ FEM analysis to optimize the rigidity for machine

## Structure feature – machine bed

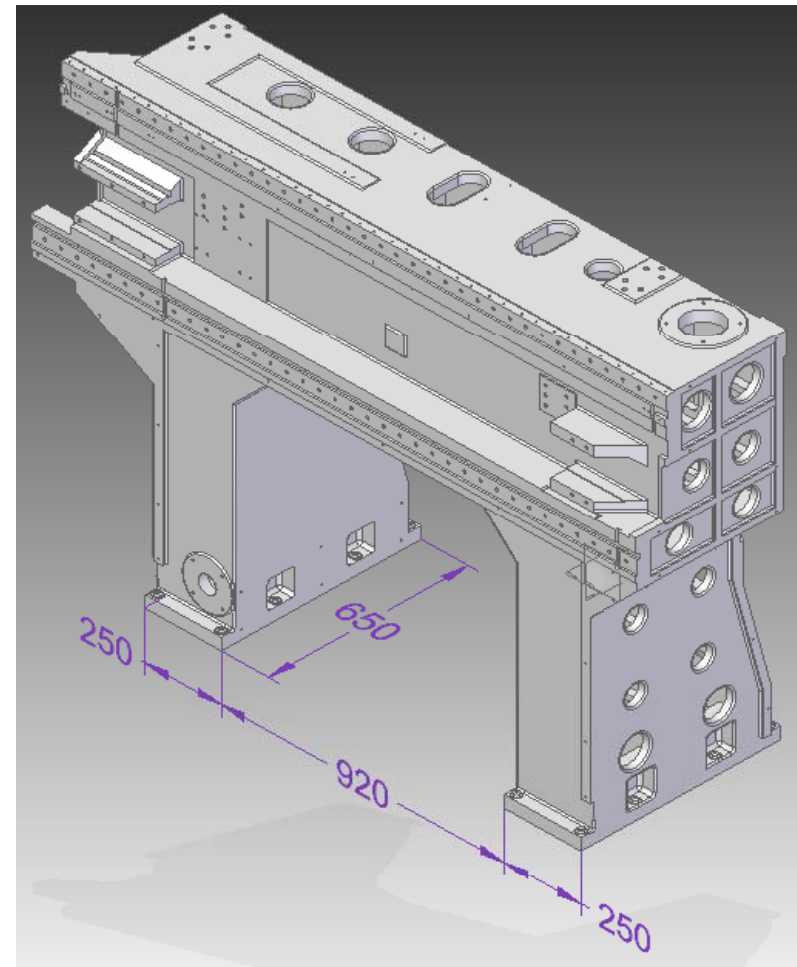
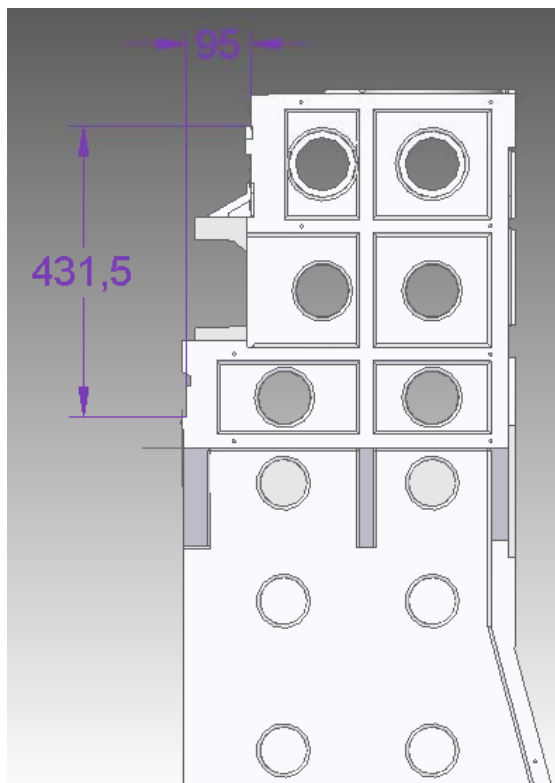
The large connect surface between bed and column which enhance the whole machine's stability



The machine bed use cross type rib design. The, it provide good stability and deformation ability

## Structure feature-Beam

The pathway of the Y-axis use multistep layout, with reasonable distance design provides good cutting force

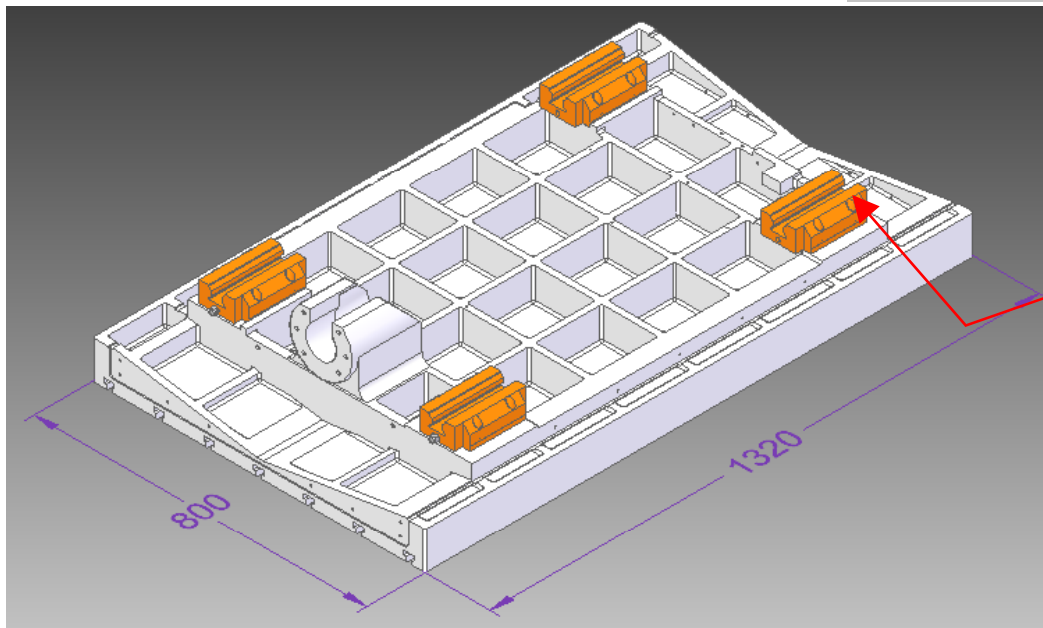
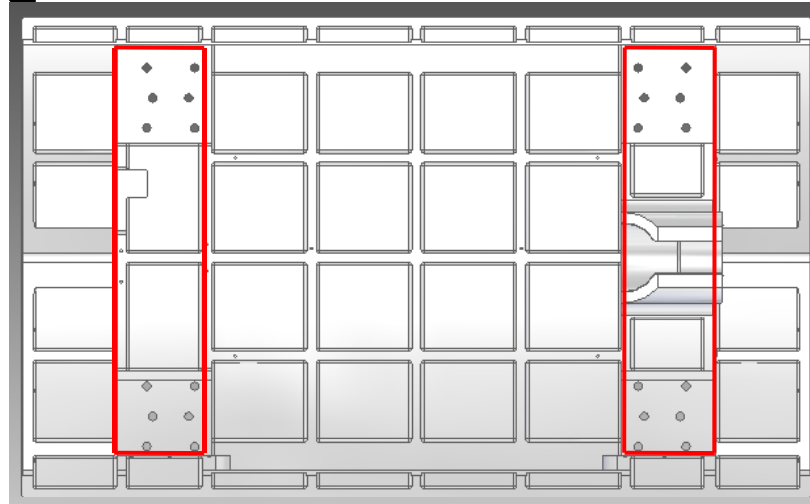


The beam and the column of the machine casted into one piece, this design provides good anti-vibration ability, increase stability under high speed cutting.

## Structure feature –Work table

★ Worktable' s weight shedding design, makes the work table 50kg lighter than other brands, increase the dynamic performance of the machine

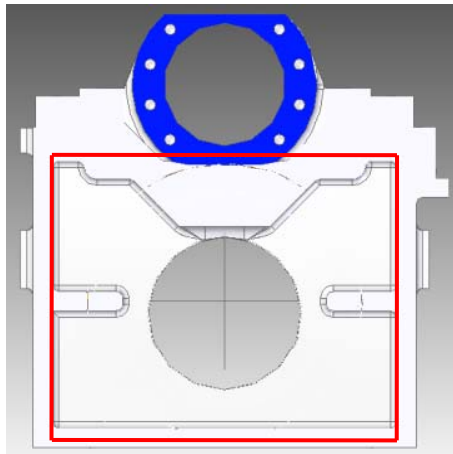
★ there are rectangular shaped strengthen rib between the slide block , provide the best rigidity and stability



There are 4 heavy duty, extended slide block working for the X-axis. Each slide block can take 119kN of load, ensure the worktable has good loading performance

## Structure feature- Spindle head

- ◆ The spindle head structure is from Germany Kraft craft and design experience combines with FEM to ensure the rigidity .
- ◆ Max spindle speed : 15000rpm, 24000rpm, 36000rpm , meet customer a variety of options ;
- ◆ The spindle head is designed in thin-wall(15mm thickness only) but with many enhance ribs, compare with other factory, this light-weight design can save 50kgs and as well as the dynamic improvement.

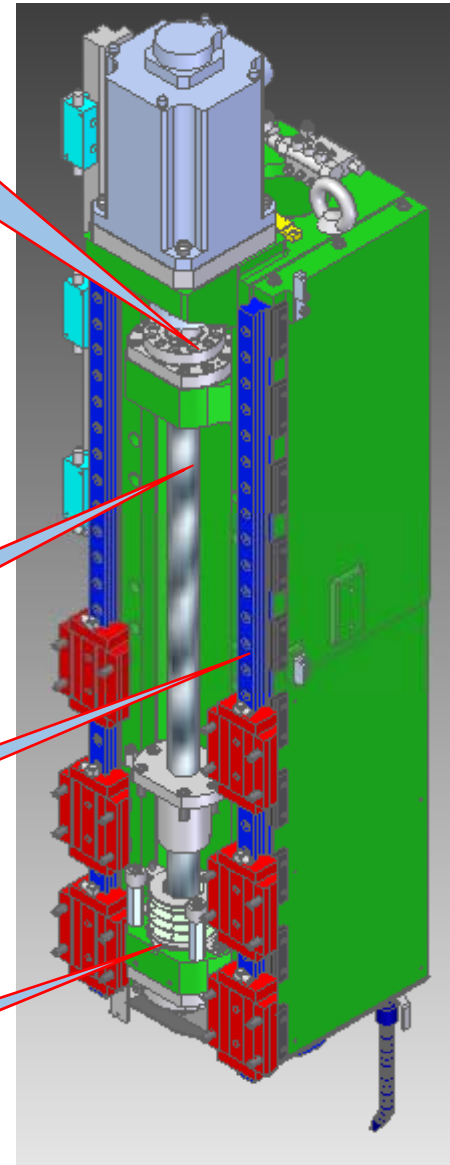


Z-axis bearing base

Z axis ball screw unit

Z axis guide way unit

Z axis rear base

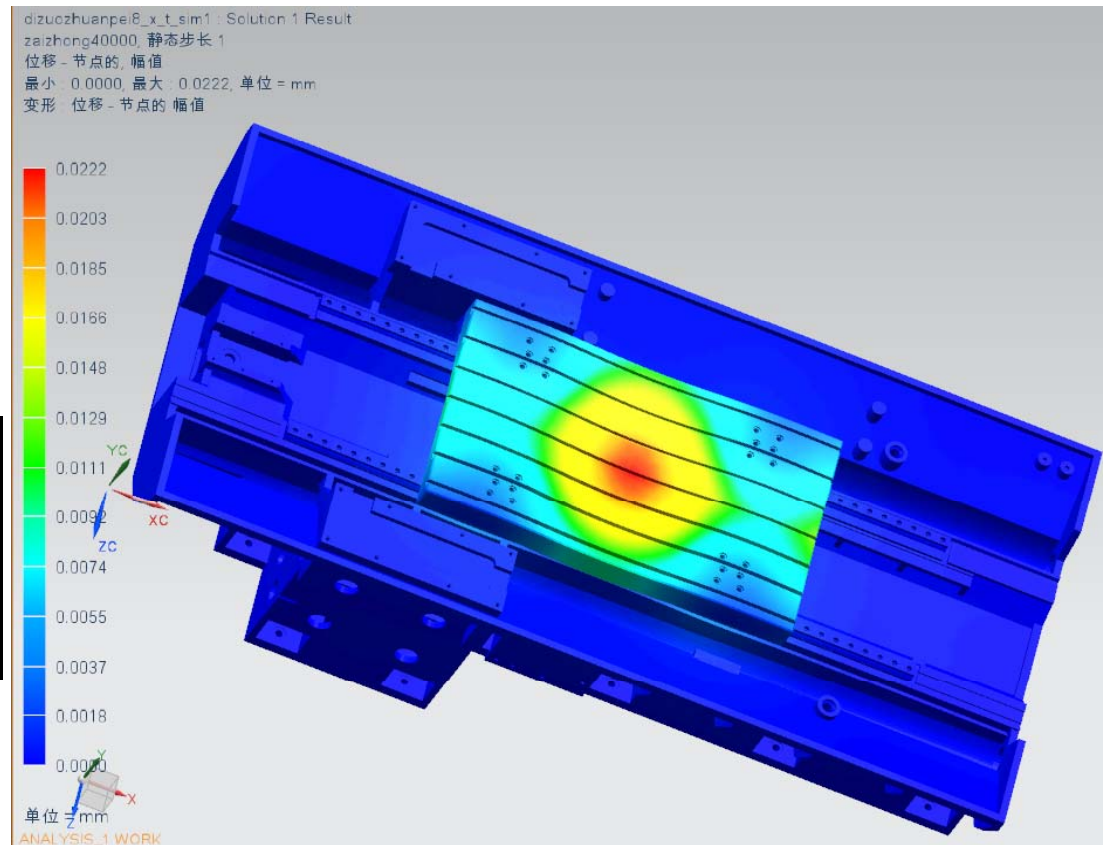




# Analysis and optimization

## Worktable stress analysis diagram

	Rated	Test
Loading	2T	4T
Deformation	< <b>0.012mm</b>	< <b>0.023mm</b>

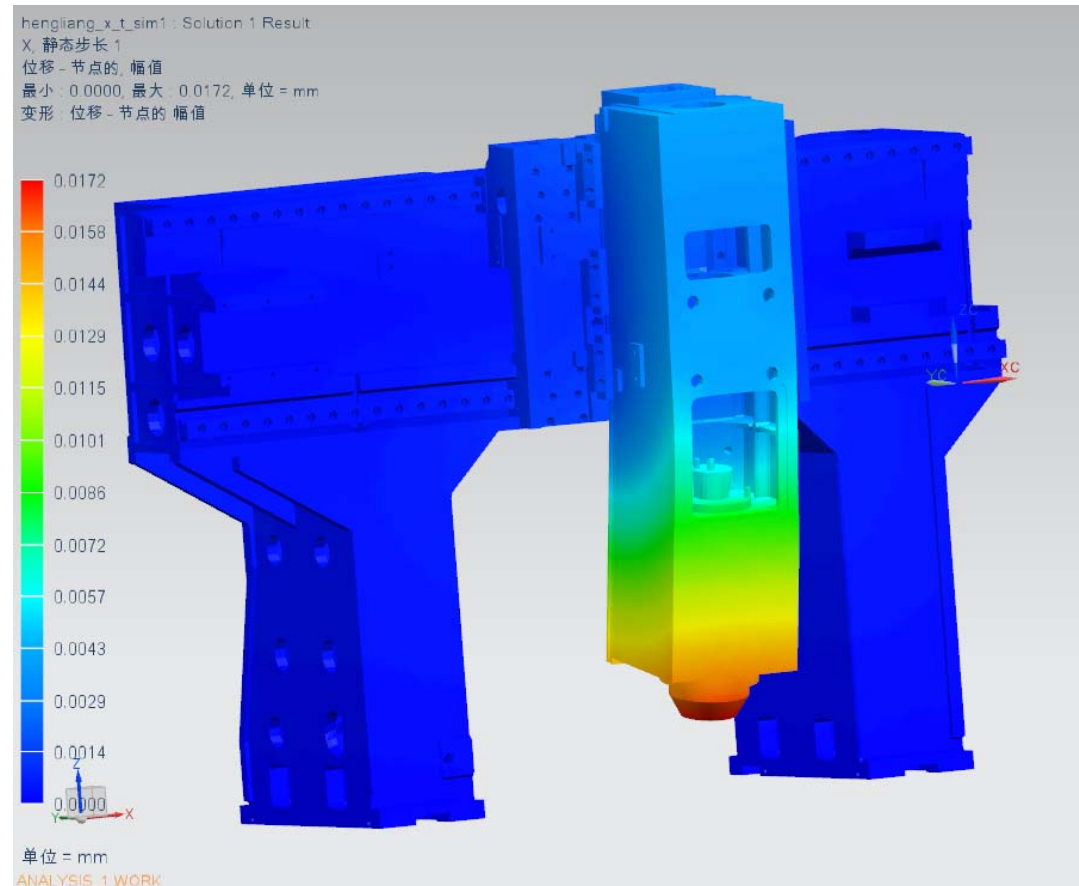


# Analysis and optimization

## -Beam, spindle head stress analysis diagram

**Analysis condition :**  
Spindle head move to the top,  
Stress at the side of spindle

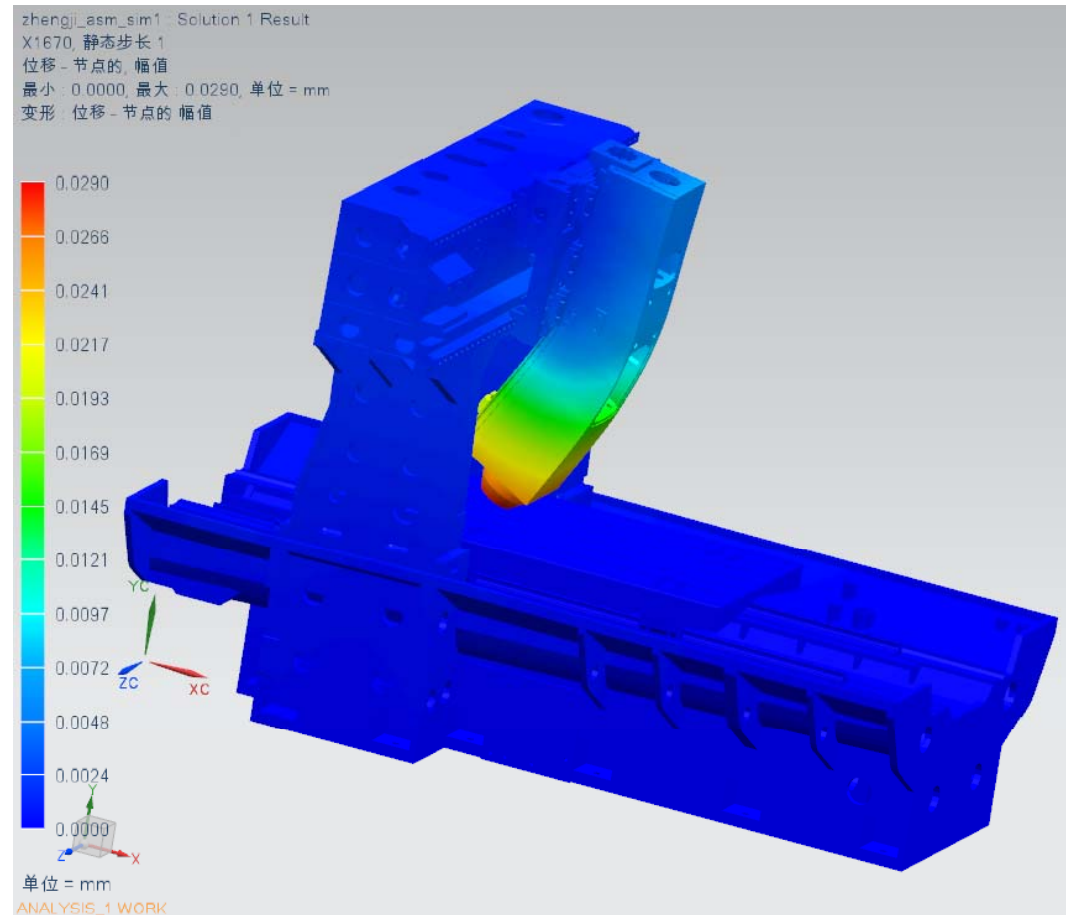
	Rated	Test
Loading	279kgf	500kgf
Deformation	< <b>0.010mm</b>	< <b>0.018mm</b>



# Analysis and optimization -whole machine stress analysis diagram

**Analysis condition :**  
4 ton load on the worktable  
Spindle head at the lowest  
position  
Add force to the side of the  
spindle

	Rated	Test
Loading	279kgf	500kgf
Deformation	<b>0.013mm</b>	0.029mm



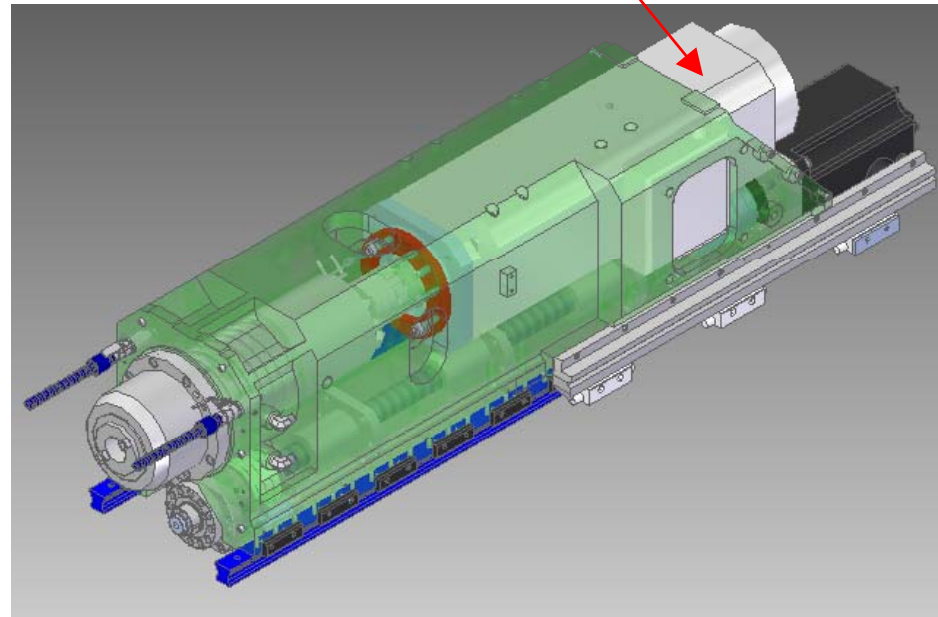
## USA SETCO Direct driven spindle

★ American SETCO is a company focus on designing and manufacturing high performance and high precision spindle.

★ The maximum rotate speed is 15000rpm, the spindle use ceramic rolling parts and grease lubrication. The maximum rotate speed is 20000rpm; ensure the spindle works well overtime

★ The spindle motor is directly connected to the spindle, eliminated the middle part, decrease vibration, increase the rotate accuracy and reaction time of the spindle.

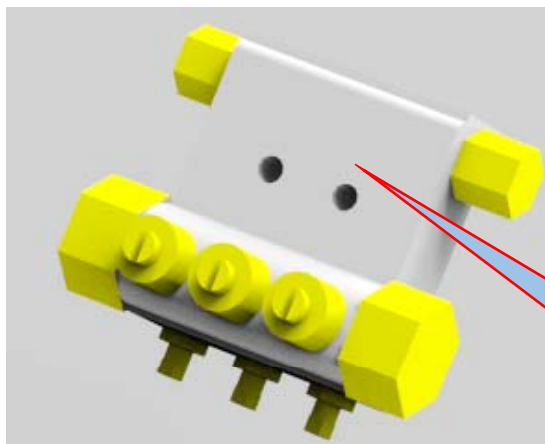
Direct driven spindle with modular design in order to match with different controller system



# IBAG ( Swiss ) electric spindle

★ IBAG build in high speed spindle, imported directly from Switzerland. The spindle was manufactured, assembled and tested in Switzerland; ensure the quality and the performance of each machine.

★ The bearing of the spindle use oil-air type lubrication, we use "LUBE" brand from Japan for the lubrication system. Use air-oil distribute lube inside the bearing evenly. Make sure the bearing is well lubricated, so the spindle works well



Precise filter

Air-oil lubrication pump

Air-oil distributor



# electric spindle machining condition suggestion

★ regular steel material machining suggestion

Tool diameter	φ20	
Vc	200	
S	3200	
Ad	0.3	0.5
F	6500	4000
Note	Better with 3 blade edges	

※ HSK-E50 maximum tool diameter φ20.

Tool diameter	φ42	φ35	
Vc	200	200	
S	1500	1800	
Ad	0.5	0.5	1
F	3000	6500	3200
Note	Better with 4-5 blade edges		

※ HSK-A63 maximum tool diameter φ35 , φ42 only for soft material.

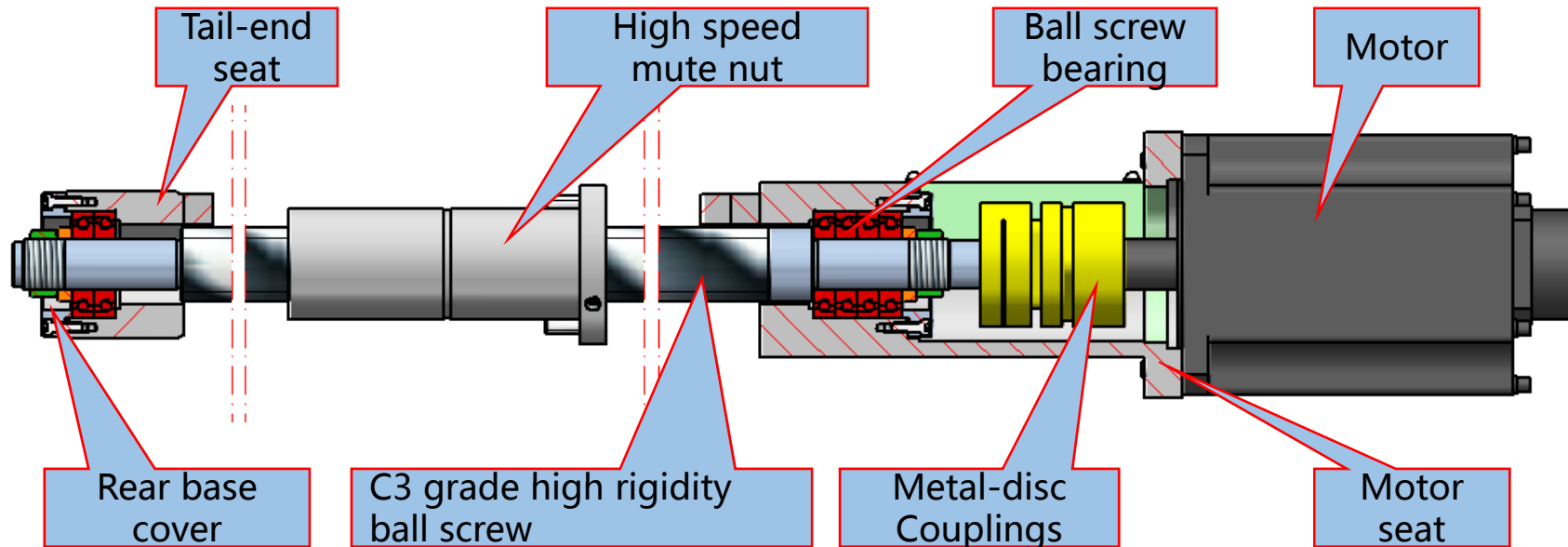
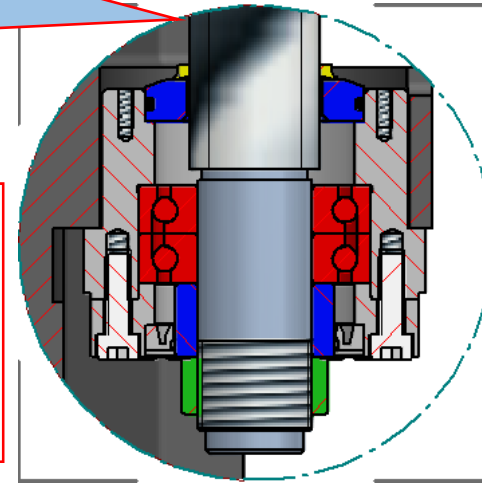
★ NAK80 grinding tool φ0.6mm ball cutter machining condition suggestion

Vc=40 S=18000 Ad=0.02 F=900 2 blade edges

# PMI Ball screw

The structure of the Z-axis rear bearing sealing (Patented)

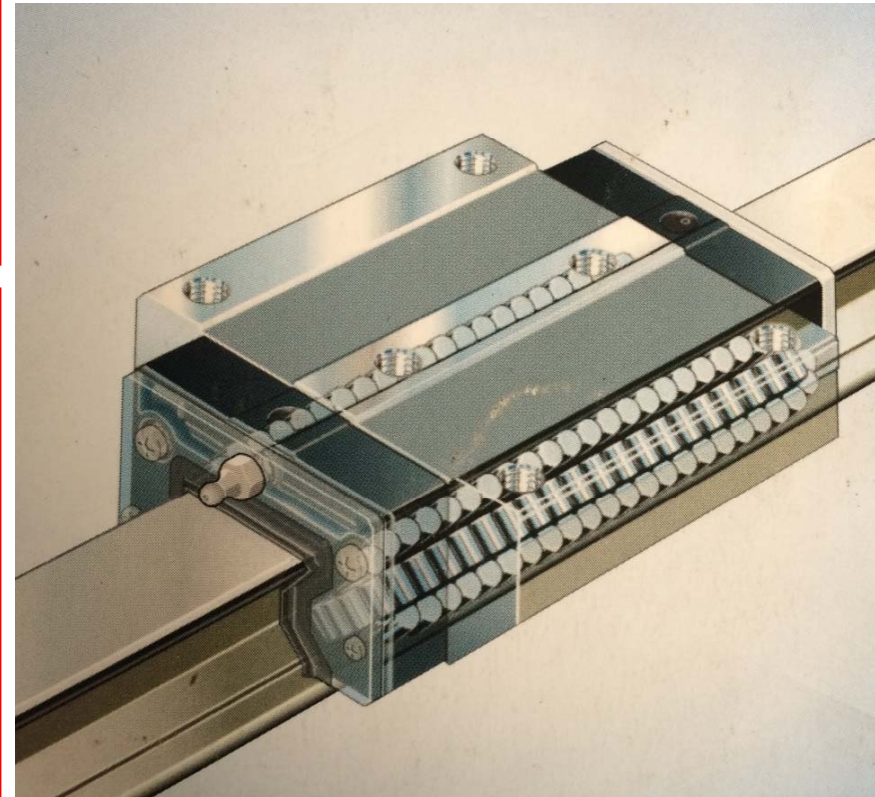
The 3 axis servo motor direct connect with the ball screw through gapless elastic coupling and with special pre-stretching which can prevent thermal deformation to keep ball screw with stable accuracy and rigidity as well as the running precision



## Germany Rexroth linear guide way

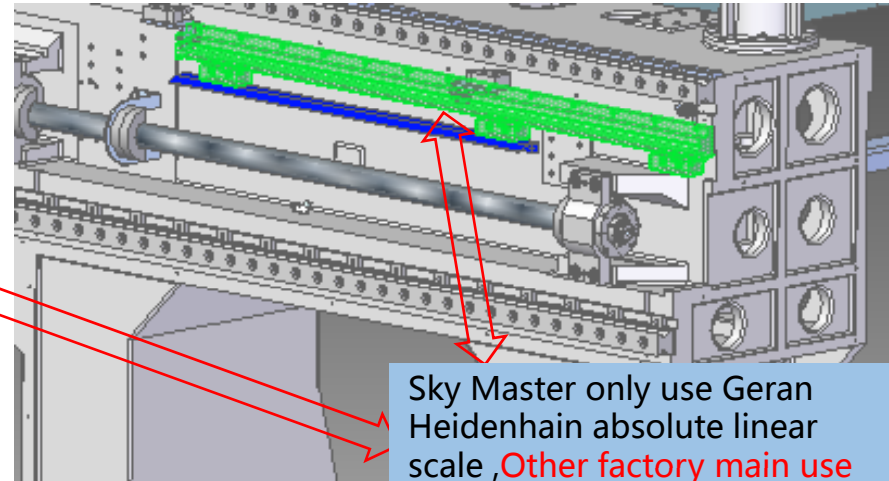
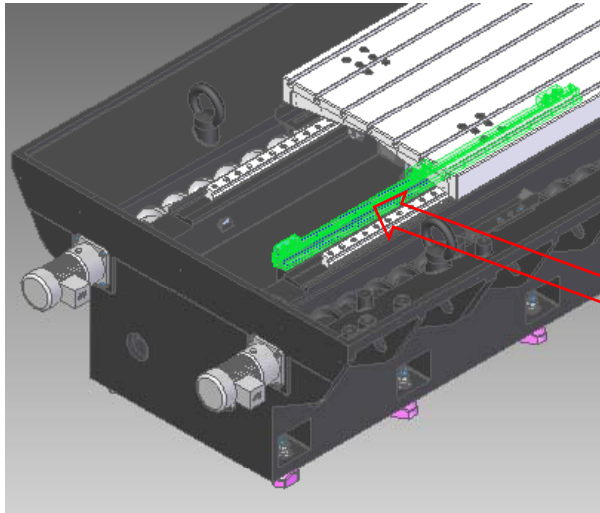
All three axis use Germany high rigidity P grade, ball type linear guide way with max loading, less wear, high accuracy and can bear the load from any direction on cross section

The guide way and the slide block both use precise machining, the two side surface can use as positioning line , therefore you can use this component in any combination, interchangeability is assured while the other brand only use one side surface as positioning line which is not convenience for maintenance.



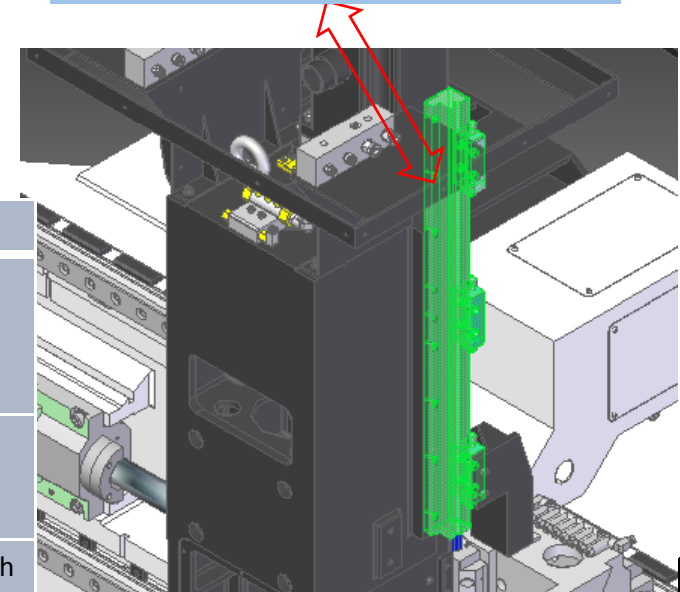


# Germany linear scale HEIDENHAIN



Sky Master only use Geran Heidenhain absolute linear scale ,Other factory main use Fagor and with Incremental type

All three axis can equip with Heidenhain absolute linear scale , the minimum resolution is only 0.05µm , real-time monitor the moving parts to ensure the accuracy for positioning accuracy and repeatability accuracy.



Comparison	Absolute	Incremental
1	Get the position data immediately ,no need to make the moving axis back to reference point	Must execute the moving axis back home position every time
2	The reading head use two couple seal side by side with good protection	The reading head is protected by single seal
3	Transmission by digit signal which has excellent anti-interference ability	Transmission by sine waves which is easy to be interference

## Japan SHOWA lubrication system

The full set of SHOWA lubrication system is imported from Japan(including electric lubricate pump, oil pipe , joint , oiler and so on) ,feed the oil to the slide block and other parts need lubrication with Self-timing and quantitative ,the lube system has the measurement switch of liquid level and pressure in order to keep the system with long and stable working.

## KTR ( German ) coupling

All three axes use metal disc coupling from KTR (German), high torque rigidity, low rotate inertia, zero back lashes



# Japan SMC pneumatic system

1. The whole set of SMC pneumatic system is imported from Japan
2. Ensure the air supply with clean and dry
3. Prolong the lifetime for pneumatic components .
4. The integral layout for pneumatic system is reasonable and elegant
5. Convenience for observe and maintenance

Water drop separator

Pressure switch

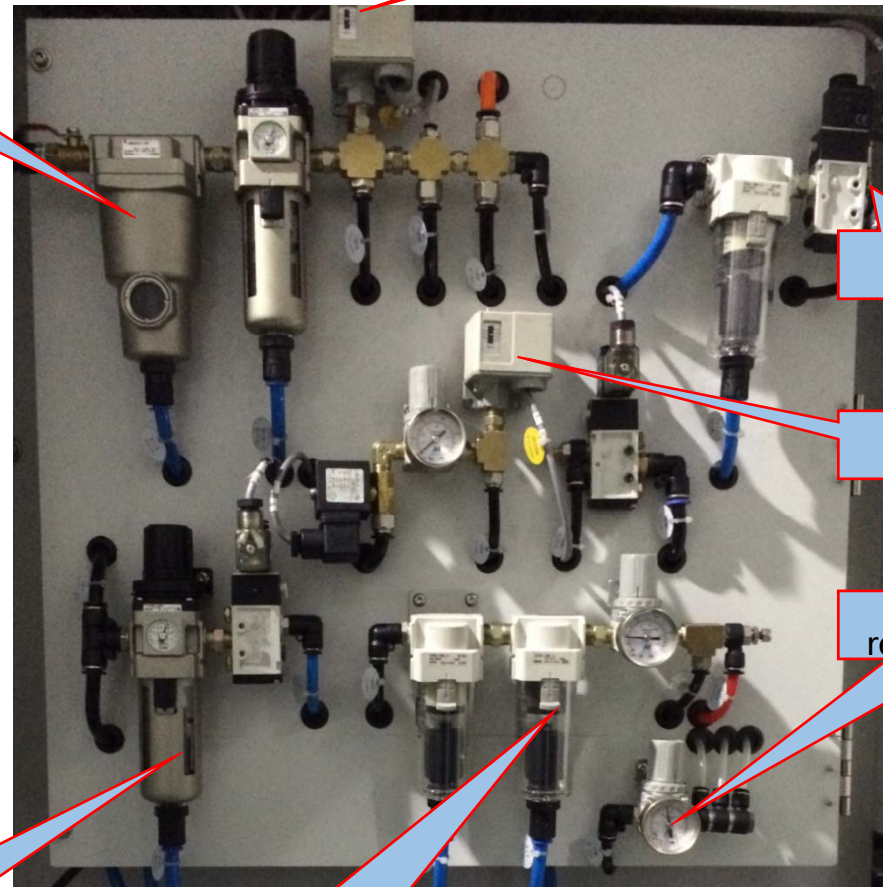
Solenoid valve

Pressure switch

Pressure regulating valve

Filter reducing valve

Precision filter component



# Desiccant air Dryer

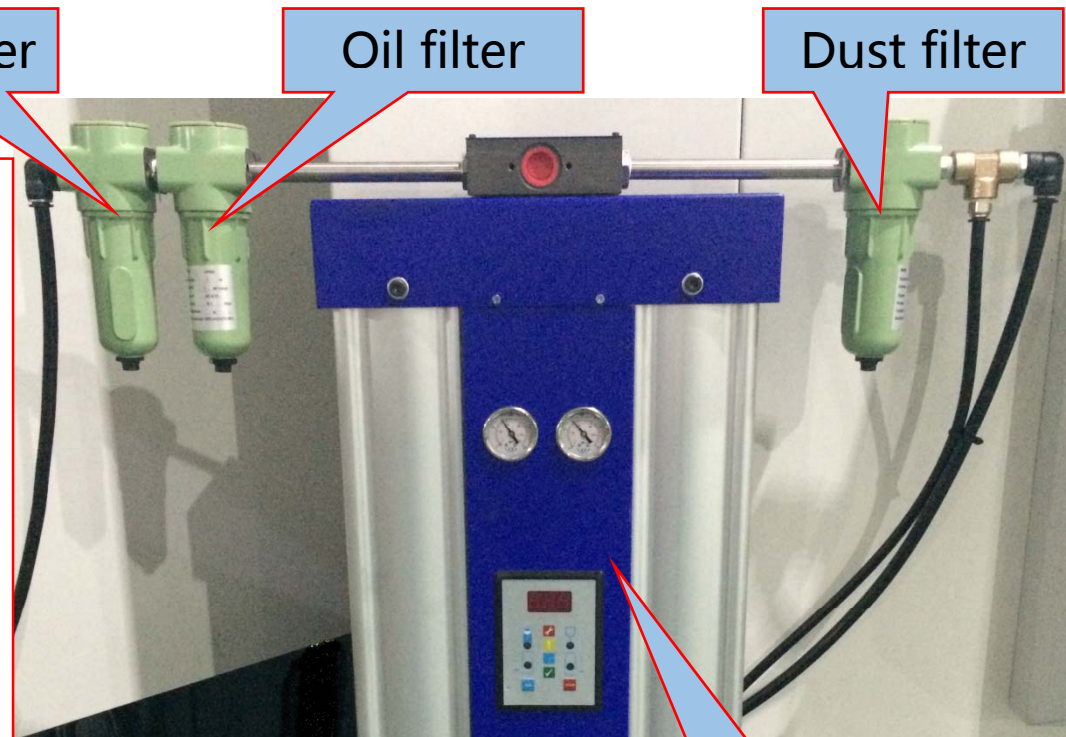
Water filter

Oil filter

Dust filter

the desiccant air dryer come as standard with electric spindle:

- Eliminate water, oil and impurity from the air source effectively
- Has a alarm output function, ensure the spindle' s usage
- the temperature of the dew point can reach  $-32^{\circ}\text{C}$ , a lot better than refrigerated air dryer



Desiccant air Dryer

Pressure leaking inspection value



# TNP spindle chiller

Spindle chiller is standard accessory , 1kW cooling capacity, spindle temperature rise is only 2°C which can force the spindle with circulating cooling ,remove heat rapidly to prevent the spindle from thermal expansion ,improve machining accuracy and the surface quality for workpiece .

Temperature sensor is fixed on the casting part of main machine , sensing the real temperature to ensure the cooling result



Temperature sensor



Spindle chiller

# TNP water cooling machine

VF1290A/B equip powerful water cooling machine as standard , cooling power can reach up to 4.5kW , match with coolant specifically for spindle , can control temperature change within 2 degrees , stop spindle' s heat extension , increase machining accuracy and surface quality.

The temperature probe was fixed to the casting part of the machine body, to get the real temperature, ensure the temperature accuracy

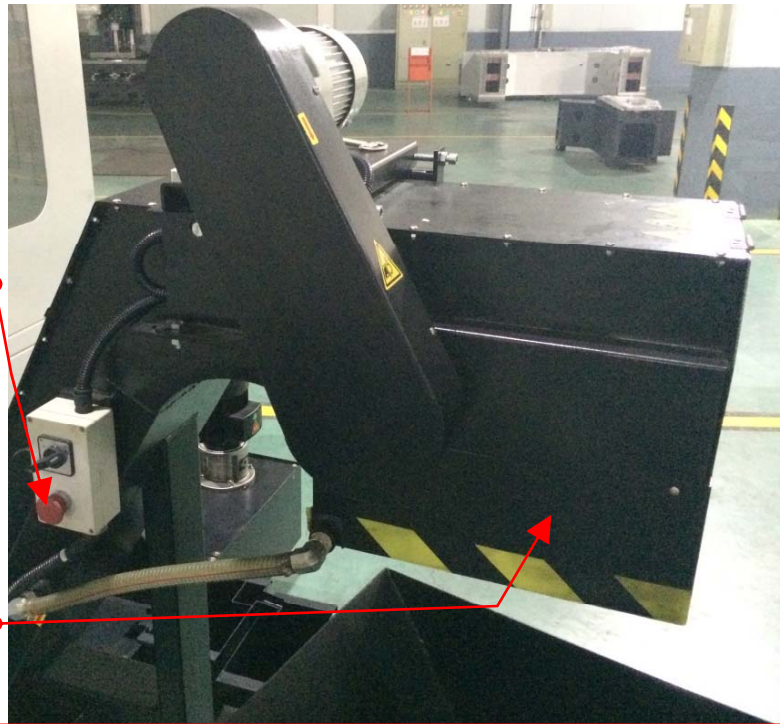
Temperature sensor



water cooling machine



## Taiwan Key Arrow chain chip conveyor



Emergency stop

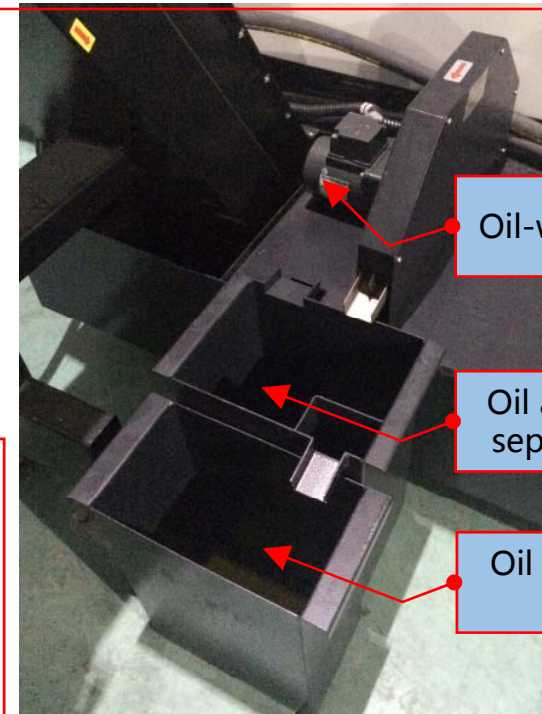
CE standard splash guard

Chain type chip conveyor is standard , remove the chips safely and effectively  
 ★ the chip output port is equipped with protection guard and alarm label to protect the operator.  
 ★ There is an emergency stop button on the chain chip conveyor ,it' s convenience for operator to press it under the emergency situation .

( Certified by Germany Tuv and got the CE already )

## Wobang oil skimmer

The oil skimmer can separate the oil from the coolant tank which can prolong the life time of cutting liquid.

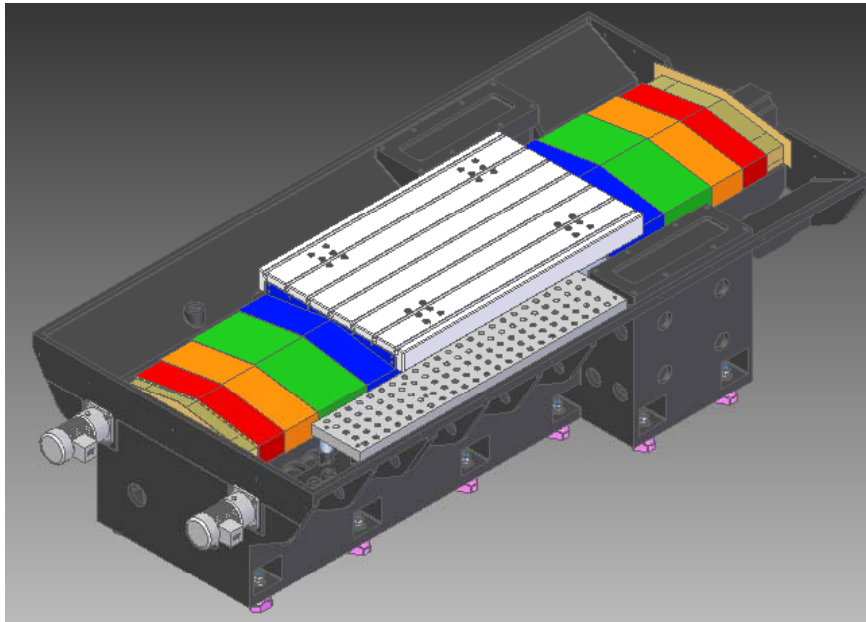


Oil-water skimmer

Oil and water separate box

Oil collection box

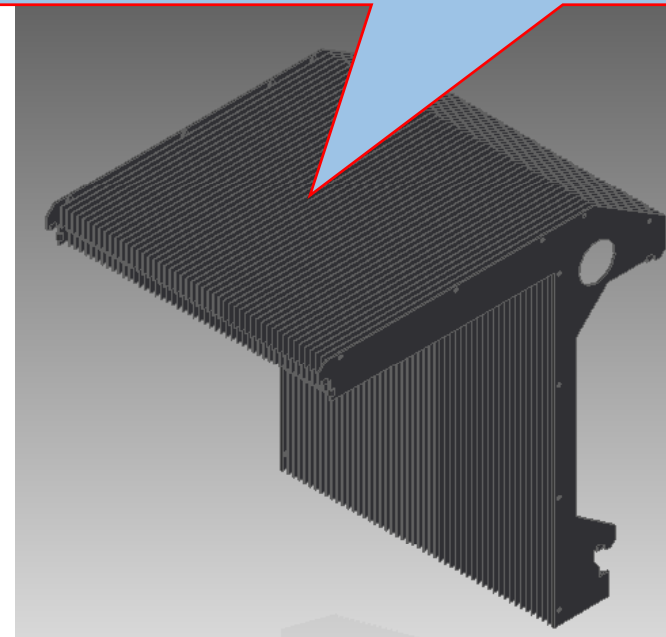
## Protection Shield characteristics



herringbone shaped stainless steel extensible protection shield will be aside of the worktable protecting the motor and other main components.

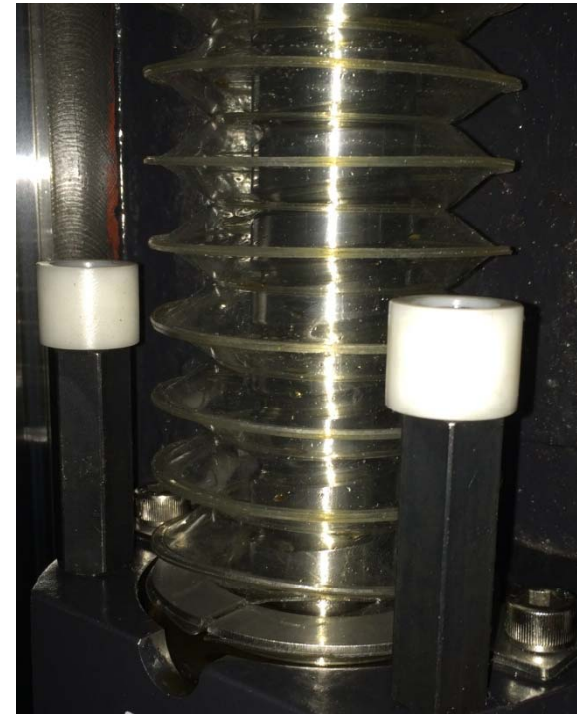
Japanese NAJEC T shaped organ protection shield was use either side of the Y axis, can protect components from cutting fluid and chips

T shaped organ protection shield





## Protection Shield characteristics



NAJEC T shaped organ protection shield for the Z axis and ball screw cover, can protect components from cutting fluid and chips

# MITSUBISHI M730VW CONTROLLER (VF1290A/B)

SKY MASTER  
STANDARD

## Full nanometer control - M700V series

### M700VS series

- Integrated control unit and display
- M700 operation environment without windows operating system



### M700VS series

- Separated control unit and display
- Windows XPe operating system, advanced customization function is available



Based on the latest technology of LSI

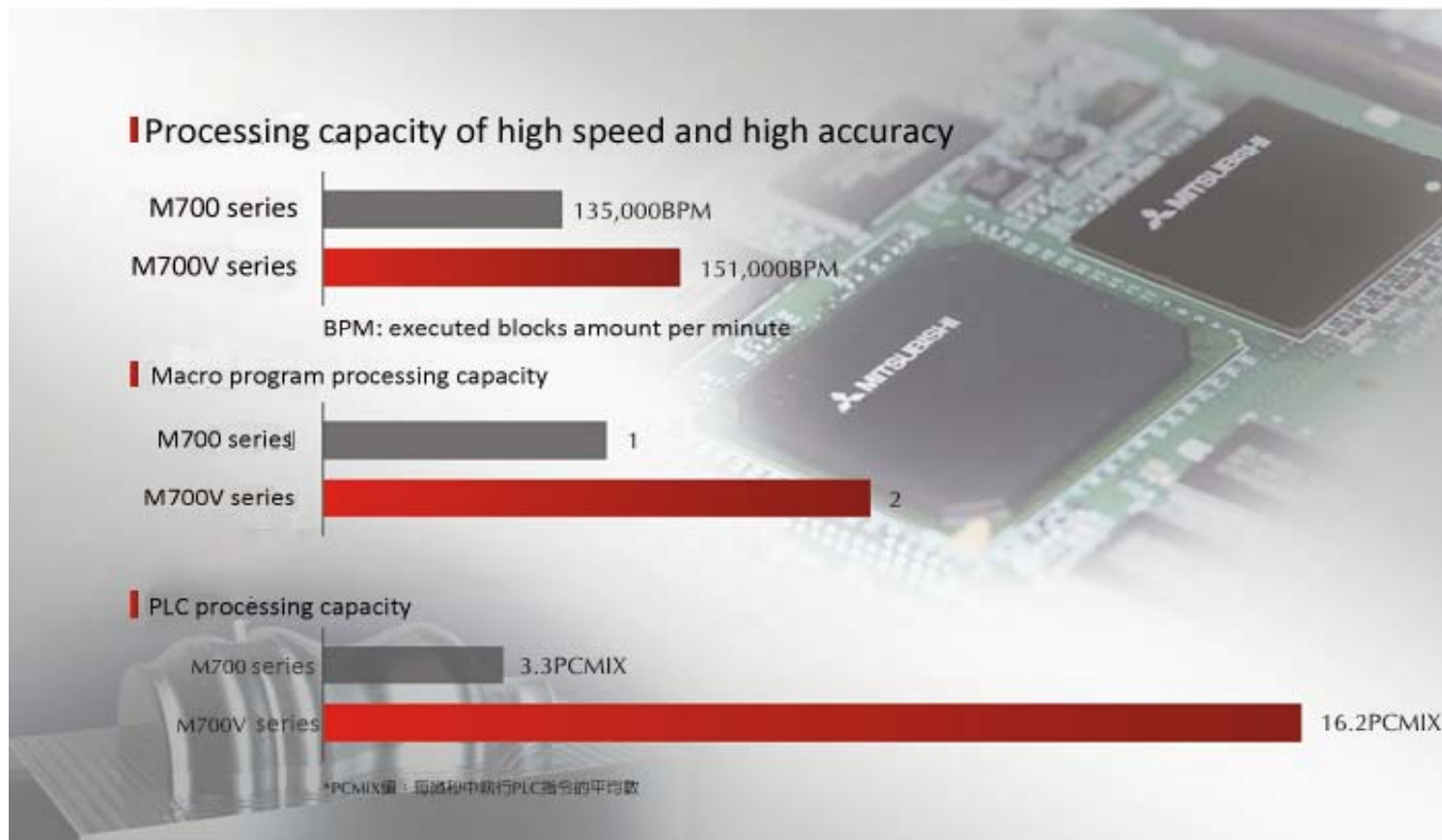
- Applying built-in PLC executor, the processing speed is enhanced enormously
- NC performance is enhanced
- Full nanometer control, high speed and high accuracy control, SSS control

Enable to enhance the machining accuracy and reduce the processing time

## M730VW controller



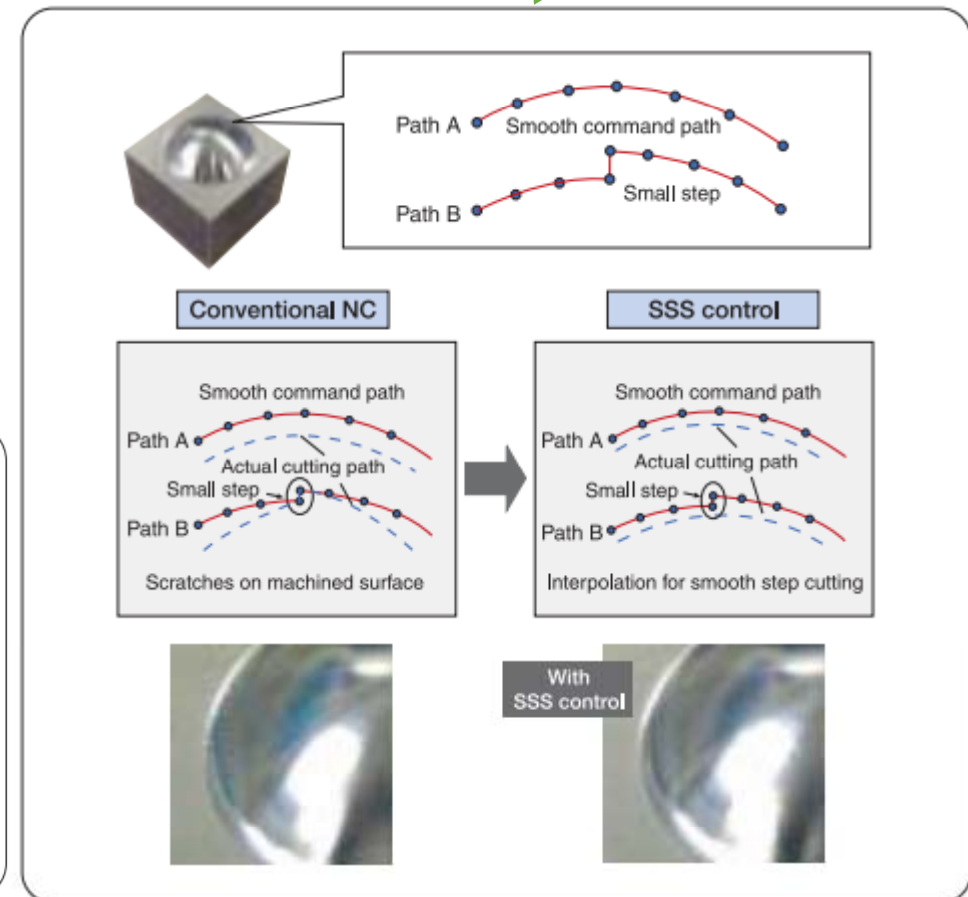
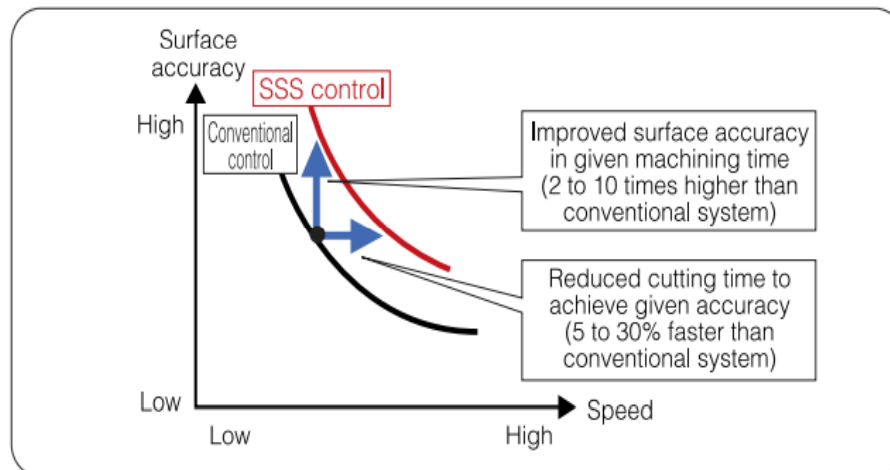
Apply the 64 bits RISC processor and special high speed integrated circuit to enhance the processing capacity, PLC performances and graphing capacity  
Equipped with Windows Xpe system in M700VW controller to meet the requirements of developing the customization screen



## M730VW controller (VF1290A/B)

### SSS Control for Stable Machining Quality

- SSS control ensures high machining stability and quality with virtually no effects resulting from cutting shape or speed.
- SSS control reduces processing time by 5 to 30% relative to a conventional system, significantly increasing feed speed.
- An approximate shape is estimated from command paths to achieve smooth and even machining surfaces, even with stepped surfaces.

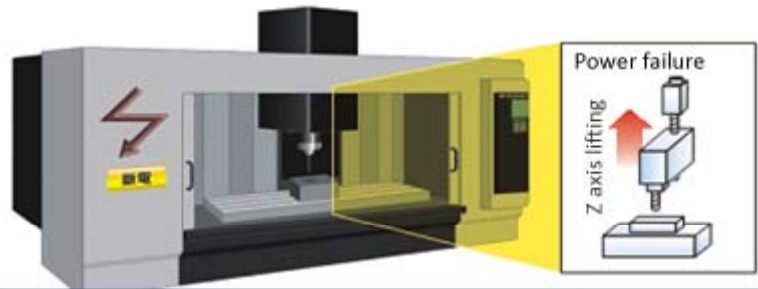


# M730VW controller (VF1290A/B)



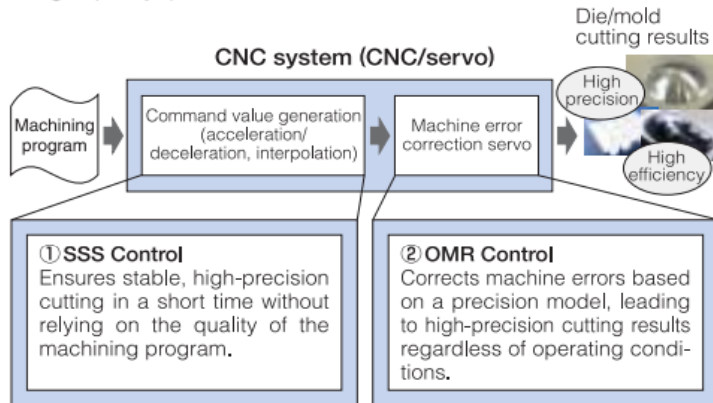
## Power failure detect function

The Power failure detect function aiming at the gravity axis fall protection at the time of a power failure was occurred.



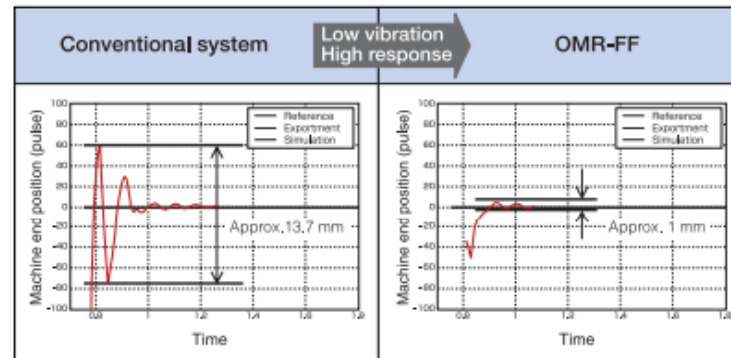
## High-Speed, High-Precision Die/Mold Cutting

- Full-fledged nano-control enables high-speed, high-precision cutting at a maximum 135kBPM in fine segment feeding.
- Combined state-of-the-art technologies—such as full-fledged nano-control, SSS control, and OMR control—result in extremely high-quality, precision results.



## OMR-FF Control for Accurate Cutting In Accordance with Commands

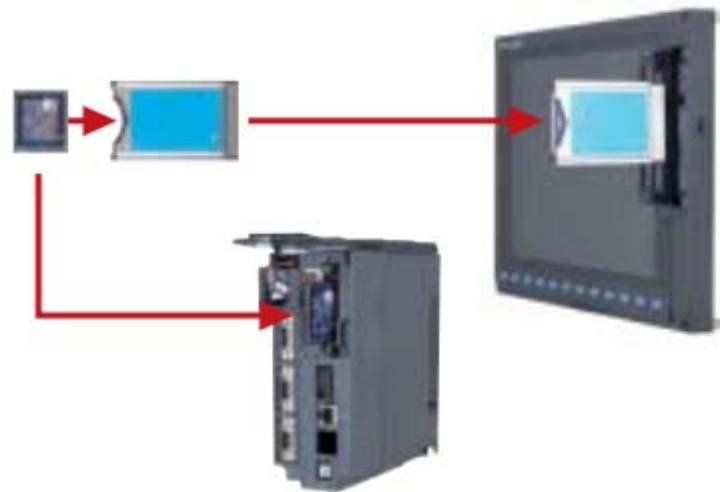
- The OMR-FF (Optimum Machine Response–Feed Forward) control provides machine-friendly feed forward control to minimize machine vibration and maximize machine performance.



## M730VW controller (VF1290A/B)

### Standard PCMCIA Slot

- The IC card interface, located on the front panel of the communication terminal, accepts IC Card and Compact Flash Card.
- Since the cover can be closed with a card in the slot, the card will not be in the way or detach accidentally.
- The IC card interface (located on the front panel of the communication terminal) and the Compact Flash interface (featuring a built-in control unit) enable batch input/output of required maintenance data.
- Subprogram call is available from the Compact Flash Card .



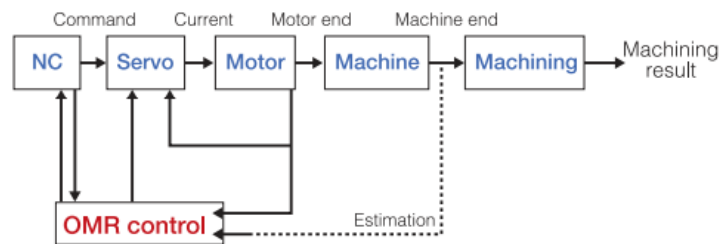
## M730VW controller (VF1290A/B)



### OMR : Optimum Machine Response Control

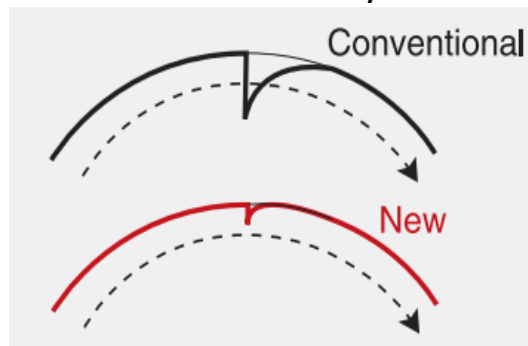
Unlike conventional control, which simply matches the motor path to the command, OMR (Optimum Machine Response) control estimates the machine's status based on a model and applies correction to motor control in order to match machine position – to the commands.

OMR control—High-precision correction function adaptable to various machines



### OMR - II : Backlash correction with filter

The new filter ensures high-precision correction against gradual loss of motion due to a high coefficient of viscosity.



## M730VW controller (VF1290A/B)

MDI    NON    Monitr    Setup    Edit    Diagn    Mainte	
High-speed program server mode	Spline interpolation (M)
Front IC card mode	NURBS interpolation (M)(*1)
Hard disk mode	3D circular interpolation (M)(*1)
Least command increment 1um	Feed per revolution
Least command increment 0.1um	Inverse time feed (M)
Least command increment 0.01um (*1)	Manual feed rate command
Least command increment 1nm (*1)	Rapid traverse multi-step acc/dec (M)
Least command increment 0.1nm (*1)	Thread cutting (Lead/Thread numb)
Inch/Metric changeover	Synchronous tapping cycle
Command increment tenfold (M)	Pecking tapping cycle (M)
Unidirectional positioning (M)	Deep-hole tapping cycle (M)
Helical interpolation	Circular thread cutting (L)
Spiral/Conical interpolation (M)	Mnl feedrate B surf speed ctrl (M)
Cylindrical interpolation	Memory capacity (40m)
Polar coordinate/Milling interpolation	Memory capacity (80m)
Hypothetical axis interpolation (M)	Memory capacity (160m)
Exponential interpolation	Memory capacity (320m)
	(*1):M730/750, (*2):M750

10G hard disk

Least command increment 1um

RDY

09:40



## M730VW controller (VF1290A/B)

MDI    NON    Monitr    Setup    Edit    Diagn    Mainte	
Bklash auto adjust (M)	Automatic tool length measurement
Memory-type pitch error compensation	Manual tool length measurement 1
Memory-type relative posn err compen	Manual tool length measurement 2
External machine coord system compen	Workpiece coord offset measurement (L)
Circular error radius compensation	Workpiece position measurement (M)
Ball screw heat expansion compensation	Rotate measurement (M)
Machine rot center err compen(M)(*1)	Tool life management I
Pos-depend increasing backlash	Tool life management II
Two-way pitch error compensation	Tool life management III (M)
OMR II	Tool life sets (200) (M)
OMR-FF	Tool life sets (400) (M)
Distance-coded ref position detection	Tool life sets (600) (M)
Skip (hi-speed skip)	Tool life sets (800) (M)
Multiple-step skip	Tool life sets (1000)(M)
PLC operation skip	Programmable current limitation
Variable speed skip	Load monitoring I
High-accuracy skip	Stored stroke limit I B
	(*1):M730/750, (*2):M750

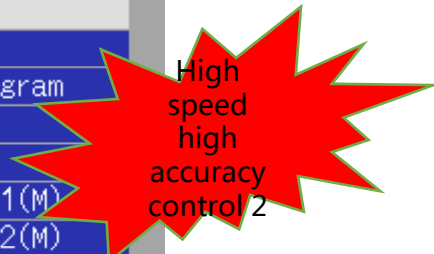
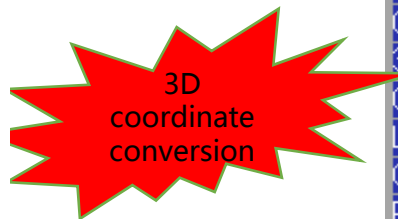


RDY

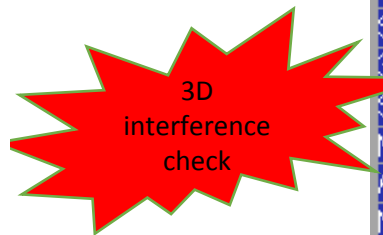
09:46

## M730VW controller (VF1290A/B)

MDI    NON    Monitr    Setup    Edit <b>Diagn</b> Mainte	
Compound typ turning fixd cycl (L)	Start point designation sync (L)
Compound typ turning fixd cycl (II)(L)	Balance cut (L)
Small-diameter deep-hole drill cy (M)	Parameter input by program
Mirror image for parameter setting	Compensation data input by program
External input mirror image	High-speed mode I (G5P1) (M)
Mirror image for facing tool post (L)	High-speed mode II (G5P2) (M)
T code mirror for facing tool post (L)	High-speed high-accuracy ctrl 1(M)
Coordinate rotation by program	High-speed high-accuracy ctrl 2(M)
Coordinate rotation by parameter (M)	High-accuracy control (G61.1) (M)
3-dimensional coordinate conversion(M)	High-accu spline interpolation 1 (M)
Corner chamfering/Corner R	High-accu spline interpolation 2 (M)
Linear angle command	SSS Control (M)
Geometric command	hi-accu acc/dec t-const ext (M)
Polar coordinates command (M)	Direct command mode (L)(*1)
Chopping	Playback
Normal line control (M)	Simple programming
Circular cutting (M)	G code guidance
	(*1):M730/750, (*2):M750
<b>RDY</b>	09:45



## M730VW controller (VF1290A/B)



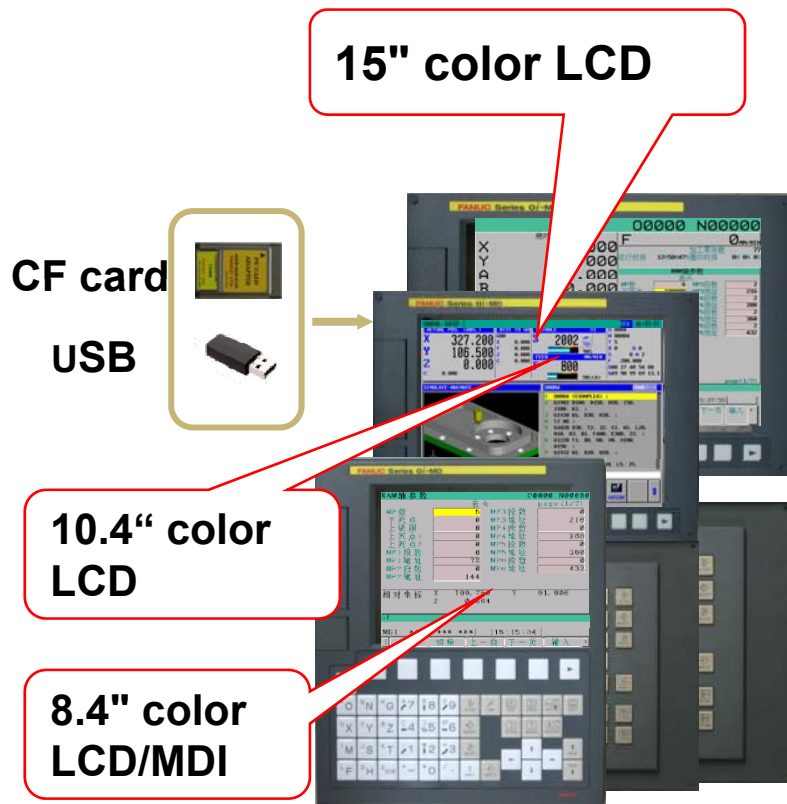
MDI    NON    Monitr    Setup    Edit <b>Diagn</b> Mainte	
Load monitoring I	T-length compen along T-axis (M)(*1)
Stored stroke limit I B	Tool handle feed & interruption(M)(*1)
Stored stroke limit II B	Tooltip control (M)(*2)
Stored stroke limit I C	Inclined surface machining cmd (M)
Stroke check before movement (M)	T-radius compensation for 5-ax.(M)(*2)
3D Machine Interference check (M)(*1)	Workpiece position error compen(M)(*2)
Safety observation	Manual feed for 5-axis machining (M)
Machine builder network system	R-Navi (M)
Anshin-net	Circular feed in manual mode
NC Maintainer	PLC axis control
PLC switch 64 points	PLC axis index
Large PLC capacity	PLC window
Pallet program registration (M)	External search
Control axis detach	APLC
Synchronous control	System lock
Inclined axis control (L)	
Position switch (24sets)	

(\*1):M730/750, (\*2):M750

RDY 09:40

# FANUC NEW SERIES— **0i-MODEL F** SYSTEM

➤ SKY MASTER-KRAFT standard configure 0i-MODEL F **TYPE 1** (other manufactories normally choose TYPE 5)



- 15 " display is available
- Max. total control axes:
  - 9 axes (one path)
    - Max. feed axes : 7 Max. spindle axes : 2
  - Max. feed axes: 11 axes (two paths)
    - Max. feed axes : 9 Max. spindle axes : 4
- Loader control: Max. 2 paths<sup>☆</sup>
- Servo HRV+ control
- High quality machining package<sup>☆</sup>
- FSSB high speed rigid tapping
- Machining preparing support<sup>☆</sup>
- Support various industrial bus
- Integrate Servo Guide Mate

**MORE**

**MORE ACCURACY AND EFFICIENT**

**Automation+**

# FANUC NEW SERIES— **0i-MODEL F** SYSTEM

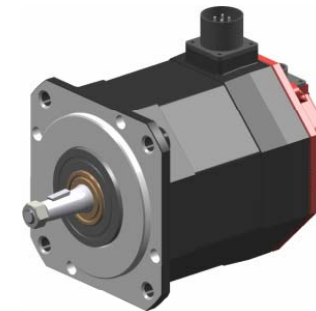
## Servo control accuracy improvement

	Old	New
<i>αi</i> -B	<i>αi</i> A1000 1,000,000/rev. →	<i>αi</i> A4000 4,000,000/rev.
	<i>αi</i> A16000 16,000,000/rev. →	<i>αi</i> A32000 32,000,000/rev.
<i>βi</i> -B	<i>βi</i> A128 128,000/rev. →	<i>βi</i> A1000 1,000,000/rev.



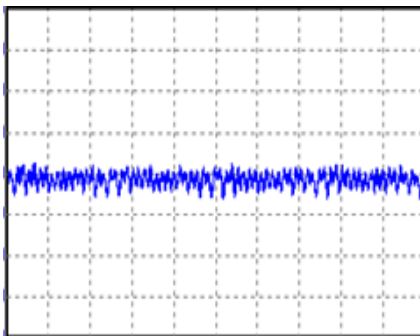
Electromagnet loop optimized

(*αi*S-B, *βi*S-B)



0.1μm control is available

*αi*S/*βi*S motor

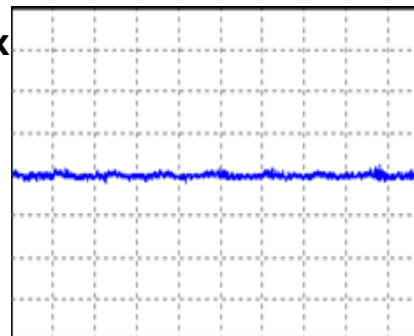


Approx

1/3



*αi*S-B/*βi*S-B motor



# FANUC NEW SERIES— 0i-MODEL F SYSTEM (VF1290)

Smart overlap

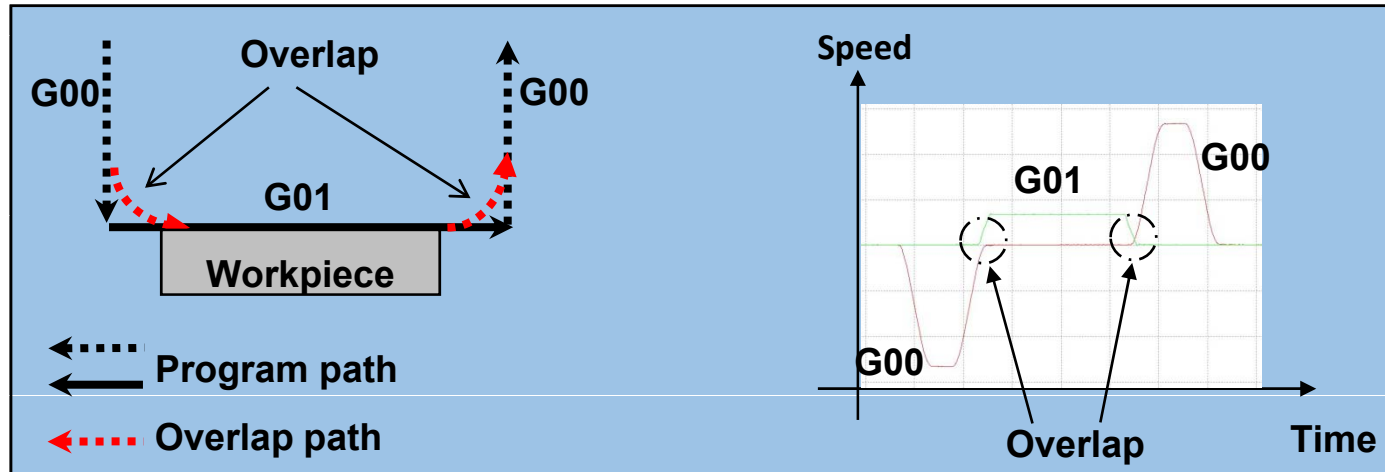
High speed and high quality machining



G00 → G00  
G01 → G00  
G00 → G01



**Efficiency1**  
Theoretical error display



# FANUC NEW SERIES— **0i-MODEL F** SYSTEM (VF1290)

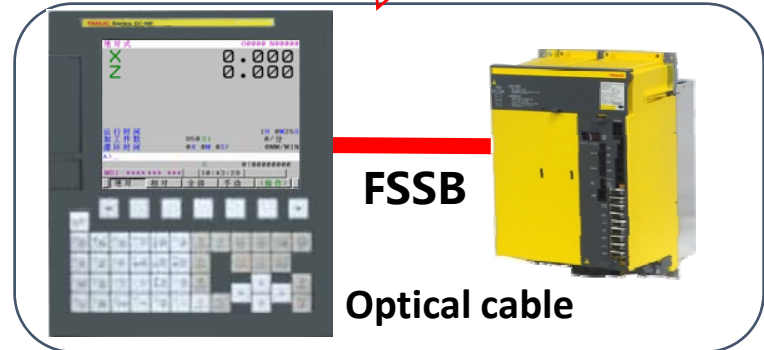
## FSSB HIGH SPEED RIGID TAPPING

Advanced digital servo technology

**23%**

**SKY  
 MASTER  
 STANDARD**

**Efficiency 2**  
 Theoretical  
 error display



**E.g : S3000 20mm Pitch 1mm tap**

<p><b>Normal rigid tapping</b>                  Error : 60pulse                  1 cycle : 1815ms</p>	<p><b>→</b></p>	<p><b>FSSB high speed rigid tapping</b>                  Error: 50pulse                  1 cycle : 1392ms</p>
<p><b>Cycle time save 23%</b></p>		

# FANUC NEW SERIES— **0i-MODEL F** SYSTEM (VF1290)

Spindle intelligent rigid tapping

Advanced digital servo technology

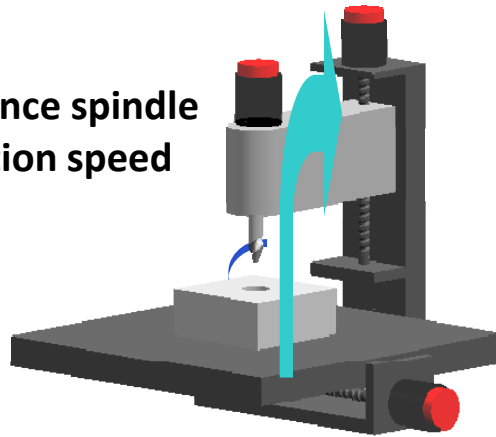
**26%**

E.g.: Pitch 1mm, 25 circle thread, S5000  
Apply FSSB high speed rigid tapping

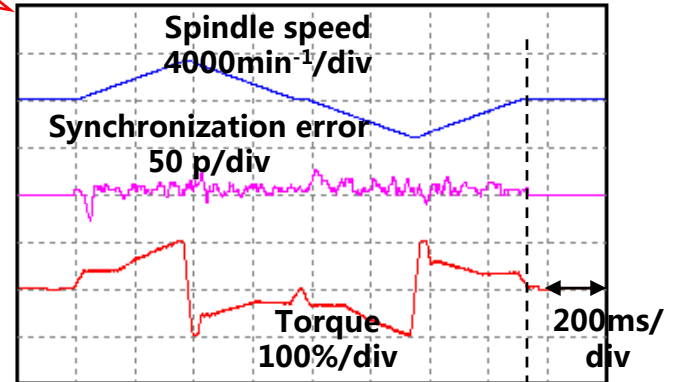
**SKY MASTER STANDARD**

Apply FSSB optical transmission

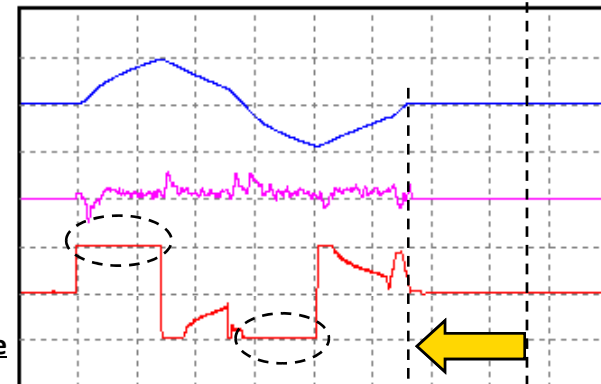
Enhance spindle reaction speed



**Efficiency 3**  
Theoretical error display



Intelligent rigid tapping



- > Fully perform the spindle acceleration /deceleration capacity
- > Reduce cycle time significantly
- > No need to adjust

Use the max. torque

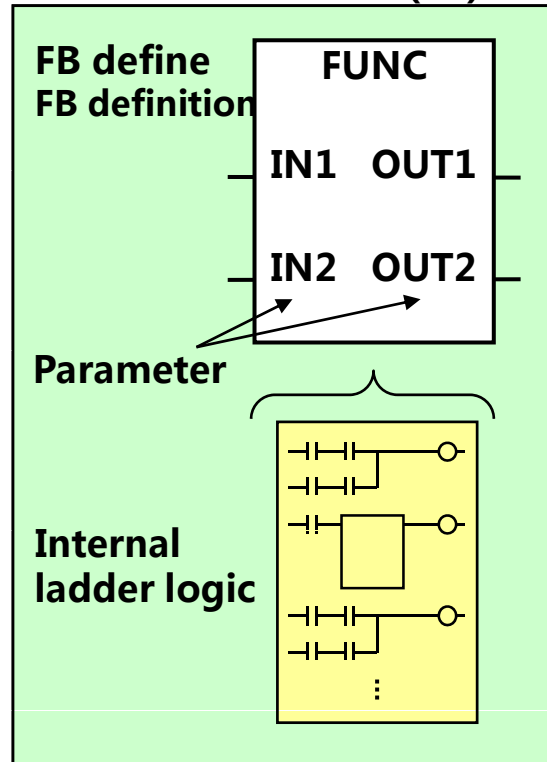


# FANUC NEW SERIES— **0i-MODEL F** SYSTEM (VF1290)

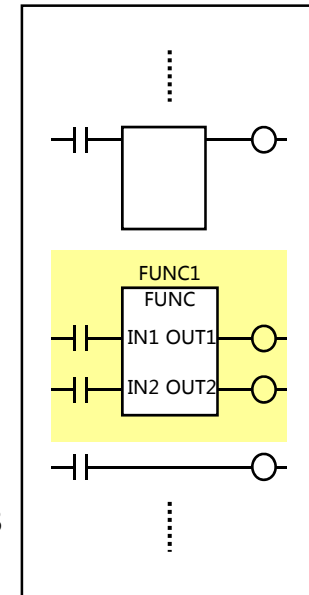
## PMC Function Block Efficient PMC program

**Efficiency 4**  
 PMC modulation programming

Function Block (FB)

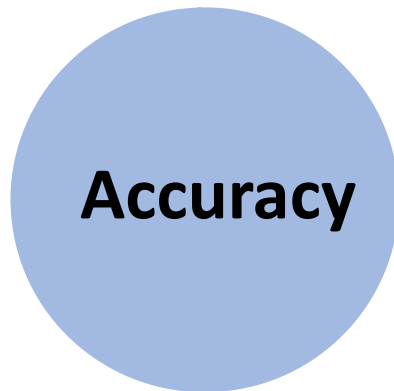


➔  
 Create ladder logic using FB



## FANUC NEW SERIES— **0i-MODEL F** SYSTEM (VF1290)

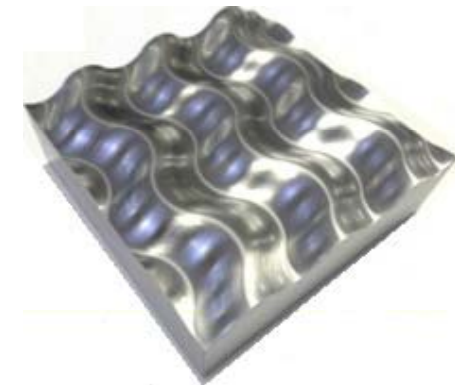
### High quality machining package



AI contour control II  
Jerk control  
Smooth tolerance control  
Machining quality level  
adjustment function

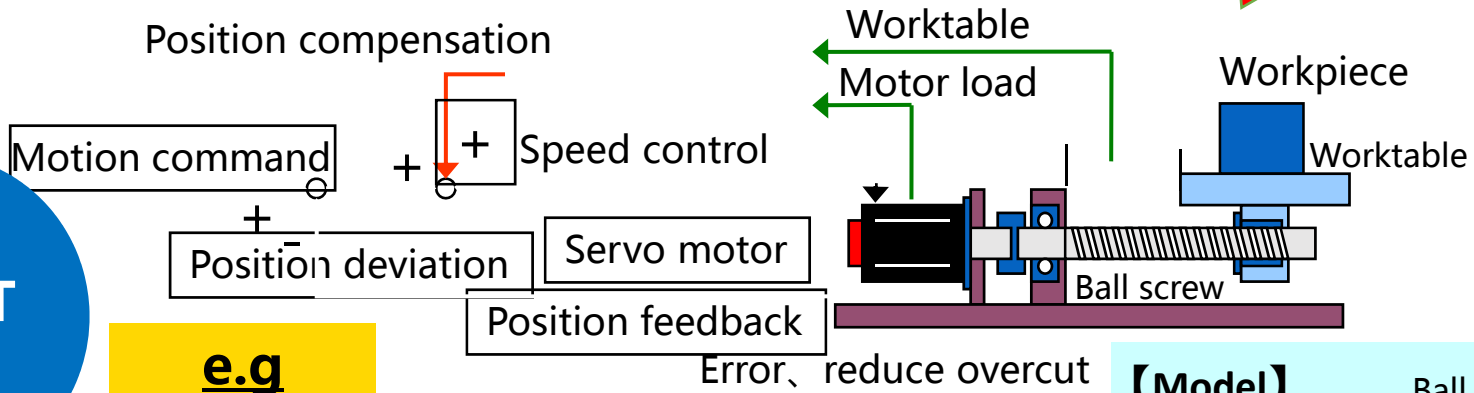
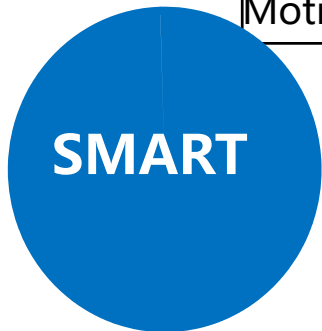
Packaging function , especially  
for mould machining

Micro-line blocks processing ability  
enhances 200%

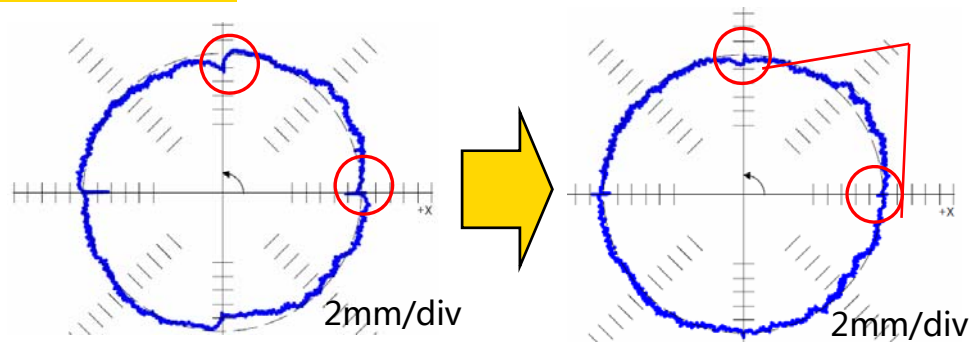


# FANUC NEW SERIES— 0i-MODEL F SYSTEM (VF1290)

Intelligent backlash  
Further optimize system function

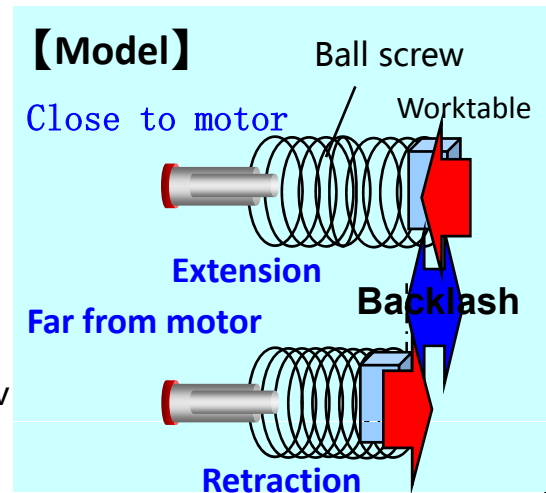


**e.g**



Normal backlash compensation

Intelligent backlash compensation



## FANUC NEW SERIES— 0i-MODEL F SYSTEM (VF1290)

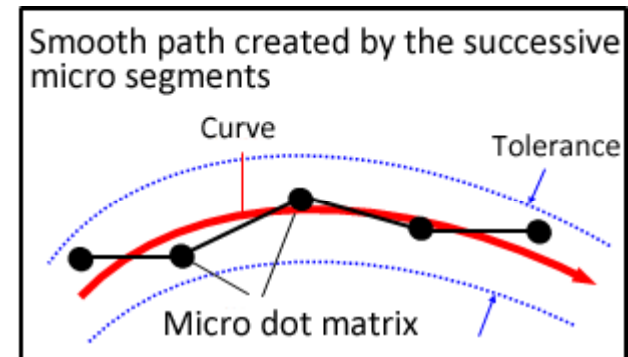
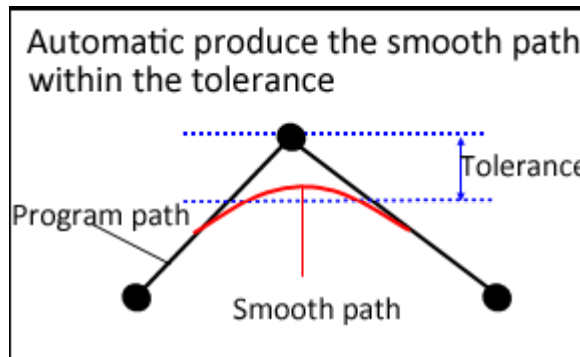
# Smooth tolerance control



Reduce the accuracy adjusting time and steps

Achieve the high accuracy machining.

- Automatic recognize the optimum machining speed.
- Reduce the mechanical shock during the processing of micro line blocks.
- Easy to adjust



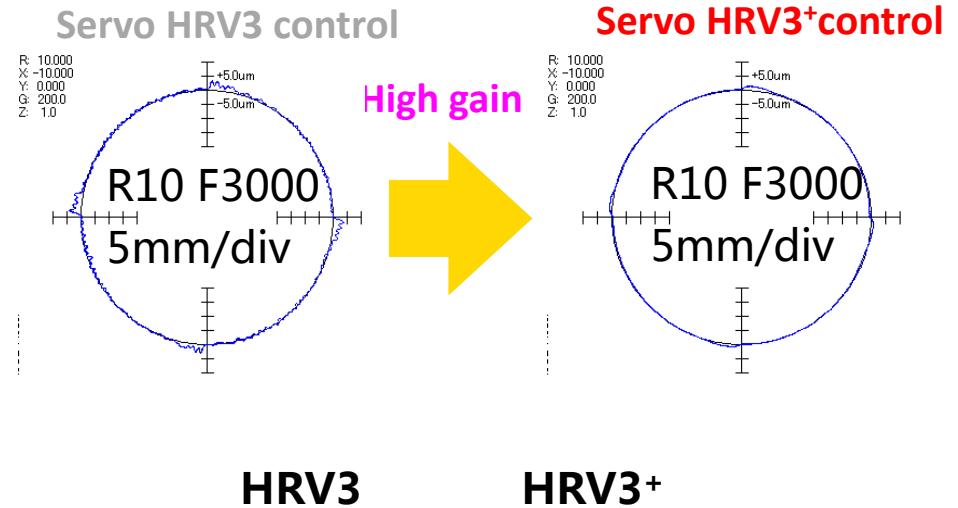
## FANUC NEW SERIES— 0i-MODEL F SYSTEM (VF1290)

### HRV+control

Advanced digit servo technology



- Servo HRV<sup>+</sup>, optimize current loop control to achieve high respond
- Nanoscale high speed and high accuracy machining
- 0iF system, HRV<sup>+</sup> control can also be applied on the  $\beta$ i-B servo motor

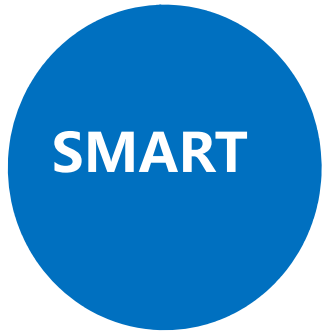


Iron F1000, 45deg

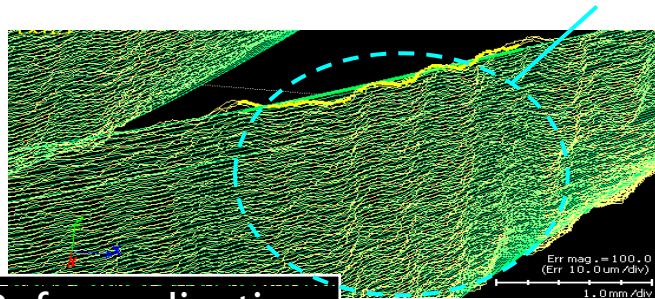
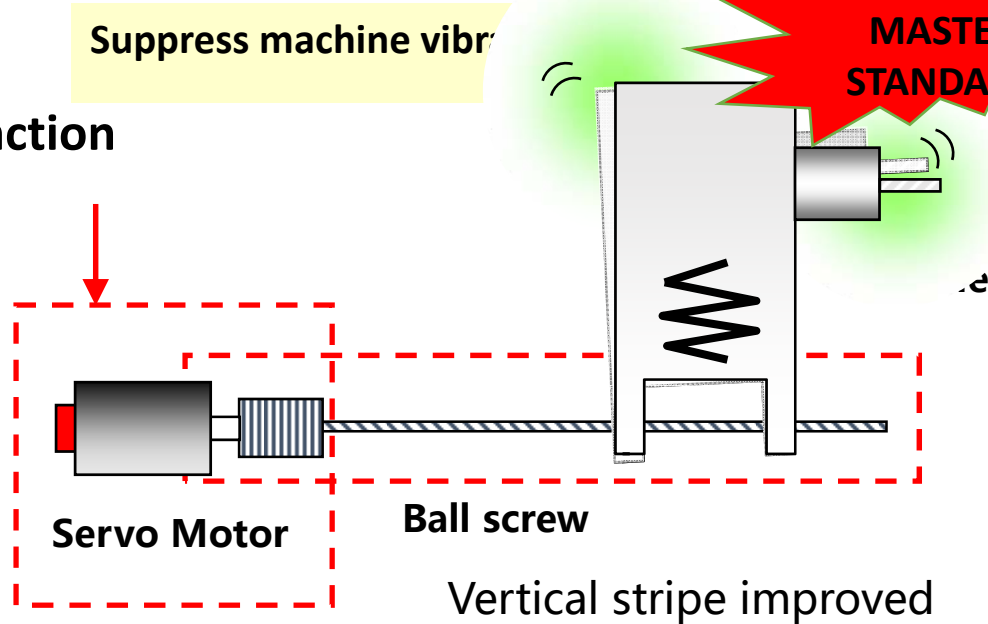
# FANUC NEW SERIES— 0i-MODEL F SYSTEM (VF1290)

Smart front control

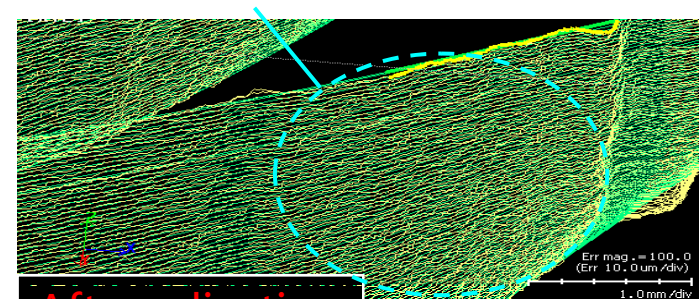
Further optimize system function



Suppress machine vibration



Before adjusting



After adjusting

## FANUC NEW SERIES— **0i-MODEL F** SYSTEM (VF1290)

**OPTION**

MANUAL GUIDE(operation guide)0i	MANUAL GUIDE(operation guide)i
PICTURE function	Dynamic graph display
Data server	Program storage capacity 2M
3-dimensional coordinate system conversion, handle interruption	AICC 2 (Max. preview blocks 400)
Machine alarm messages diagnosis	Nano smooth
Remote diagnosis	Interpolated straightness compensation 3027 points
CNC status informing function	Interpolation type pitch error compensation
CNC double display screen function	Optimum torque acceleration/deceleration
Quick macro call	5 axes system
Addition of custom macro common variables 1000	8 grades data protection
Addition of workpiece coordinate system 300	Handwheel feed retract

## Electrical tools: high quality tools made in Germany

Wire ferrule crimper: it can press max. 50mm<sup>2</sup> casing terminal, the price is fifth times higher than some ordinary wire ferrule crimper, uniform nip pressure to ensure the accuracy of the pressure line appearance, square crimp sleeve terminals ensure optimum contact surface pressure clamp



Phoenix cable identification

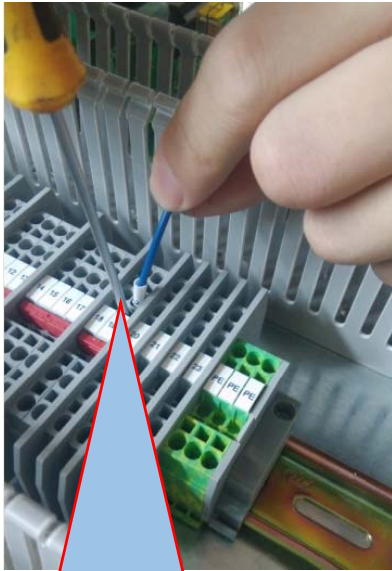


Cable stripper: applies to the diameter of the cable 4.5~40mm, without hurt inner wire.

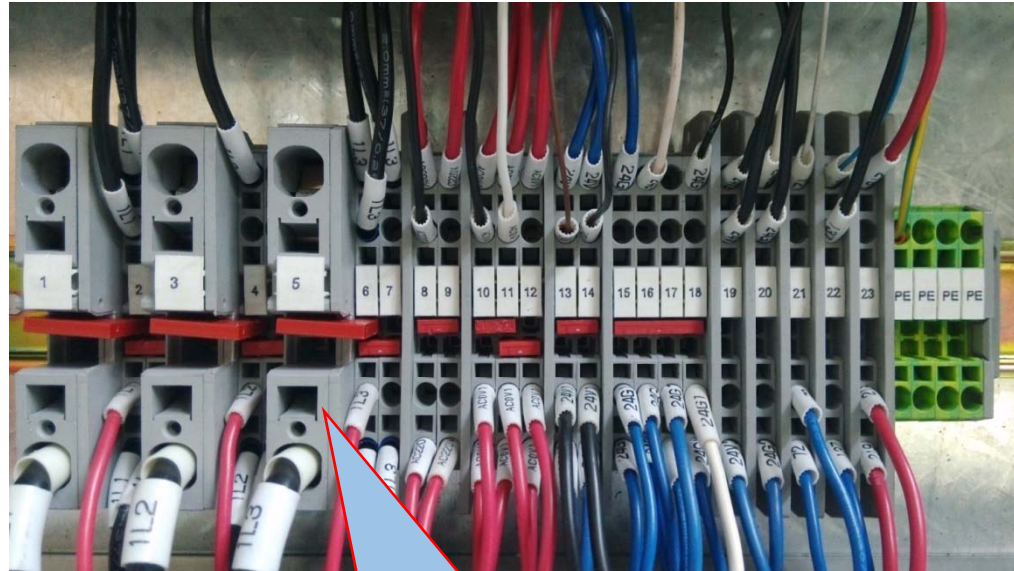




## PHOENIX terminal blocks

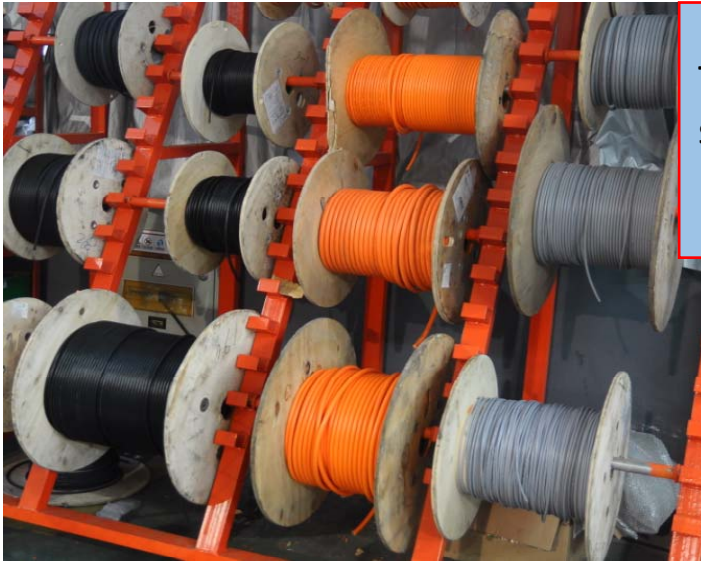


Only using a standard screwdriver to open the wire contactor and insert wire into it. The high-density blocks reduce wiring time, minimize troubleshooting, and perform in severe conditions.



Spring-clamp terminal blocks offer screwless termination technology, a fast and practical solution for secure and durable connections. The price is ten times more than the ordinary terminal blocks.

## IGUS cable and drag chain made in Germany



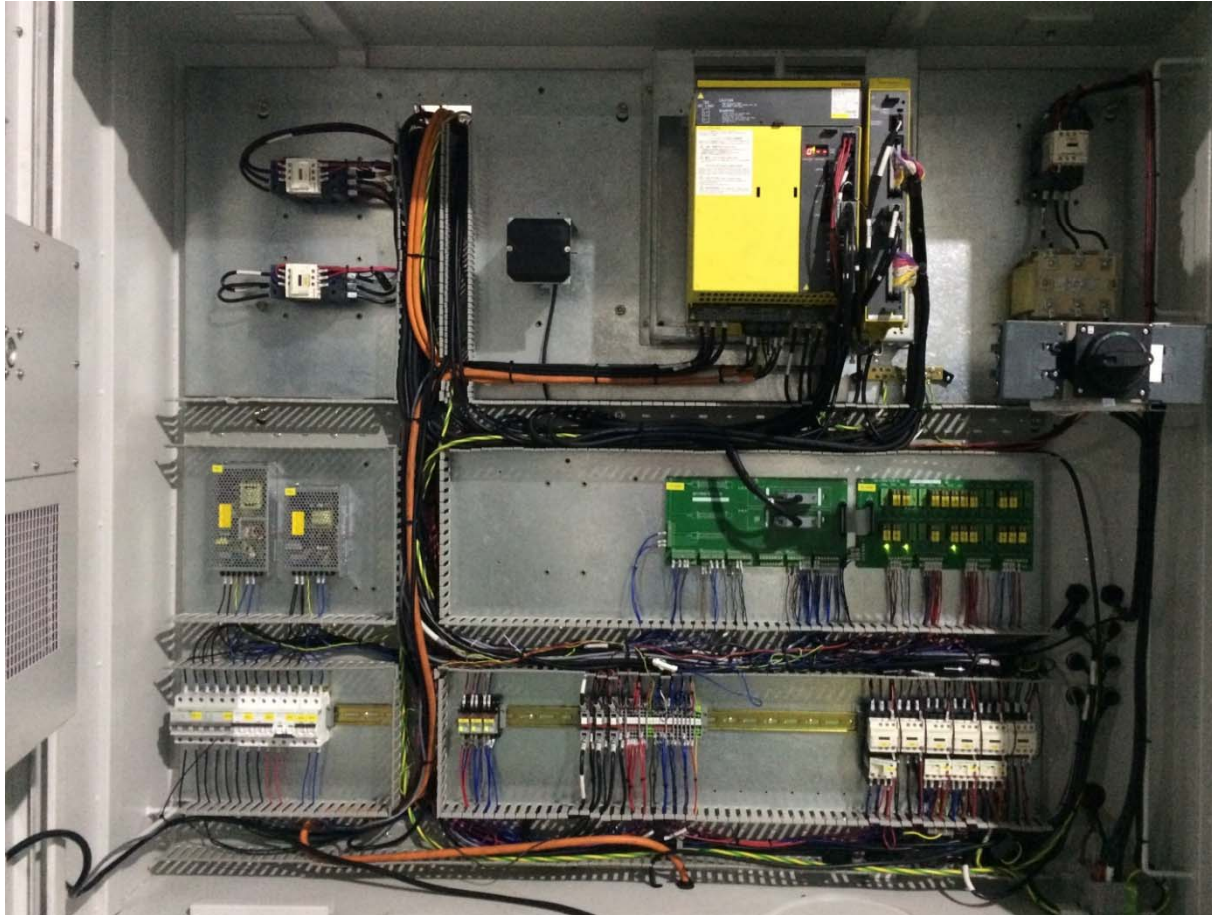
This cable chain can be supplied with separator to guide the cables.



Meet the European standards, the cable is classified according to color

Signal cable	Green
Power cable	orange
Alarm cable	yellow
Motor and inlet cable	black
Solenoid valve cable	grey
Grounding	Yellow/green

## VF1290 FANUC electric cabinet



Electric cabinet has an excellent tightness, detaching strong and feeble electricity signal, all signal cables are shielded in order to exclude the outside interference and keep the signal transmission stable.

## VF1290A/B MITSUBISHI electric cabinet



Electric cabinet has an excellent tightness, detaching strong and feeble electricity signal, all signal cables are shielded in order to exclude the outside interference and keep the signal transmission stable.

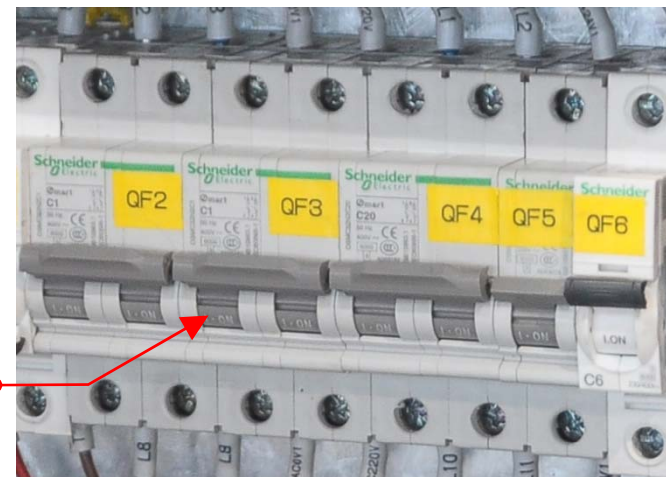
## Main electrical components in electric cabinet

OMRON middle relay  
from Japan



Schneider AC  
contactor from  
France

Schneider circuit  
breaker from France



## Personalized operation panel TOSOKU hand wheel form Japan



Apply the excellent durable CYCLE START and FEED HOLD buttons to guarantee the service life.

Iron chips-proof and oil-proof frame design for each buttons, every buttons are convenient to replace.



EMG button

Enable button

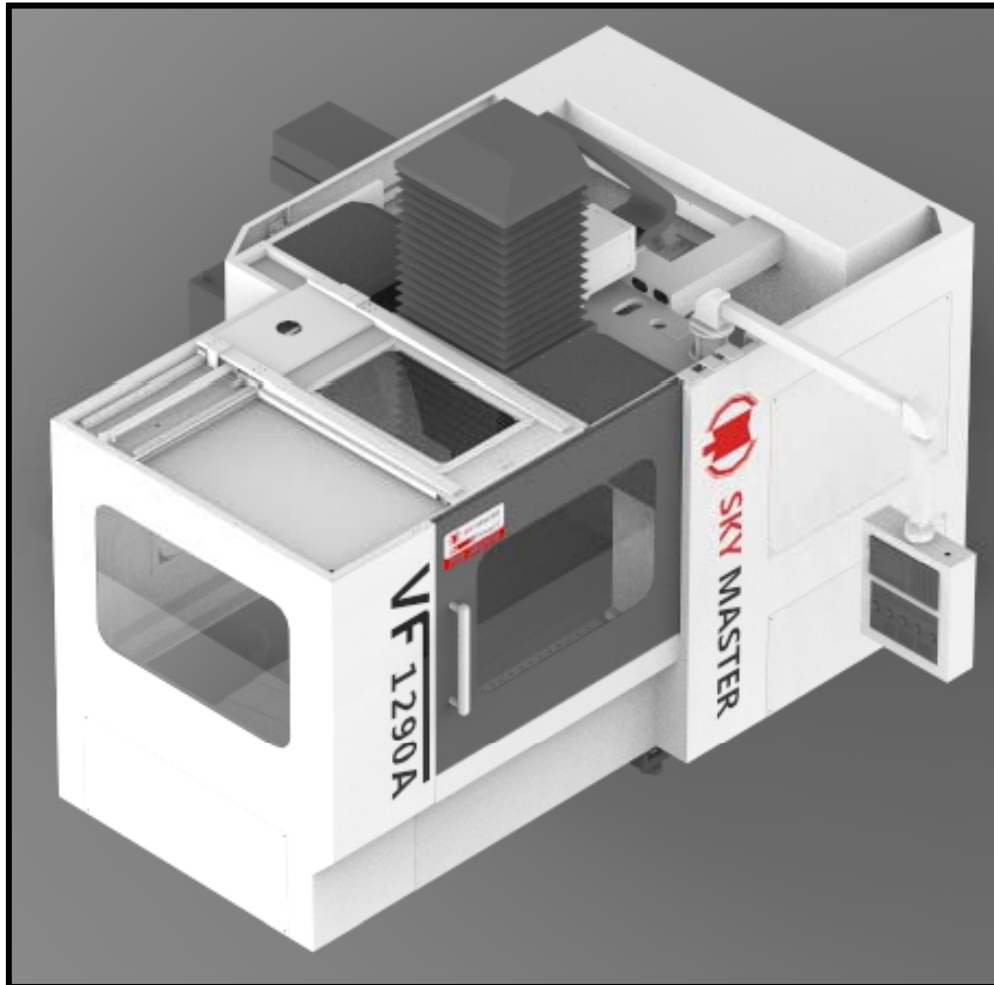
Conform to national safety standard , equipped with EMG and enable buttons.

# Advantage configuration

No.	Name	Specification	Quant.	Remarks
1	Control system	Mitsubishi M730VW	1set	MITSUBISHI(Japan)
2	Ball screw bearing	35TAC72BSUC10PN7B	17sets	NSK(Japan)
3	X axis ball screw	Dia. 50mm , pitch 16mm , precise grade	1set	PMI ( Taiwan )
4	Y axis ball screw	Dia. 40mm , pitch 16mm , precise grade	1set	PMI ( Taiwan )
5	Z axis ball screw	Dia. 40mm , pitch 16mm , precise grade	1set	PMI ( Taiwan )
6	X/Y axis linear guide way	45mm heavy loading ball type	2sets	REXROTH(Germany)
7	Z axis linear guide way	35mm heavy loading ball type	1set	REXROTH(Germany)
8	Spindle system	Direct driven HSK-A63-15000rpm	1set	SETCO ( USA )
		Build-in HSK-A63-24000rpm	1set	IBAG(Switzerland)
		Build-in HSK-E50-36000rpm	1set	IBAG(Switzerland)
9	Spindle bearing lubrication system	AMZ-Ⅲ-23 (including accessories)	1set	LUBE(Japan)
10	Linear scale	LC195 absolute type	3sets	HEIDENHAIN(Germany)
11	Pneumatic system	AMG250C-03D and other accessories	1set	SMC(Japan)
12	Lubrication system	LCB45111R-CH (including accessories)	1set	SHOWA(Japan)
13	Organ flexible shield	织物布式风琴护罩	2sets	NAJEC(Japan)
14	Air condition	TA-15F	1pcs	TNP ( Foreign investment )
15	Spindle chiller	TO-10PT	1pcs	TNP ( Foreign investment )
16	Spindle water cooling machine	TW-45PT	1pcs	TNP ( Foreign investment )
17	X axis drag chain	1500.038.038.0×37节+14038.12PZB	1set	IGUS(Germany)
18	Y axis drag chain	3500.250.100.0×16节+3250.12PZB	1set	IGUS(Germany)
19	Z axis drag chain	3500.200.075.0×17节+3200.12PZB	2set	IGUS(Germany)
20	膜片式联轴器	RADEX-NC35-DK/φ35-φ32	3sets	KTR(Germany)
21	Operation box components	XQ15SL35-026	1set	MECANO ( Germany )
22	Cutting water pump	CDLKF4-50/5 (3/PE, AC220V, 50Hz)	1set	CNP ( Foreign investment )
23	Chain chip conveyor	TR01A00170	1set	KEYARROW ( Taiwan )
24	Relay			OMRON(Japan)
25	Alternating current contactor			SCHNEIDER ( France )
26	Breaker			SCHNEIDER ( France )

※ We reserve the right to change technical parameter for improvement of our products without giving notice to customers.

## Protection guard feature



Equip with full-enclosed splash guard

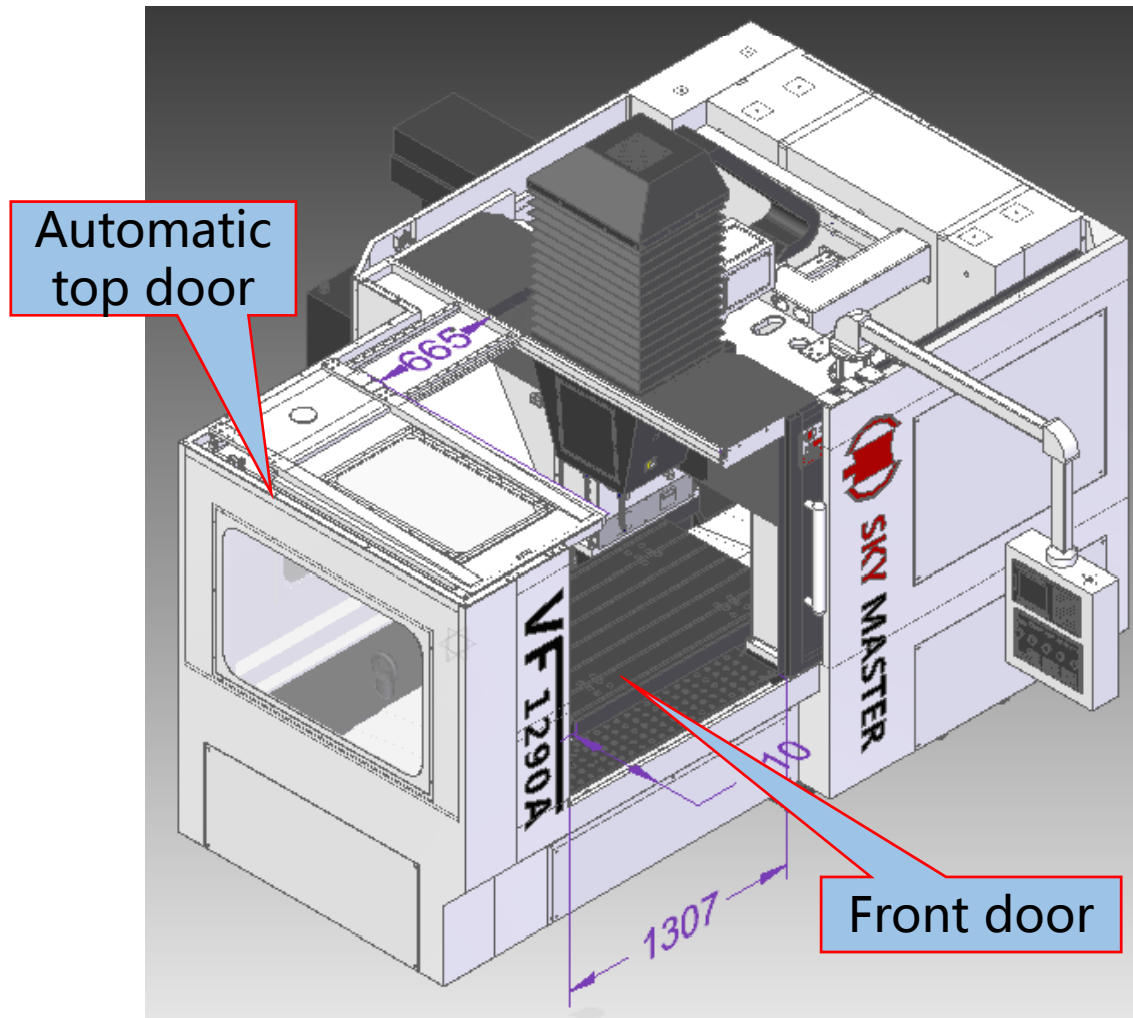
- ◆ Safety
- ◆ Elegant
- ◆ Convenient and speedy operation

★ There are extra large windows at the front and the side of the machine, ensure good visibility of the machining area

★ The footprint of the machine is quite small, no need to disassemble when delivery



## Protection guard feature

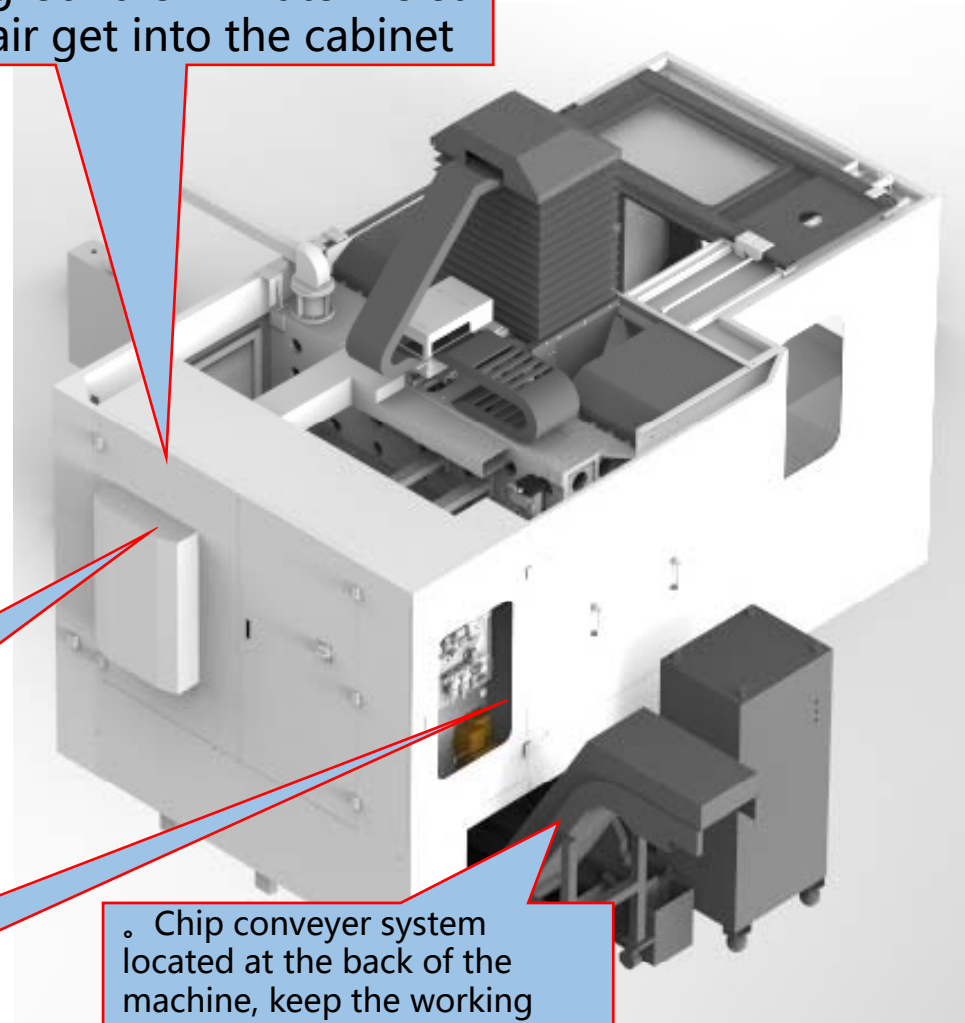


- ★ A automatic protection door was installed on the top of the worktable, can be controlled by the operation panel, clever designed, run smoothly
- ★ protection guard of the machine use a humanization type of design, easy for operator to load or unload the work piece and change tools

## Protection guard feature



Keep the electrical cabinet above the ground eliminate moist air get into the cabinet

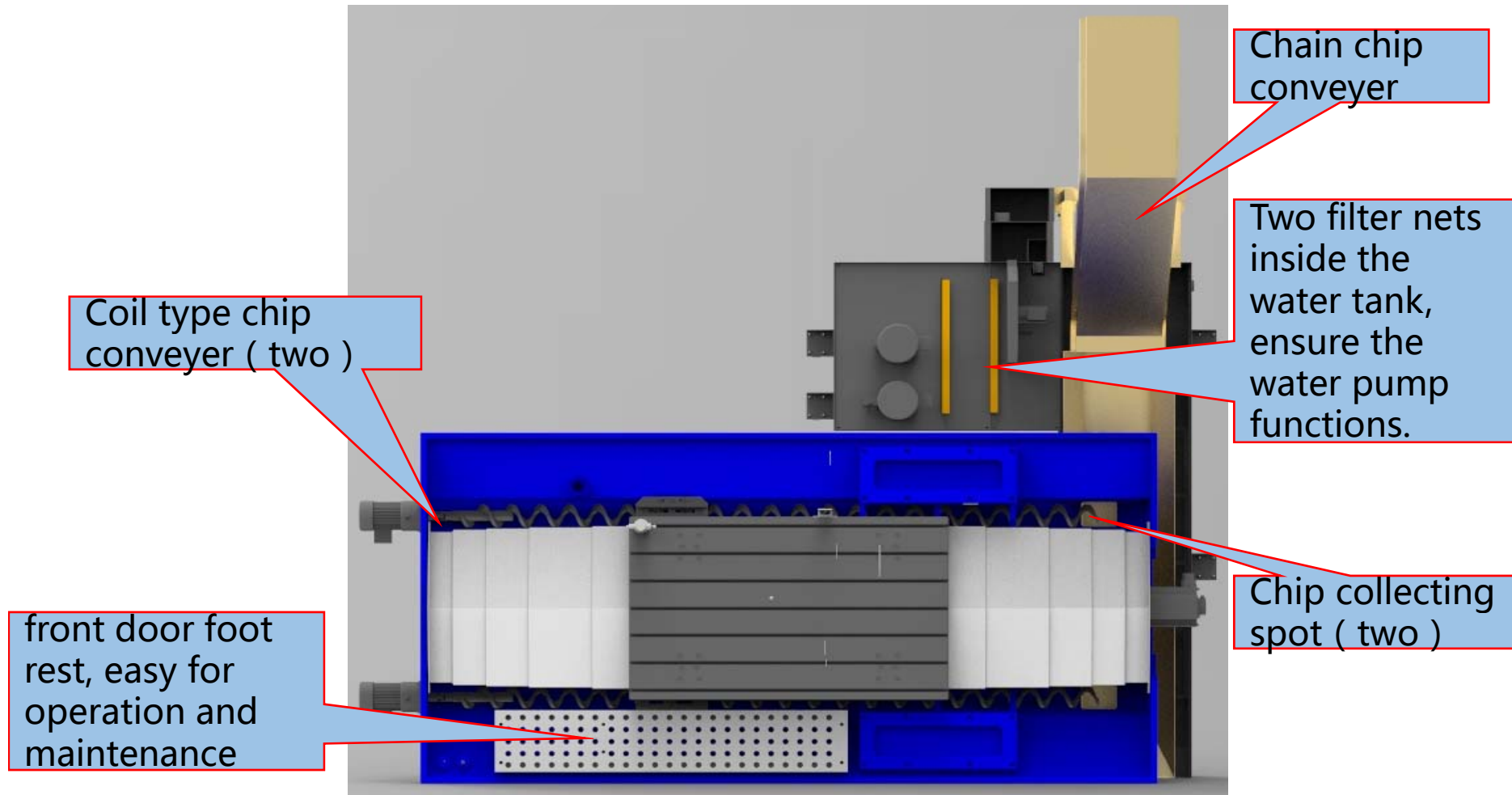


The AC can transfer the heat from electric cabinet rapidly, extend the service life of the electric components

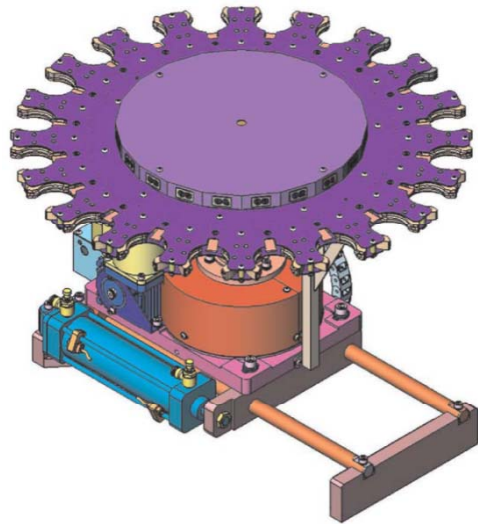
Pneumatic and lubrication unit ,easy to observe and maintenance

◦ Chip conveyer system located at the back of the machine, keep the working environment clean and comfortable

## Protection guard feature

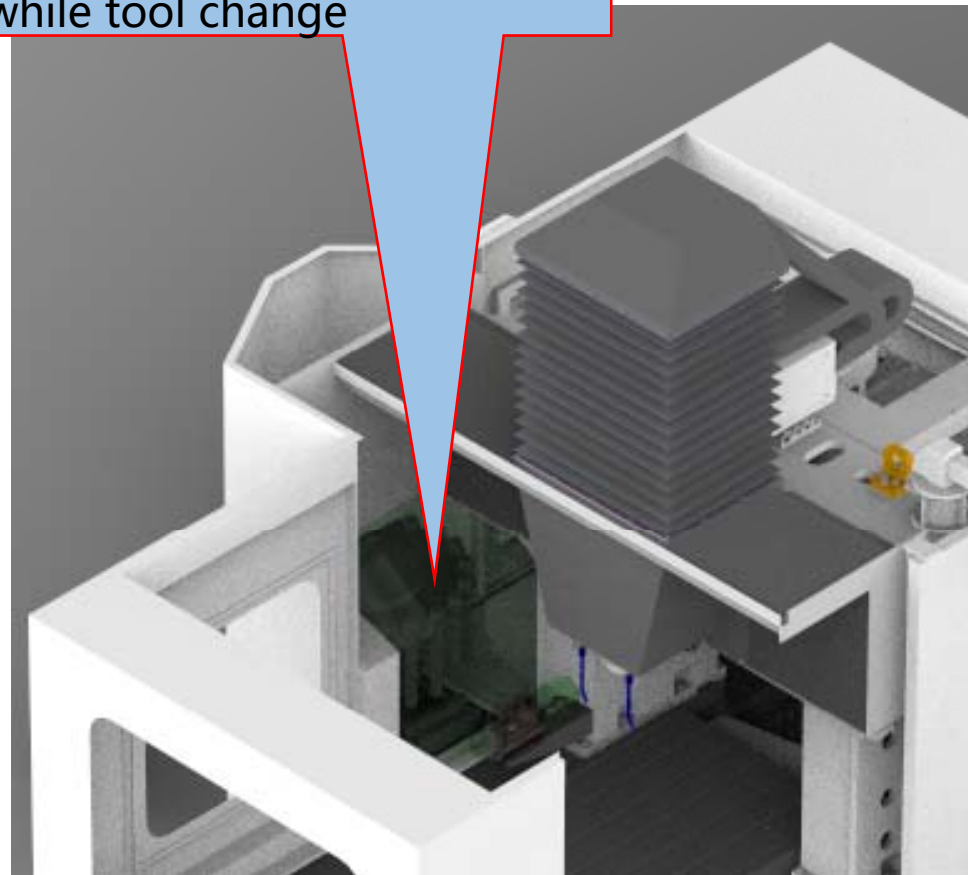


## Option-ATC



SJ-ATC (Taiwan) direct imported. The tool magazine has tool capacity of 20 or 24 , the maximum diameter of the tool is  $\phi 130\text{mm}$  , can choose the tool both clockwise or anti-clockwise

Tool magazine automatic door, can open automatically while tool change



## Option-Measuring accessory

Tool setting  
gauge protection  
cover

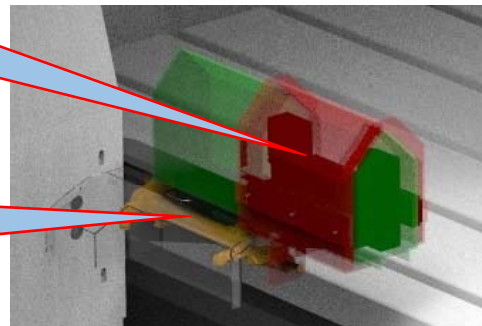


Aluminum  
support rack, light  
and nice looking

Japan Metrol  
contact type  
tool set

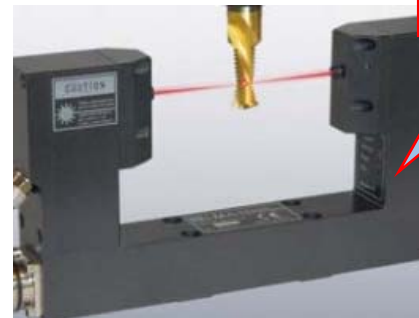


Automatic  
door for tool  
setting gauge



Air cylinder for  
tool setting  
gauge

BLUW (German)  
laser tool setting  
gauge



## Option-Oil mist recycle machine

LOSMA (Italy) oil mist recycle machine, have special designed turbine can suck the oil mist and other pollutant within the working environment, then use centrifugal machine to liquefy the oil mist, then use oil outlet system to reuse the oil

There is a filter device built in can absorb micro pollutant molecules, stop pollutant rerelease to the working environment, provide a comfortable working environment for workers.



## VF1290 Standard

1	FANUC 0i MF absolute type	14	Lubrication system
2	Fine quality machining package a ) AICC II b ) Jerk control c ) Smooth tolerance control d ) Machining quality level adjustment function	15	Spindle cooling by external pipe
3	3 colors warning light	16	Air blowing device
4	Working area light	17	Pneumatic system
5	Portable MPG	18	Coolant system
6	Ethernet DNC machining	19	Water gun/air gun with flushing function
7	Automatically power off	20	Full enclosed splash guard with top cover
8	Transformer	21	Oil and water separator machine
9	Door interlock	22	Adjustable level bolts and foundation blocks
10	Spindle air sealing	23	A/C for electric cabinet
11	Direct driven spindle 15000rpm HSK-A63	24	Chain chip conveyor
12	Spindle chiller	25	Coil chip conveyor
13	Rigid tapping	26	Tool box

## Option

1	Heidenhain TNC620
2	Linear scale (Heidenhain)
3	Voltage stabilizer
4	Tool measuring system
5	Workpiece measuring system
6	Direct driven spindle 15000rpm BBT40
7	Build-in spindle 15000rpm HSK-A63
8	Coolant through spindle center
9	4 <sup>th</sup> axis
10	Drum type ATC
11	Oil mist recycle machine
12	Air dryer

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## VF1290A/B Standard

1	Mitsubishi M730VW	18	Build-in spindle 24000rpm HSK-A63
2	Linear scale	19	Build-in spindle 36000rpm HSK-E50
3	3 colors warning light	20	Air blowing device
4	Working area light	21	Pneumatic system
5	最小指令单位1nm	22	Coolant system
6	硬盘运转	23	Spindle chiller
7	Automatically power off	24	Lubrication system
8	高速高精度控制2	25	Spindle cooling by external pipe
9	Door interlock	26	Water gun/air gun with flushing blocks
10	3D立体程式核对	27	Full enclosed splash guard with top cover
11	SSS control	28	Oil and water separator machine
12	NURBS compensation	29	Adjustable level bolts and foundation blocks
13	Spindle air sealing	30	A/C for electric cabinet
14	三维坐标转换	31	Air dryer
15	OMR II	32	Chain chip conveyor
16	OMR-FF	33	Coil chip conveyor
17	Rigid tapping	34	Tool box

## Option

1	Heidenhain TNC620
2	Voltage stabilizer
3	Tool measuring system
4	Workpiece measuring system
5	Spindle displacement sensor of temperature compensation
6	4 <sup>th</sup> axis
7	Drum type ATC
8	Oil mist recycle machine
9	



# Application field

wildly use for car component manufacture and high precision mould



Benz testing part : Inspect the all kinds of accuracy indication and dynamic precision



Gear mould: has deep and steep surface, shows the climbing ability and front & back reaction time while machining



Blowing mould : show the perfect connecting between deep slot curve surface and side wall, also shows the precise & smooth transition of the tool path



Car's light cover mould: the tool path goes up & down also turns continuously within few millimeters of range, the tool diameter is 0.5 can ensure the surface smoothness, the rotate speed of the spindle can reach 20000rpm



压铸Die casting mould: larger mould will use larger tool to machine. The feeding speed can be increased while the spindle rotate speed is not too high, the mirror like effect can be achieved this way.

## Application field

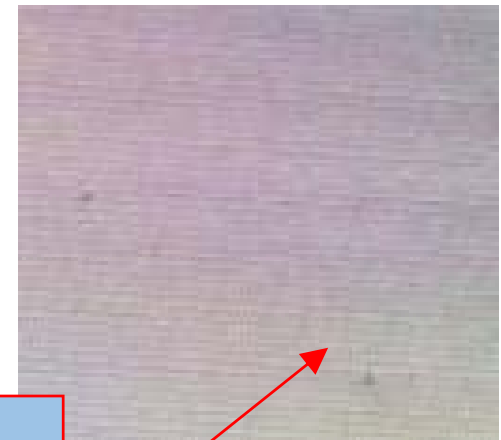
the surface of the mould is blurry and the grains are not clear when use regular cutting fluid

SkyMaster strongly recommend BLASER from Switzerland s the cutting fluid for our high speed VF series

- ◆ BLASER cutting fluid can improve the surface smoothness of the mould ;
- ◆ BLASER cutting fluid can extend the service time of the cutting tool ;
- ◆ BLASER cutting fluid is the most suitable cutting fluid for our machine

We recommend Swiss BLASER brand cutting fluid for precision molding customers

The mould 's surface is shiner, grains are beater when Swiss BLASER brand cutting fluid being used



# THANKS

SKY MASTER- KRAFT



Many thanks for your time for SKYMASTER  
PPT introduction

**※ We reserve the right to change technical parameter for improvement of our products without giving notice to customers.**