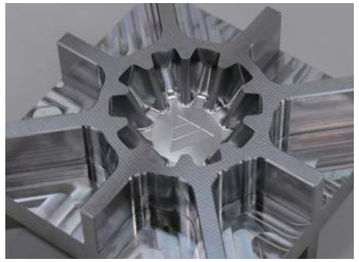
YASDA

Higher accuracy produces greater profitability

YASDA CNC JIGBORER

V-series



YBM950V Ver.Ⅳ

Mold & Die Miller

New technology・High speed hard milling

YBM640V Ver.Ⅳ

YBM950V Ver.Ⅳ

YBM9150V Ver.Ⅱ

YASDA

YASDA PRECISION TOOLS K.K. www.yasda.co.jp

Main Office & Factory:
1160Hamanaka,Satosho-cho,Okayama,719-0303,Japan
PHONE: +81/865-64-2511 FAX:+81/865-64-4535

Representative Office:
Schiessstr. 35, D-40549 Düsseldorf Germany
PHONE: +49/211-598937-40 FAX: +49/211-598937-50

YASDA PRECISION AMERICA CORPORATION
62 North Lively Boulevard, Elk Grove Village, IL 60007, U.S.A.
PHONE: +1/847-439-0201 FAX: +1/847-439-0260

YASDA PRECISION TOOLS (SHANGHAI)
Room. 1001 Orient International Plaza Part(C),
No.85 Lou Shan Guan Road, Shanghai, 200336, China
PHONE: +86/21-62700955 FAX: +86/21-62700970

Dongguan Office:
5A Xingye Building, No.89.Lianfeng Road,
Changan Town, Dongguan City, Guangdong, 523850, China
PHONE: +86/769-82283036 FAX: +86/769-82283086

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Catalog No.V-series E-01
Printed in Japan –.Dec.2017

YASDA

Combination of traditional manufacturing and cutting-edge IT technology

V-series

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

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.

OpeNe 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

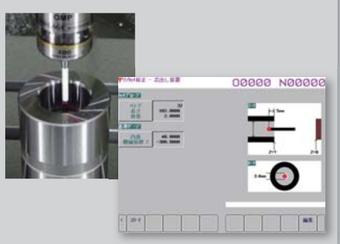
Contacts a touch probe with an object by handle operation to automatically start measurement.

EZ-CAL

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

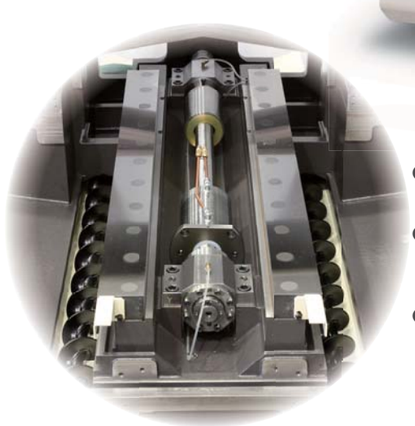
One-touch calibration

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



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.

V-series

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.

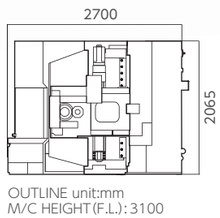
Travel(X × Y × Z)	600 × 400 × 350
Table working surface	700 × 450
Loading capacity	300kg

ISO 230-2(1988) unit(㎜)

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.

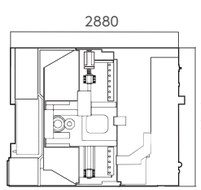
Travel(X × Y × Z)	900 × 500 × 350
Table working surface	1000 × 500
Loading capacity	800kg

ISO 230-2(1988) unit(㎜)

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.

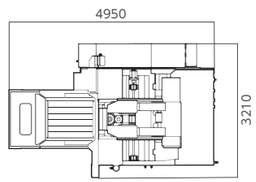
Travel(X × Y × Z)	1500 × 900 × 450
Table working surface	1500 × 900
Loading capacity	3000kg

ISO 230-2(1988) unit(㎜)

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

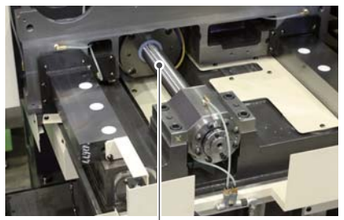
Spindle speed range／100～24,000min⁻¹
Spindle taper hole／7/24 taper No.40
Spindle end surface／BIG plus spindle
Rapid traverse rate／20,000mm/min(XYZ)

Framework structured in highly rigid symmetric bridge type

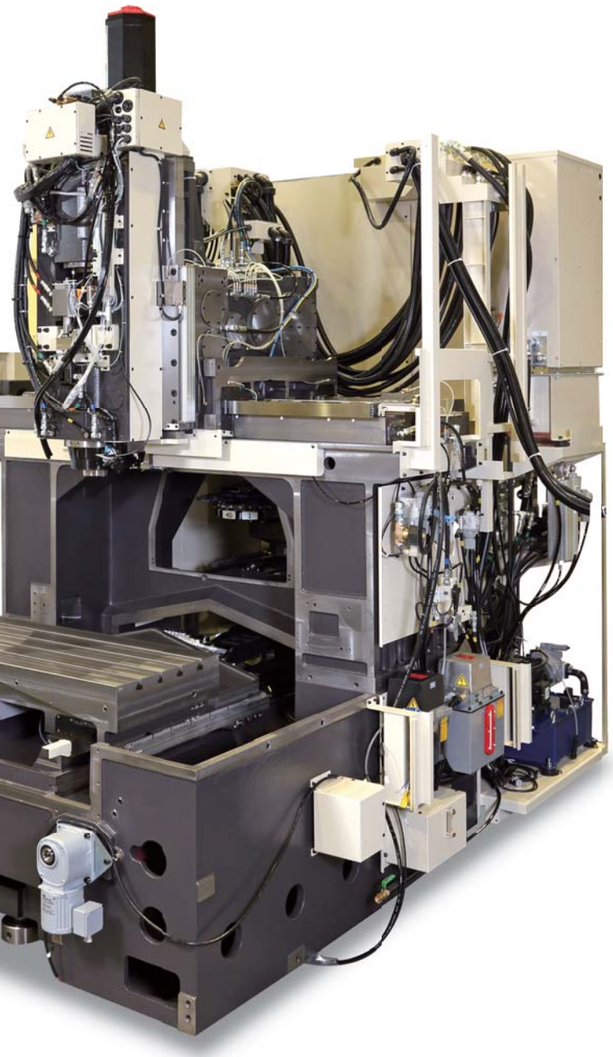
The highly rigid integrated bridge structure dominates the field of ultrahigh precision and heavy cutting

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.



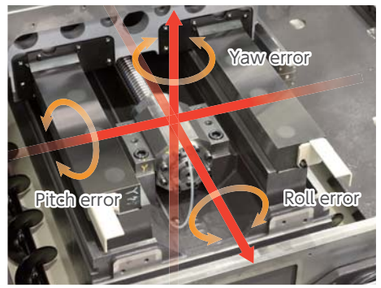
With a highly rigid feed drive system adopting ball screws with large diameter and high speed interpolation control, demand for high-speed and high-precision machining is fulfilled.



YASDA's traditional manufacturing

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

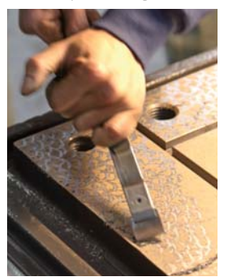
Precisely ground guideway is fastened to a hand scraped mounting surface after lapping. In order to minimize roll error, pitch error, and yaw error of each guideway, high straightness and geometric accuracy are ensured by repeated straightness measurement, guideway removal and re-scraping of the mounting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

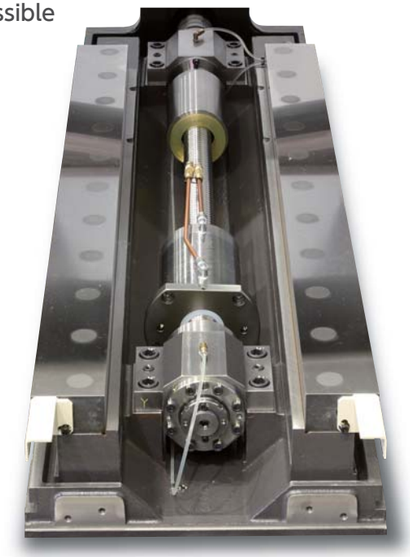


By fastening components without stress, a long service life is realized minimizing aged deterioration and maintaining high accuracy.

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.



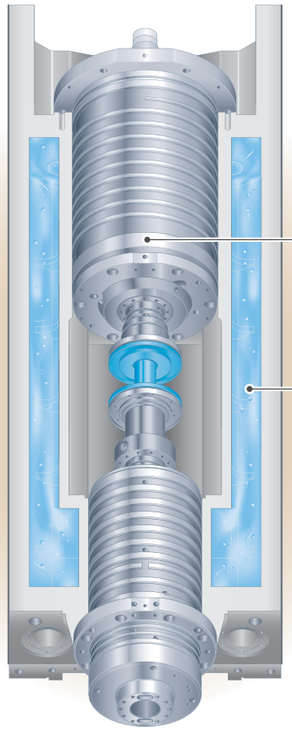


Spindles that realize stable high quality machining

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

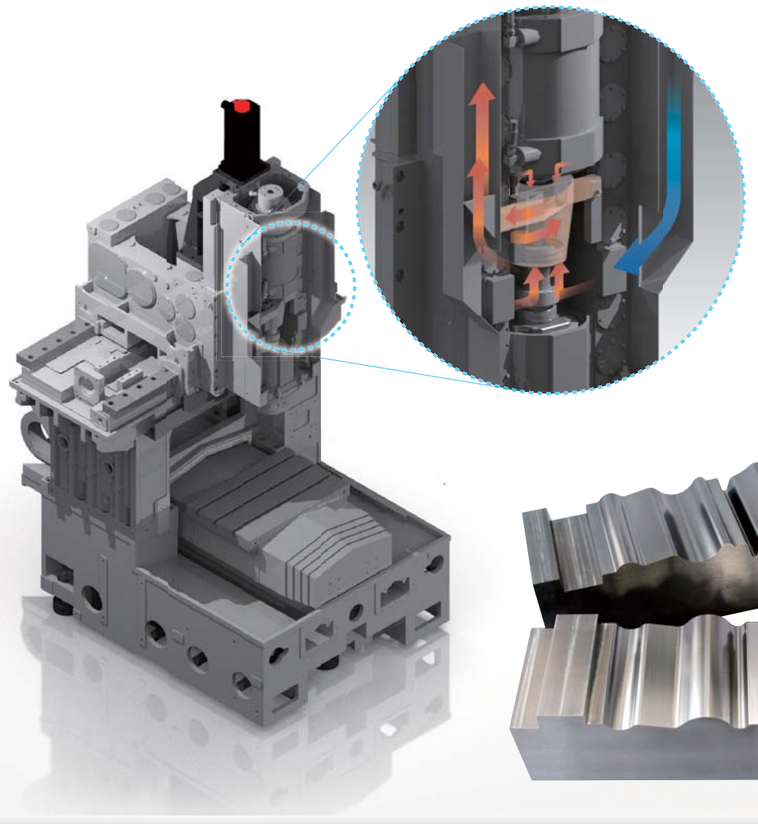
The preload self-adjusting spindle and the spindle drive motor are connected co-axially by a diaphragm coupling, in order to achieve high precision rotation of the spindle throughout the full speed range of the spindle.

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.

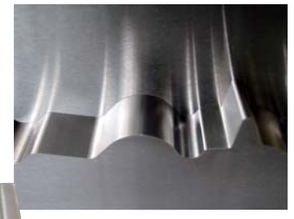
Spindle head Thermal distortion stabilizing system

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.



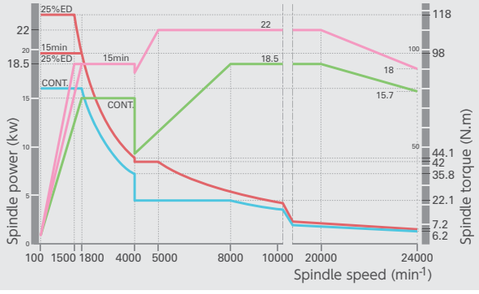
Mating sample

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

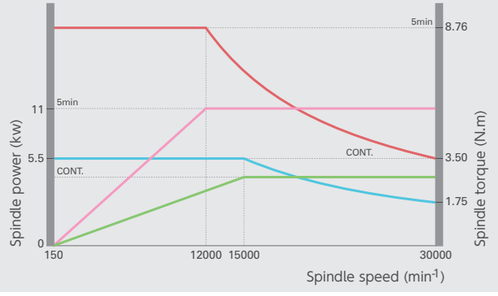
Spindle power and torque diagram

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

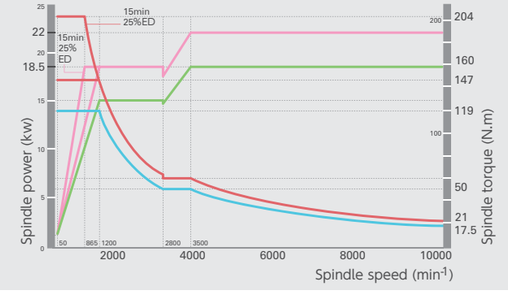
SA40-24,000min^{-1}



SA30-30,000min^{-1}



SA40-10,000min^{-1}(9150V)

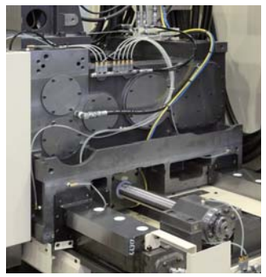


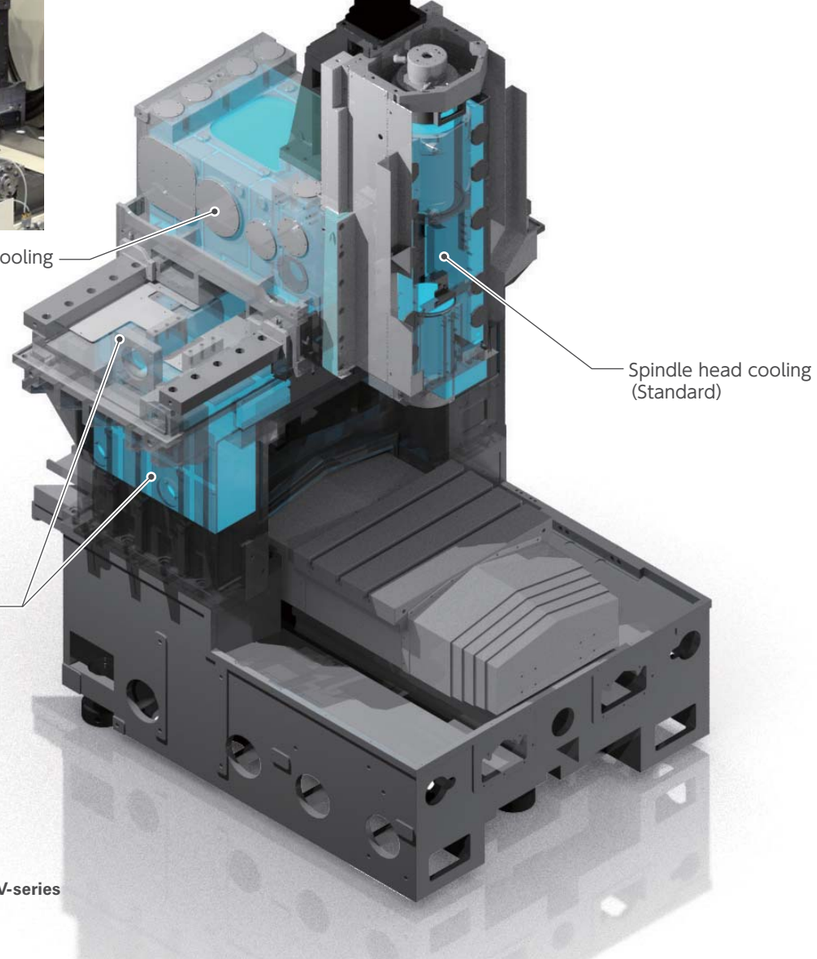
Measures against thermal displacement developed from experience and technological advancements

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 ±0.2°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

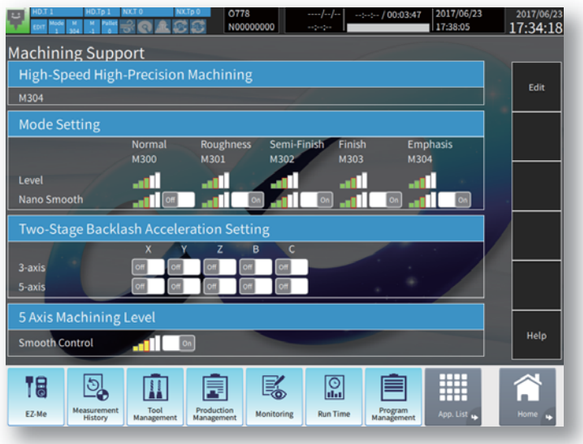
Operation and functionality are improved by new FANUC iHMI

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.

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.

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.

Program Management

On this screen, machining time for any registered program can be easily calculated by simulation even while the machine is operating.
Knowing machining end time with accuracy enables optimal utilization of equipment and smooth production.

Automatic tool changer (ATC)

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

Simple and highly reliable

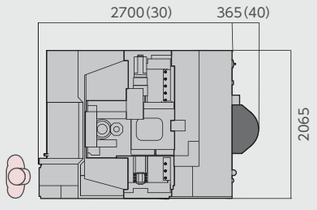
The ATC adopts a highly reliable armless change method to directly change tools by the stroke of the tool magazine itself. The tool magazine (number of tools: 30 tools) incorporated in the machine body prevents foreign substances such as chips from entering the magazine and adhering to the tool shank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

OUTLINE

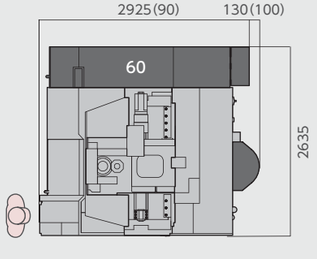
unit:mm

YBM640V Ver.Ⅳ

Standard 30 tools/option 40 tools

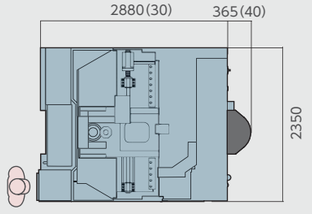


Option
90 tools (30 tools+60 tools)
100 tools (40 tools+60 tools)

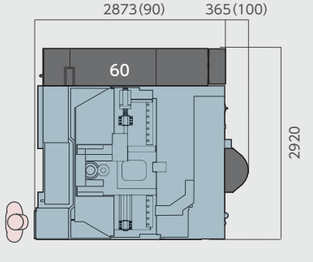


YBM950V Ver.Ⅳ

Standard 30 tools/option 40 tools

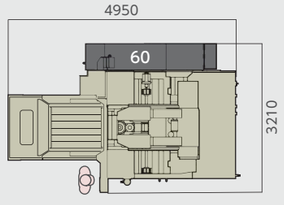


Option
90 tools (30 tools+60 tools)
100 tools (40 tools+60 tools)

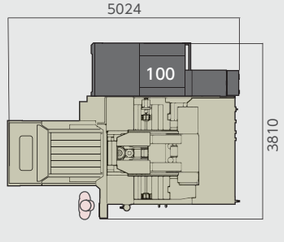


YBM9150V Ver.Ⅱ

Standard 60 tools



Option
100 tools



Automatic pallet changer (APC)

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

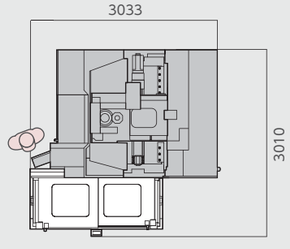
The APC adopts YASDA's proprietary pallet chucking mechanism, and offers high repeatability and chucking rigidity which are most important in the performance of high precision machining. The preload stand (PLS) can be easily set up, and can automatically machine several kinds of different workpieces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

OUTLINE

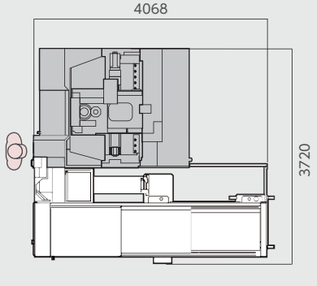
unit:mm

YBM640V Ver.Ⅳ

PC

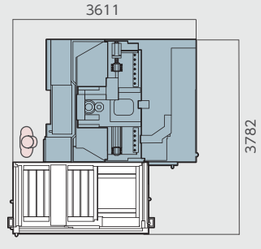


5PLS

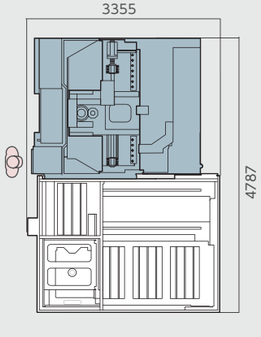


YBM950V Ver.Ⅳ

PC

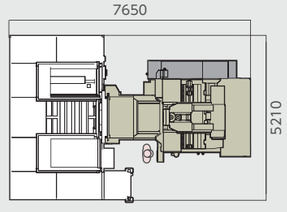


4PLS



YBM9150V Ver.Ⅱ

PC



Additional 1 axis supports precise 4-axis machining Option

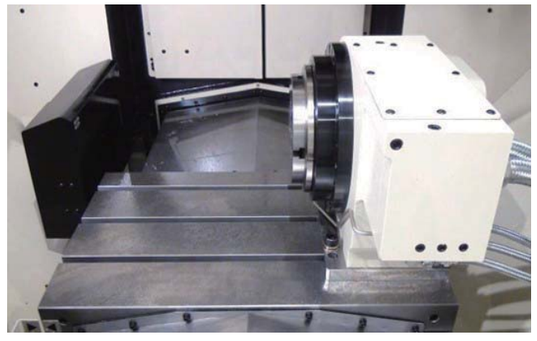
YASDA's 1 axis rotary table realizes highly accurate 4-axis machining.

RS20

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

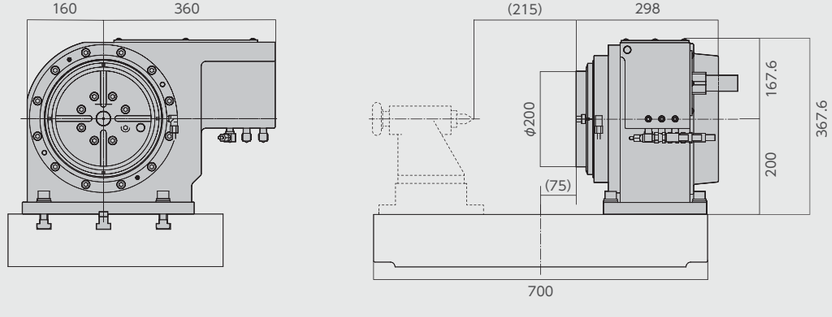


RS20 specifications

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)
Max. rotation speed (rapid traverse)	150min^{-1}
Allowable workpiece loading capacity	40kg
Least input increment	0.0001°
Height up to table center	200mm

OUTLINE YBM 640V Ver.Ⅳ

unit:mm



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
microbo
ZK simply genius



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.

V-series SPECIFICATIONS

YASDA

1. Specifications of base machine		640V Ver.Ⅳ	950V Ver.Ⅳ	9150V Ver.Ⅱ
1) Travel	X-axis travel (Cross movement of column)	600mm	900mm	1,500mm
	Y-axis travel (Longitudinal movement of table)	400mm	500mm	900mm
	Z-axis travel (Vertical movement of spindle head)	350mm	350mm	450mm
	Distance from table surface to spindle nose face	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			7/24 taper No.40
	Spindle end surface			BIG plus spindle
3) Table	Table working surface	700mm×450mm	1,000mm×500mm	1,500mm×900mm
	Table 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 traverse rate			20,000mm/min
	Cutting feed rate			1～5,000mm/min
	Least input increment			0.0001mm
5) Automatic tool changer	Tool shank type	30	30	MAS BT40
	Pull-stud type	ϕ100mm/250mm/7kg	ϕ100mm/250mm/7kg	JIS B6339-40P
	Tool storage capacity	Approx.8,000kg	Approx.11,000kg	60
	Maximum tool diameter / length / mass	39kVA	39kVA	ϕ100mm/300mm/7kg
6) Mass of machine				Approx.16,000kg
7) Electric power capacity				41kVA
8) NC unit				FANUC 31i-B5

2. Standard equipment	640V Ver.Ⅳ	950V Ver.Ⅳ	9150V Ver.Ⅱ
1) Optical scale feed back			X-,Y-,Z-axes 0.0001mm command compliant
2) Cutting oil unit	Manual door with top cover, One LED light at one position	Manual door with top cover, One LED light at one position	Manual door with top cover, Two LED light at one position
3) Thermal displacement compensation for spindle			Standard data
4) Screw conveyor	Twin screw	Twin screw	Twin screw
5) Automatic power breaker			
6) Thermal distortion stabilizing system			Standard type
7) Standard Machine color			RAL 1013 (Oyster white)
8) OpeNe Version2.0			

3. CNC standard options	
1) Least input / travel increment	0.0001mm
2) Display	15"LCD touch panel with iHMI
3) Program storage length	1280 m (512 KB)
4) Custom macro	Common variable : 600
5) Number of registerable programs	1,000
6) Automatic corner override	
7) Tool offset pairs	64 pairs
8) Tool offset memory	C memory
9) Extended part program editing	
10) Background editing	
11) Memory card/USB memory interface	Data input/output

4.Optional equipment		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	AC5.5kW/11kW (Continuous/5min.)	AC5.5kW/11kW (Continuous/5min.)	AC18.5kW/22kW (Continuous/30min.)
	Spindle taper hole	7/24 taper No.30	7/24 taper No.30	7/24 taper No.40
3) Signal tower (Multilayer signal lamp)				Red, yellow, green (Flashing)
4) Cutting fluid temperature control unit				
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 equipment			640V Ver.Ⅳ	950V Ver.Ⅳ	9150V Ver.Ⅱ
8) Micro fog coolant unit					
9) Oil skimmer					
10) Mist collector					
11) Automatic tool length compensation and tool breakage sensor					Manufactured by BLUM/NT type
12) Automatic tool length compensation and tool breakage sensor					Manufactured by BIG Daishowa / Dyna Vision Pro
13) Automatic tool length compensation and tool breakage sensor					Manufactured by BIG Daishowa / Dyna Line
14) Automatic measuring system					
15) High-speed machining function (YASDA HAS-4 system)					Maximum feed rate12,000mm/min
16) Thermal distortion stabilized system					With weekly timer
17) Weekly timer					
18) Thermal displacement compensation for spindle					Individual data
19) Automatic pallet changer(APC)	Unit mass		1,500kg	2,500kg	5,000kg
	Safety guard for pallet changer				
20) Preload stand (PLS)	Number of pallet stands		5 stands	4 stands	—
	Unit mass		2,500kg	3,000kg	—
	Automatic program search				—
	Safety guard for PLS				—
21) 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
			300kg	400kg	2,500kg
22) Pallet chucking system	Loading capacity on pallet		40,60,90,100	40,60,90,100	100
23) Automatic tool changer	Tool storage capacity		ϕ100mm/250mm/7kg	ϕ100mm/250mm/7kg	ϕ100mm/300mm/7kg
	Tool diameter/length/mass				
24) AWC door					Compatible with System 3R and EROWA
25) Robot interface					
26) Washing gun					
27) External lift-up chip conveyor					
28) Cutting liquid unit level switch					
29) Automatic fire-exthiguishing equipment interface					

5.CNC Options	
1) Part program storage	Total: 1MB, 2MB, 4MB, 8MB
2) Extensional 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 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, 999 sets
11) Addition of workpiece coordinate	48sets, 300sets
12) Tool management	
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) Work setting error compensation	G54,4Pn
18) Ethernet function	FOCAS2/Ethernet
19) Data server function	Fast data server, Capacity: 1GB, 2GB, 4GB, 16GB