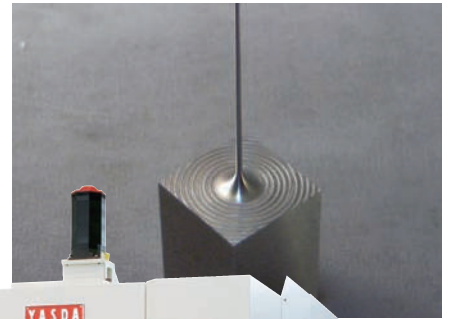
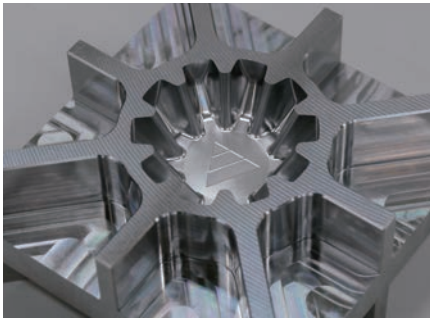


Higher accuracy produces greater profitability

YASDA CNC JIGBORER

V-series



Mold & Die Miller

New technology · High speed hard milling

YBM640V Ver.IV

YBM950V Ver.IV

YBM9150V Ver.II



YBM950V Ver.IV

Combination of traditional manufacturing and cutting-edge IT technology

The V series leading the market of high precision machines, is further increasing its performance with the newest software.

EZ Operation



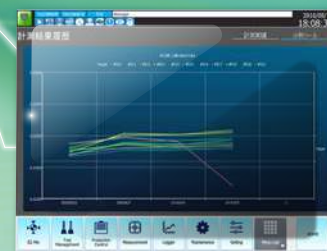
HMI (Human Machine Interface) realizes intuitive operational feeling just like a smartphone.

OpenNe Version 2.0

Self Diagnosis



Proprietary monitoring algorithms ensure appropriate diagnosis results without inefficiency or waste.



EdgeComputing

Collects a variety of information during operation. Realizes advanced interoperability.

Extensive software supports high precision machining

EZ-Me

Contacts a touch probe with an object by handle operation to automatically start measurement.



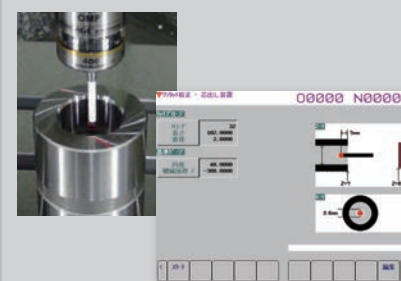
EZ-CAL

Ensures accuracy of workpiece coordinate setting on a Z-axis by measuring and using the length of the touch probe.



One-touch calibration

Easy calibration of measuring equipment on the OpenNe screen. Reduces calibration time and increases efficiency.

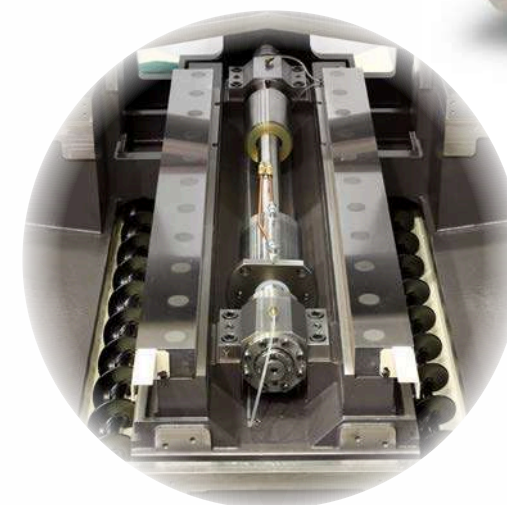


V-series

YBM640V Ver.IV / **950V** Ver.IV / **9150V** Ver.II

Equipped with YASDA's proprietary advanced technology

The CNC JIGBORER "V" series has evolved as requirements have changed over time. Equipped with YASDA's proprietary technology including high rigidity construction, the preload self-adjusting spindle and the thermal distortion stabilizing system, the V series realized ultimate high precision machining. Newly installed advanced software and a high performance measurement system takes high precision machining to a whole new level.



- Equipped with a highly rigid "preload self-adjusting spindle" realizes both heavy cutting and high surface quality machining.
- The "thermal distortion stabilizing system" minimizes thermal distortion of the machine body and allows for stable high-precision machining over long hours.
- Equipped with the high-precision interpolation function "HAS-4 (High Accurate & Speedy machining system)," this function accurately reflects high quality NC data on machining to realize high precision and high-speed machining.

Further improve high precision and high speed machining capability of the machines leading the market.

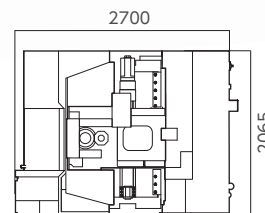
YBM640V Ver.IV

The YASDA CNC JIGBORER YBM640V Ver. IV demonstrates superior performance in die and mold machining including high precision contouring machining and adequately meeting advanced requirements.

Travel(X × Y × Z)	600 × 400 × 350
Table working surface	700 × 450
Loading capacity	300kg

ISO 230-2(1988)	unit (mm)
Accuracy : A	X:0.0018 Y:0.0016 Z:0.0023

ISO 230-2(2014)	
Accuracy : A	X:0.0015 Y:0.0013 Z:0.0019
Repeatability:R	X:0.0005 Y:0.0003 Z:0.0006



OUTLINE unit:mm
M/C HEIGHT(F.L.): 3100



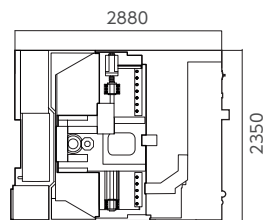
YBM950V Ver.IV

The YASDA CNC JIGBORER YBM950V Ver. IV meets a wide range of user needs offering automatic pallet changer and preload stand as options allowing for unmanned operation for extended periods of time.

Travel(X × Y × Z)	900 × 500 × 350
Table working surface	1000 × 500
Loading capacity	800kg

ISO 230-2(1988)	unit (mm)
Accuracy : A	X:0.0027 Y:0.0014 Z:0.0019

ISO 230-2(2014)	
Accuracy : A	X:0.0022 Y:0.0011 Z:0.0015
Repeatability:R	X:0.0008 Y:0.0004 Z:0.0004



OUTLINE unit:mm
M/C HEIGHT(F.L.): 3225



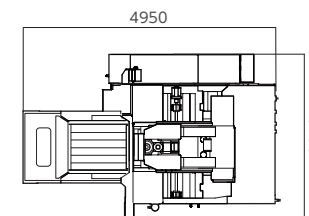
YBM9150V Ver.II

The YASDA CNC JIGBORER YBM9150V Ver. II with larger table allows for the wider range of workpieces.

Travel(X × Y × Z)	1500 × 900 × 450
Table working surface	1500 × 900
Loading capacity	3000kg

ISO 230-2(1988)	unit (mm)
Accuracy : A	X:0.0026 Y:0.0016 Z:0.0017

ISO 230-2(2014)	
Accuracy : A	X:0.0020 Y:0.0013 Z:0.0013
Repeatability:R	X:0.0010 Y:0.0006 Z:0.0008



OUTLINE unit:mm
M/C HEIGHT(F.L.): 3385



Common specifications

- Spindle speed range/100~24,000min⁻¹
- Spindle taper hole/7/24 taper No.40
- Spindle nose surface/BIG plus spindle
- Rapid traverse rate/20,000mm/min(XYZ)

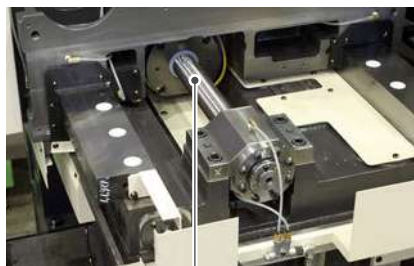


Framework structured in highly rigid symmetric bridge type

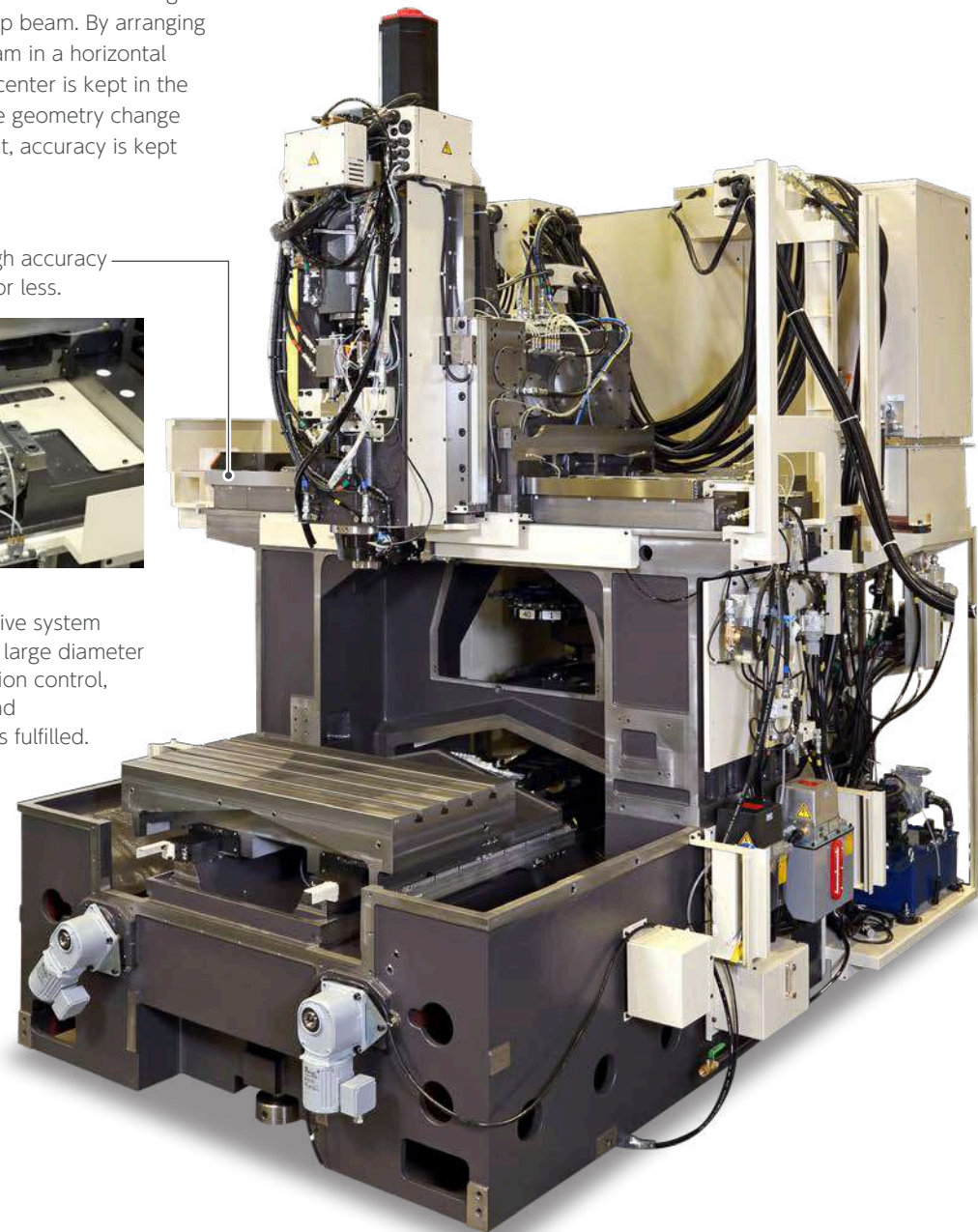
The highly rigid integrated bridge structure dominates the field of ultrahigh precision and heavy cutting

The machine body made of high grade cast-iron adopts a bridge type thermally symmetrical structure with less thermal displacement, and improves the rigidity with a monolithic bridge integrating column and top beam. By arranging the saddle on the top beam in a horizontal manner so as the gravity center is kept in the top beam and to minimize geometry change avoiding torsional moment, accuracy is kept stable over a long period.

Guideway fastened for high accuracy with straightness of 2μm or less.



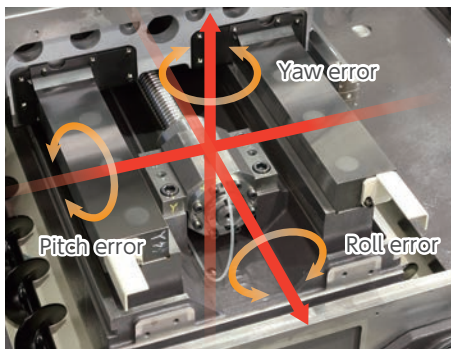
With a highly rigid feed drive system adopting ball screws with large diameter and high speed interpolation control, demand for high-speed and high-precision machining is fulfilled.



YASDA's traditional manufacturing

Attachment of a highly straight guideway to an extremely flat mounting surface

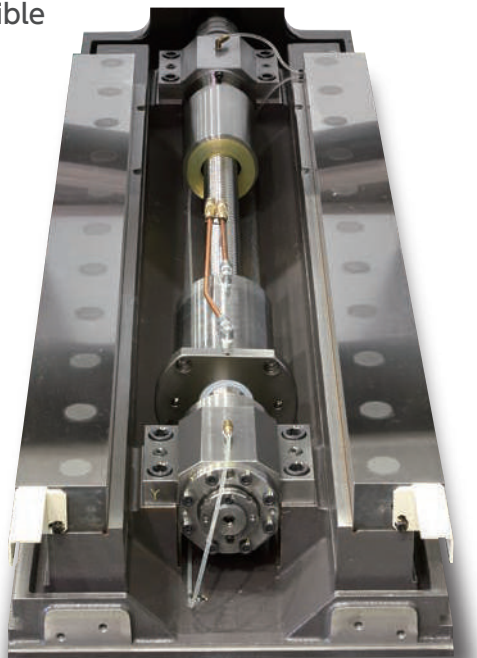
Precisely ground guideway is fastened to a hand scraped mounting surface after lapping. In order to minimize roll error, pitch error, and yaw error of each guideway, high straightness and geometric accuracy are ensured by repeated straightness measurement, guideway removal and re-scraping of the mounting surface.



By fastening components without stress, a long service life is realized minimizing aged deterioration and maintaining high accuracy.

Challenges the areas where machining alone is impossible

All of YASDA's products are manufactured through a highly collaborative effort of design, manufacturing and measurement. Technical symbols of YASDA include, not only using the full range of cutting-edge technology and pursuing product performance enhancement, but also manufacturing by "scraping". Very fine errors in units of some micrometers on metal are ground by hands of experienced craftsmen while measured by ultrahigh precision measuring equipment. This cannot be realized by machining alone. Machining in ultrahigh precision areas through YASDA's "uncompromising commitment" to precision and performance.

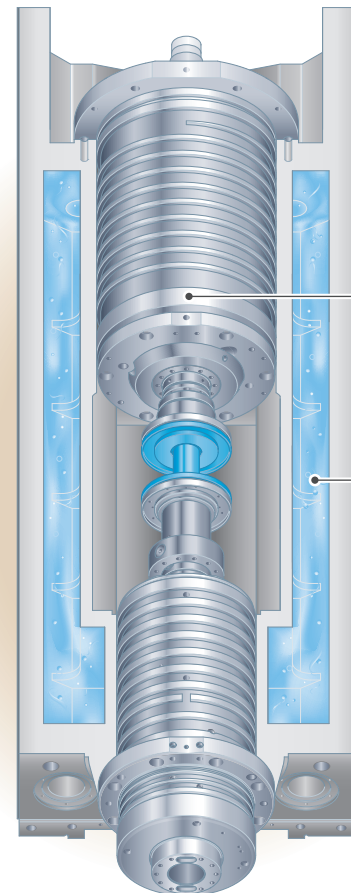


Spindles that realize stable high quality machining

The preload self-adjusting spindle that machines at high degree of accuracy through whole speed range

(MODEL:SAtype)

With a conventional fixed-position preload type spindle, as preload increases along with heat generation of the bearing by high speed spindle rotation, the initial preload is set very low. This method, however, did not satisfy spindle rigid surface requirements. The "preload self-adjusting spindle" developed by YASDA is equipped with a mechanism that applies a large preload at low speed rotation, and the preload is adjusted in accordance with the amount of heat generation of the spindle bearing at high speed rotation. Accordingly compatibility during heavy-duty cutting within a low-speed range and low heat generation and high-precision rotation within a high-speed range can be achieved. With this function, heavy-duty cutting, high-speed cutting of highly hardened steel and machining by a helical end mill that generates a thrust-reversing force can be performed with high precision.



Direct Drive System

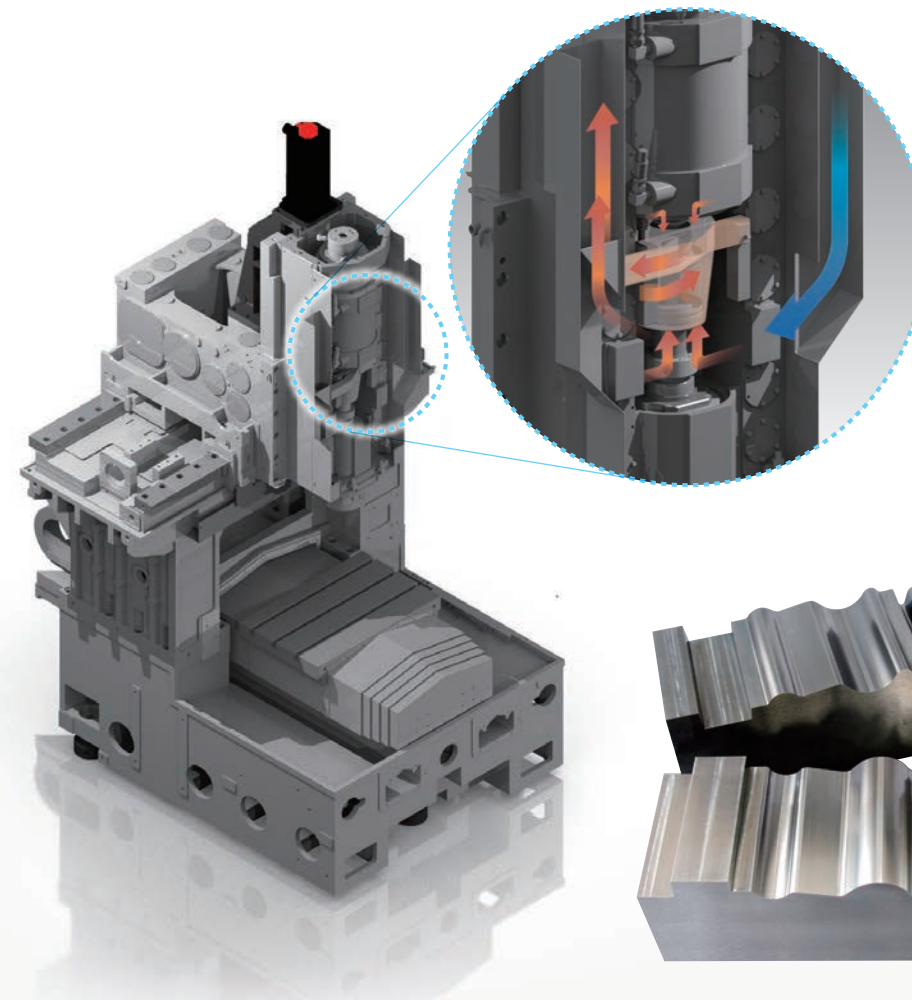
The preload self-adjusting spindle and the spindle drive motor are connected co-axially by a diaphragm coupling, in order to achieve high precision rotation of the spindle throughout the full speed range of the spindle.

Spindle motor

YASDA spindle motor employs a two coil changeover type winding, and helps high torque drive at both of high and low spindle speeds.

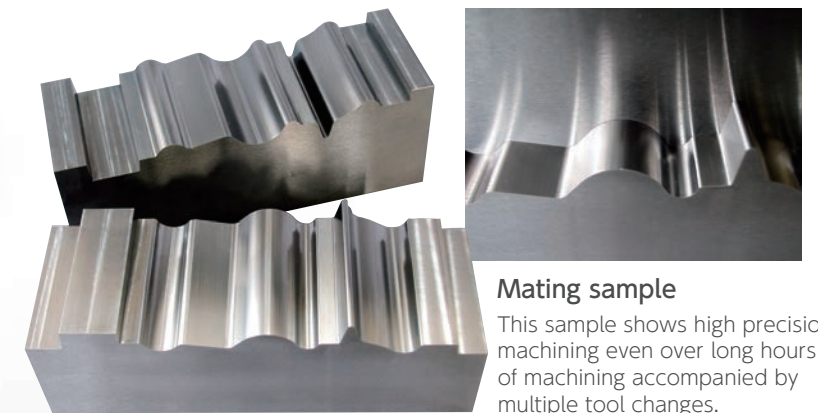
Spindle head Thermal distortion stabilizing system

The spindle head and saddle of the machine contain the largest heat generating parts such as spindle, spindle motor and feed motor. This is why machining centers suffer from thermal distortion which can easily result in inconsistent machining accuracy. YASDA's design prevents such distortion by circulating heat exchange fluid throughout the spindle head, controlling the temperature of spindle head following the sensor for reference room temperature.



Air exhaust system contributes to minimizing thermal distortion.

The spindle and spindle motor serve as major heat sources for the spindle head. These heat sources are also factors that cause adverse effects in geometric accuracy. Equipped with a system to take ambient air into the spindle head cover and efficiently exhaust the heated air retained in the cover outside of the machine, the system allows the spindle head cover to be maintained at a constant temperature inside, and also minimizes thermal distortion.

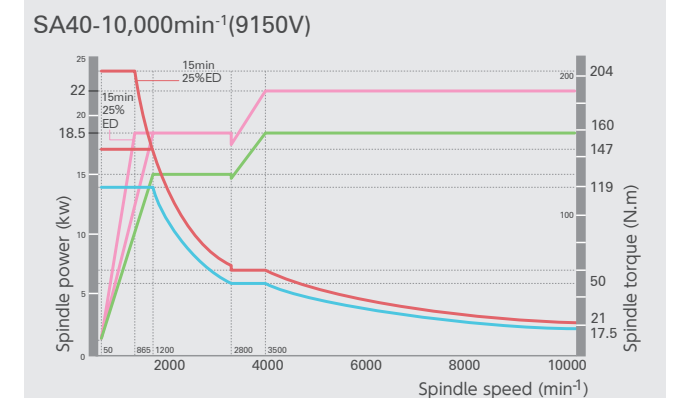
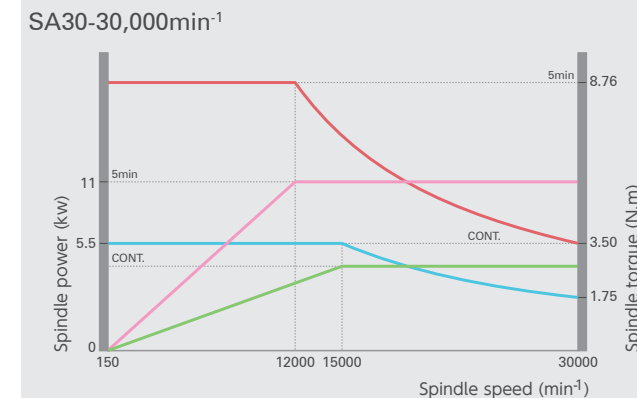
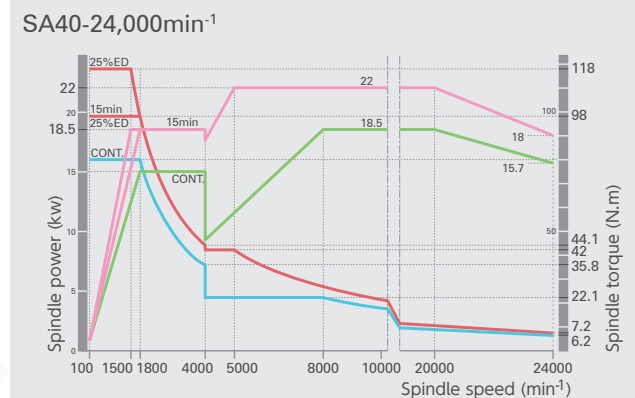


Mating sample

This sample shows high precision machining even over long hours of machining accompanied by multiple tool changes.

Spindle power and torque diagram

Power (short time) Power (Continuous)
Torque (short time) Torque (Continuous)

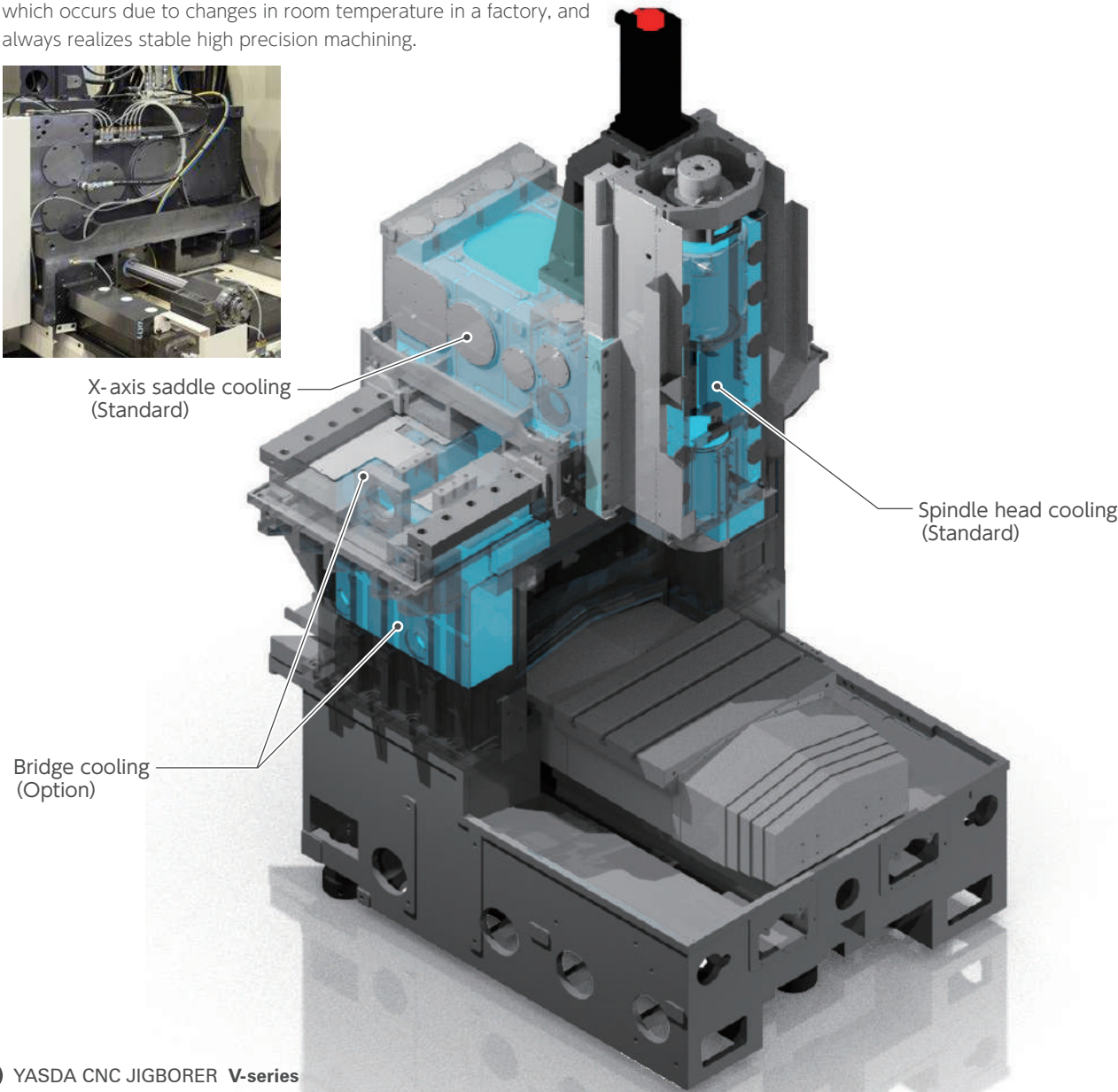


Measures against thermal displacement developed from experience and technological advancements

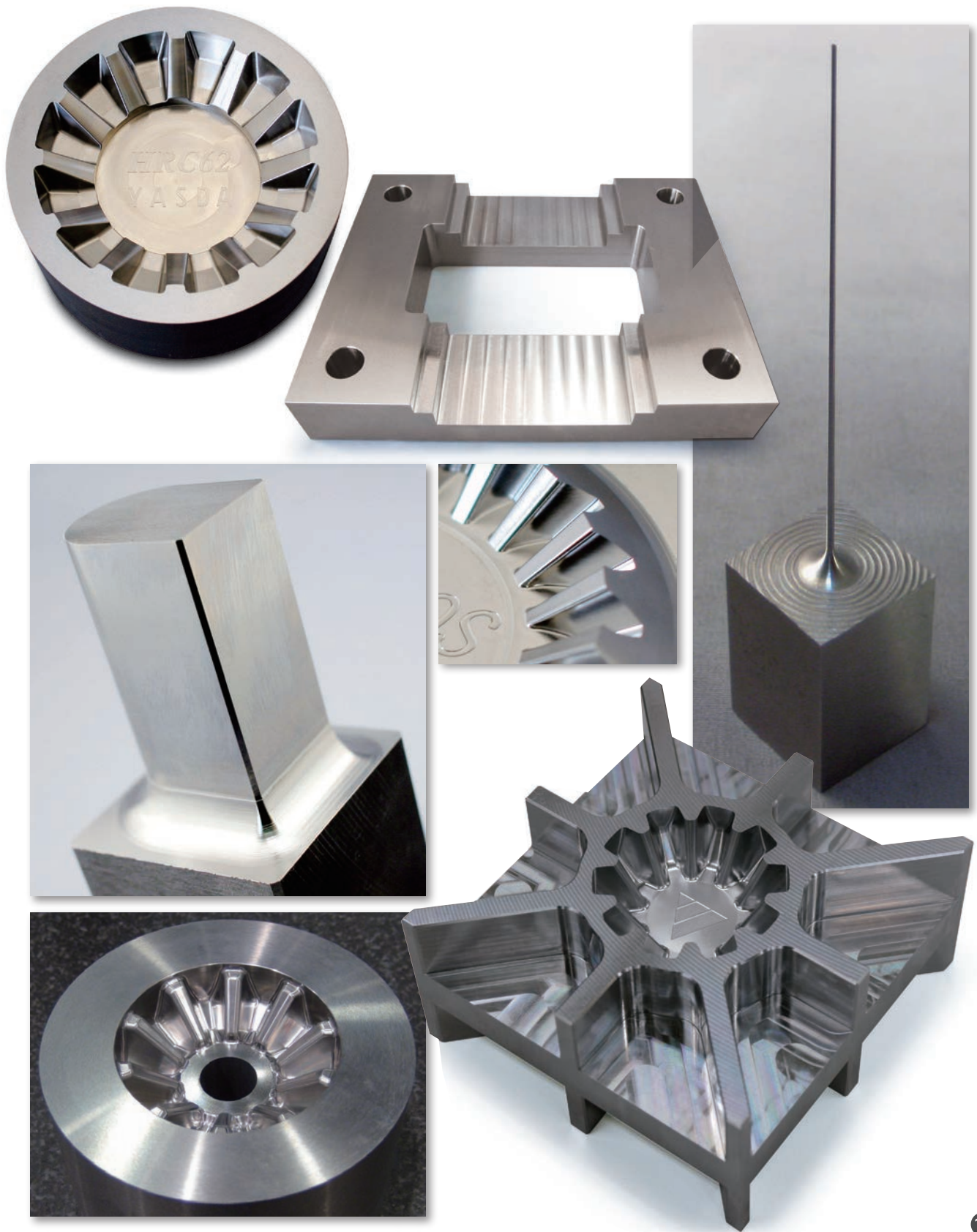
Thermal distortion stabilizing system to maintain stable high precision machining

Thermal distortion stabilizing system that blocks rapid thermal distortion

The thermal distortion of a machine and machining errors are caused by changes in a factory's environment such as rapid changes in room temperature, differences in temperature between the upper portion and lower portion of an indoor space and radiant heat from ceilings and walls. YASDA's proprietary "thermal distortion stabilizing system" circulates heat exchange oil controlled to $\pm 0.2^{\circ}\text{C}$ from room temperature through main components to prevent rapid thermal distortion of a machine's body which occurs due to changes in room temperature in a factory, and always realizes stable high precision machining.



Machining sample



Easier User Interface

Operation and functionality are improved by new FANUC iHMI

Touch-panel type 15-inch display mounted with FANUC iHMI

A large-sized display with touch panel and the OpeNe Version 2.0 provides intuitive operation.

The manual viewer makes the FANUC instruction manual and machine user manual appear on the display.



HAS-4 realizes higher speed and higher precision machining

YASDA's high-precision machining function HAS-4, essential for machining molds, has 5 basic modes (M300 to M304) including rough machining and finish machining.

It is possible to reduce machining time and improve machining accuracy by changing parameters such as acceleration/deceleration and tolerance according to machining purpose.

On the machining assist screen, it is possible to select from 5 basic machining modes and to finely adjust machining parameters for each mode according to machining conditions. It is also possible to select smoothing and other functions on the screen, thus allowing optimal conditions to be established according to each type of machining including 3D-shaped mold machining and 5-axis machining. For HAS-4, machining time is reduced by eliminating the stop time between blocks and surface quality is improved by more finely controlling servo-control feedback signals.



OpeNe serves as an intermediary between human and machine

Each function of OpeNe Version 2.0 provides the operator with complete details of the machine.



Tool Information Management



On this screen, not only basic tool information but also associated tool information such as machining load and measurement history are collectively managed. It is also possible to monitor spindle load in real time in comparison with past record data and check changes in same tool length and diameter. It is also possible to set a tool selected on the screen into the spindle (tool change) and tool measurement operation in interactive mode from the screen without program instructions.

Maintenance Management



On this screen, various data such as number of operations and running status of peripherals are automatically acquired and saved. Use of acquired data allows for planned and efficient maintenance and predictive maintenance on equipment. A check if current machine status is appropriate or not is carried out automatically by acquiring servo wave data and comparing it with past data.

Production Control



On this screen, not only machine running information but also mechanical information such as load on each axis while running, workpiece coordinates and tool compensation values are displayed. It is possible, in case of machining failure, to carry out a follow-up check because various types of mechanical information are displayed on the same time axis as that of program progress graph. It is also possible to graphically display actual machine running status on a daily, weekly and monthly basis. Machine running status data can be utilized in Excel format.

Program Management

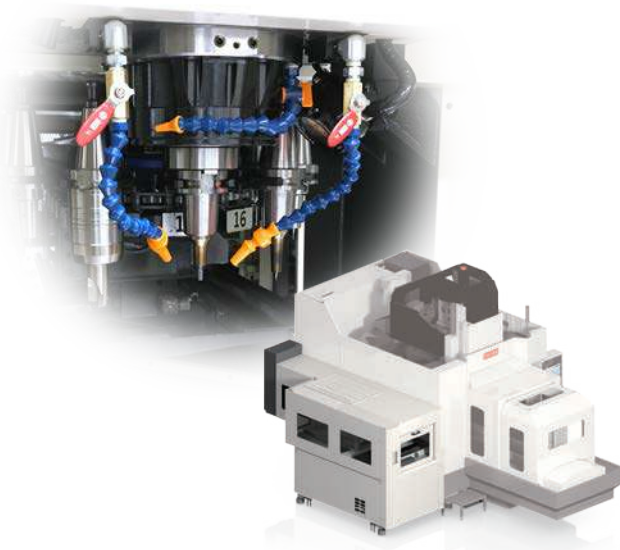


Automatic tool changer (ATC)

Allows to change No. 40 tools
employing an armless change method

Simple and highly reliable

The ATC adopts a highly reliable armless change method to directly change tools by the stroke of the tool magazine itself. The tool magazine (number of tools: 30 tools) incorporated in the machine body prevents foreign substances such as chips from entering the magazine and adhering to the tool shank by an automatic opening/closing type sealing door.

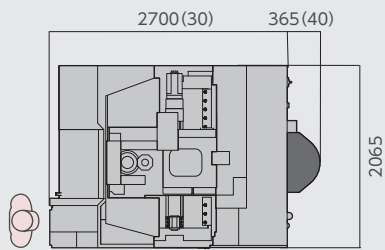


OUTLINE

unit:mm

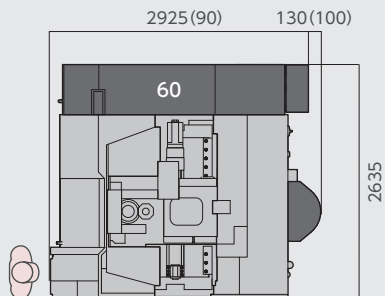
YBM640V Ver.IV

Standard 30 tools/option 40 tools



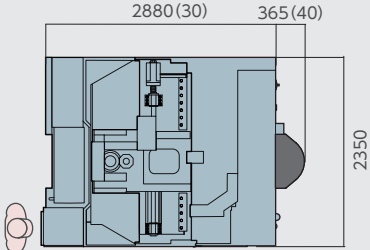
M/C HEIGHT(F.L):3100

Option
90 tools (30 tools+60 tools)
100 tools (40 tools+60 tools)



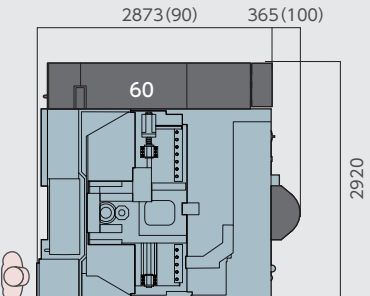
YBM950V Ver.IV

Standard 30 tools/option 40 tools



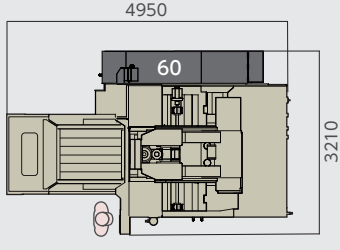
M/C HEIGHT(F.L):3225

Option
90 tools (30 tools+60 tools)
100 tools (40 tools+60 tools)



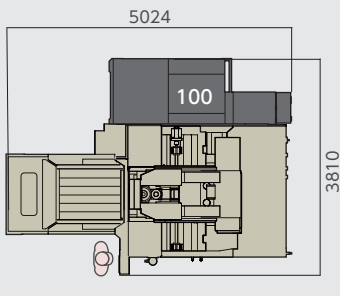
YBM9150V Ver.II

Standard 60 tools



M/C HEIGHT(F.L):3385

Option
100 tools



Automatic pallet changer (APC)

Realizes highly reliable
high precision machining even during
unmanned operation for long hours

The APC adopts YASDA's proprietary pallet chucking mechanism, and offers high repeatability and chucking rigidity which are most important in the performance of high precision machining. The preload stand (PLS) can be easily set up, and can automatically machine several kinds of different workpieces one after another. Both of YASDA's APC and PLS allows for unmanned operation with high reliability for long hours.

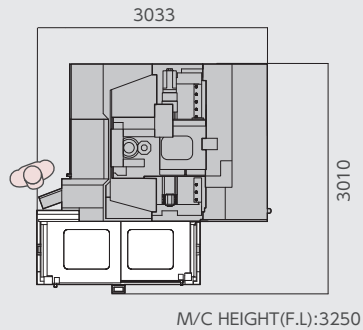


OUTLINE

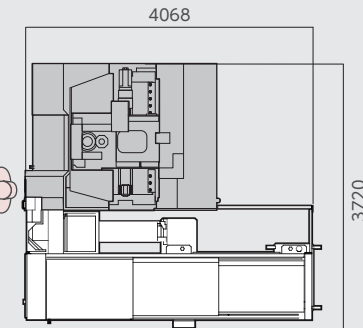
unit:mm

YBM640V Ver.IV

APC

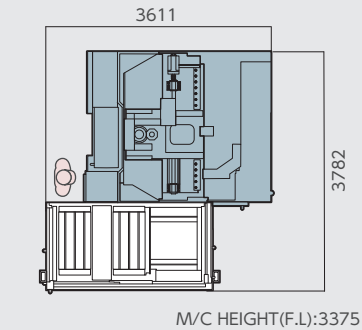


5PLS

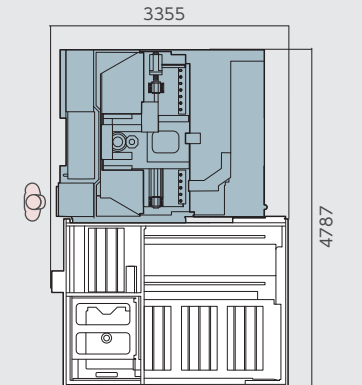


YBM950V Ver.IV

APC

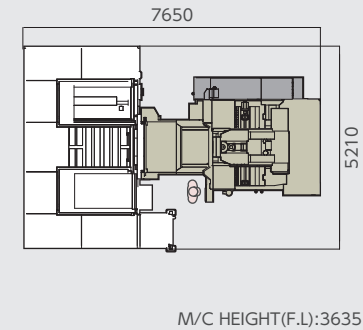


4PLS



YBM9150V Ver.II

APC



Additional 1 axis supports precise 4-axis machining Option

YASDA's 1 axis rotary table realizes highly accurate 4-axis machining.

RS 20

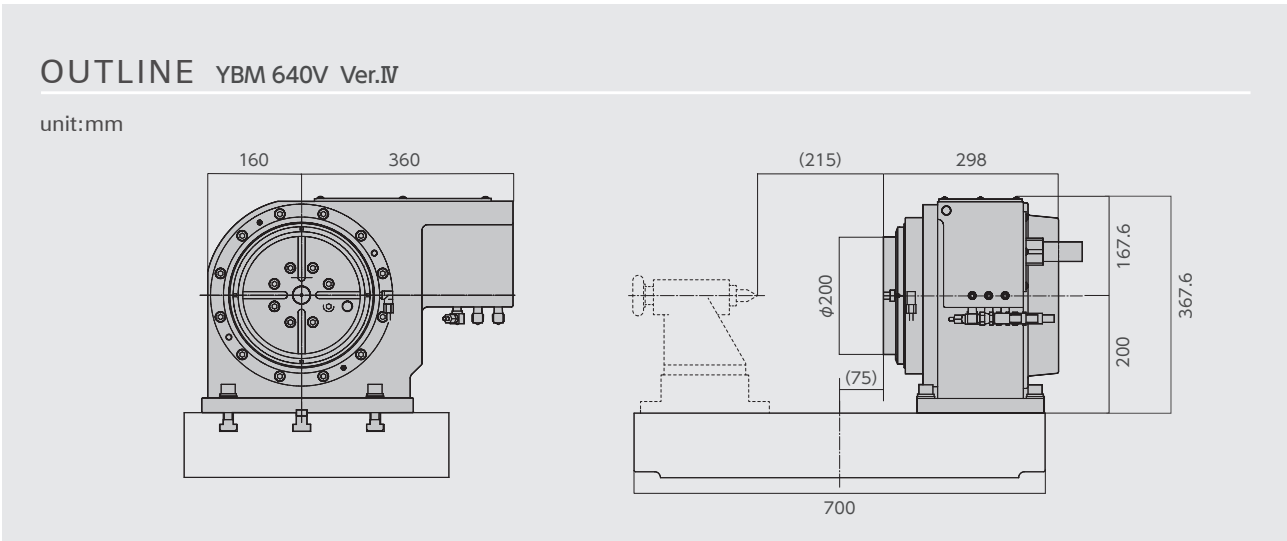
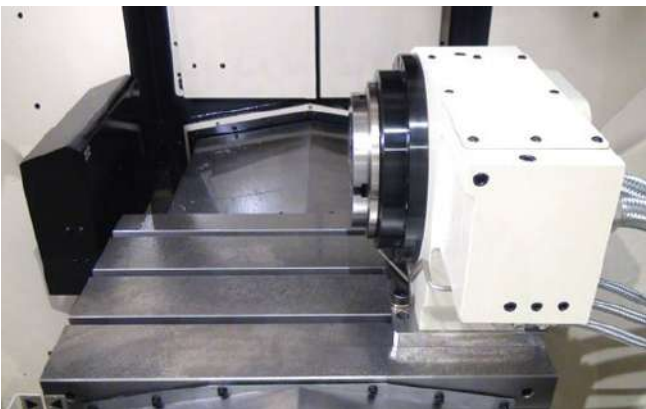
Adoption of a DD (Direct Drive) motor offers high speed and high-precision positioning.
Enables multi-face indexing machining as well as highly accurate simultaneous 4-axis machining.

Rotary axis indexing accuracy
(Measured value)
ISO 230-2(1997)

Accuracy : A	0.99sec
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RS20 specifications

Table diameter	φ200mm
Table surface configuration	4 T-slots x 90 degree pitch Slot width:12mm H8 (standard)
Table center hole diameter	φ30mmH7(Depth:10mm)
Table rotational axis travel	360° (Continuous)
Rotary table Max. rapid feed rate	150min ⁻¹
Loading capacity	40kg
Min.input	0.0001deg
Height up to table center	200mm



YASDA automation system with robots

Responds to diversified user needs

Responds to flexible system architecture

By connecting an external robot to the V series, an automation can be designed and built as well as saving space which allows for a long and stable operation. The arrangement of the machine and robot allows for free layout (right and left), and a system design of two machines with one robot can be realized.

EROWA[®]
system solutions

system 3R the Pioneer



YASDA robot schedule function allows for highly efficient operation

The YASDA robot schedule function offers two machining schedule modes “priority” and “machining sequence”. The priority mode sets the priority order group according to a numerical value. The machining sequence mode sets the machining order for each workpiece allowing for random operation. Since the machining schedule can be set flexibly, highly efficient operation can be realized according to production plans. In addition, even when there is an urgent request, it can be quickly set without editing the previously planned machining schedule.



1. Base machine specifications		640V Ver.IV	950V Ver.IV	9150V Ver.II
1) Travel	X-axis travel	600mm	900mm	1,500mm
	Y-axis travel	400mm	500mm	900mm
	Z-axis travel	350mm	350mm	450mm
	Table to spindle nose distance	150 ~ 500mm	200 ~ 550mm	150 ~ 600mm
2) Spindle	Spindle speed range	100 ~ 24,000min ⁻¹		
	Spindle drive motor	AC18.5 / 22kW (Continuous/15min)		
	Spindle taper hole	MAS BT40		
	Spindle nose surface	BIG plus spindle		
3) Table	Table working size	700mm×450mm	1,000mm×500mm	1,500mm×900mm
	Loading capacity	300kg	800kg	3,000kg
	Table surface configuration(width/pitch/number of T slots)	18mm/125mm/3	18mm/150mm/3	18mm/150mm/5
4) Feed rate	Rapid feed	20,000mm/min		
	Cutting feed	1 ~ 5,000mm/min		
	Min. input increment	0.0001mm		
5) ATC	Tool shank type	MAS BT40		
	Pull stud type	JIS B6339-40P		
	Tool storage capacity	30 tools	30 tools	60 tools
	Max. tool dia. / length / mass	φ100mm/250mm/7kg	φ100mm/250mm/7kg	φ100mm/300mm/7kg
6) Mass of machine		Approx.8,000kg	Approx.11,000kg	Approx.16,000kg
7) Electric power capacity		Max.39kVA	Max.39kVA	Max.41kVA
8) NC unit		FANUC 31i-B5		

2. Standard equipments		640V Ver.IV	950V Ver.IV	9150V Ver.II
1) Optical scale feed back		X-,Y-,Z-axis 0.0001mm command available		
2) Splash guard	Manual slide door with ceiling cover,1 LED light	Manual slide door with ceiling cover,1 LED light	Manual slide door with ceiling cover,1 LED light	Manual slide door with ceiling cover,2 LED lights
3) Screw conveyor	Twin screw	Twin screw	Twin screw	Twin screw
4) Thermal distortion stabilizing system				Standard type
5) Compensation for spindle thermal displacement				Standard data
6) Automatic power braker				
7) OpeNe Version2.0				

3. CNC standard options	
1) Display	15"LCD touch panel with iHMI
2) Program memory capacity	512KB(1,280m)
3) Custom macro common variable	600
4) Number of registerable programs	1,000
5) Automatic corner override	
6) Tool offset pairs	64 pairs
7) Tool offset memory	Memory C
8) Extended part program editing	
9) Back ground editing	
10) Memory card/USB memory interface	Data input/output

4. Optional equipments		640V Ver.IV	950V Ver.IV	9150V Ver.II
1) Spindle nose face configuration		HSK-A63		
2) Spindle	Spindle speed range	150 ~ 30,000min ⁻¹	150 ~ 30,000min ⁻¹	50 ~ 10,000min ⁻¹
	Spindle drive motor	AC5.5/11kW (Continuous/5min.)	AC5.5/11kW (Continuous/5min.)	AC18.5/22kW (Continuous/30min.)
	Spindle taper hole	MAS BT30	MAS BT30	MAS BT40
3) Signal tower (Multilayer signal lamp)		Red,yellow,green(Flashing)		
4) Coolant temperature controller				
5) External mist coolant		Manufactured by Bluebe / 2 nozzles		
6) Spindle center through flood coolant		Pump discharge pressure 6Mpa/3.5Mpa		
7) Spindle center through air coolant				

4. Optional equipments		640V Ver.IV	950V Ver.IV	9150V Ver.II
8) Micro fog coolant unit				
9) Oil skimmer				
10) Mist collector				
11) Tool measurement & Tool breakage detection system				NT-H(by BLUM) Dyna Vision Pro(by BIG Daishowa) Dyna Line(by BIG Daishowa)
12) Automatic workpiece measuring system				Touch prove OMP60 (by RENISHAW)
13) High-speed machining function (YASDA HAS-4 system)				With Machining support screen
14) Thermal distortion stabilizing system				With weekly timer
15) Weekly timer				
16) Compensation for spindle thermal displacement				Individual data
17) Automatic pallet changer(APC)	Unit mass	1,500kg	2,500kg	5,000kg
	Safety guard for pallet changer			
18) Preload stand (PLS)	Number of pallet stands	5 stands	4 stands	—
	Unit mass	2,500kg	3,000kg	—
	Automatic program search			—
	Safety guard for PLS			—
19) Pallet	Pallet size	500mm×400mm,600mm×400mm	900mm×500mm	900mm×1,500mm
	Pallet surface configuration type			M16 tap
	Pallet thickness	110mm	100mm	120mm
	Pallet mass	200kg	300kg	1,400kg
20) Pallet chucking system	Loading capacity	300kg	400kg	2,500kg
21) Automatic tool changer	Tool storage capacity	40,60,90,100	40,60,90,100	100
	Tool diameter/length/mass	φ100mm/250mm/7kg	φ100mm/250mm/7kg	φ100mm/300mm/7kg
22) AWC door				
23) Robot interface				Compatible with System 3R and EROWA
24) Washing gun				
25) Scraper type chip conveyor				
26) Coolant unit level switch				
27) Automatic fire-extiguishing equipment interface				

5.CNC Options	
1) Part program storage	Total: 1MB,2MB,4MB,8MB
2) Number of registerable programs	Total: 2,000,4,000
3) Helical interpolation	G02,G03
4) Inch/metric conversion	G20,G21
5) Scaling	G50,G51
6) Coordinate system rotation	G68,G69
7) Programmable mirror image	G50.1,G51.1
8) Rigid tap	M29(G84,G74)
9) Optional block skip	Total: 9
10) Tool offset pairs	Total: 99,200,400,499,999pairs
11) Addition of workpiece coordinate pair	48pairs,300pairs
12) Tool management function	
13) Normal direction control	G40.1,G41.1,G42.1
14) Cs contouring control	
15) High-speed smooth TCP	G43.4,G43.5
16) Tilted working plane command with guidance	G68.2,G69,G53.1
17) Workpiece setting error compensation	G54.4Pn
18) Ethernet function	FOCAS2/Ethernet
19) Data server function	Fast data server, Capacity: 1GB,2GB,4GB,16GB,32GB



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