

MP-2620(U)

Shibaura Machine

MP-2620(U)

Double Column Machining Center
Bridge type Multi-Purpose Machine



Shibaura Machine

View the Future with You

ISO 9001



SHIBAURA MACHINE CO., LTD.

TOKYO MAIN BRANCH
2-2, Uchisaiwaicho 2-Chome, Chiyoda-ku, Tokyo 100-8503, Japan
TEL:+81-3-3509-0271 FAX:+81-3-3509-0335

SHIBAURA MACHINE CO., AMERICA
Chicago Head Office
755 Greenleaf Avenue, Elk Grove Village, IL 60007, U.S.A.
TEL:847-709-7199 FAX:847-593-9741

Canada Branch
6 Shields Court, Suite 101, Markham, Ontario L3R 4S1, CANADA
TEL:905-479-9111 FAX:905-479-8339

SHIBAURA MACHINE UK LTD.
66 Burners Lane, Kiln Farm, Milton Keynes MK11 3HD
UNITED KINGDOM
TEL:+44-(0)1908-562327 FAX:+44-(0)1908-562348

SHIBAURA MACHINE SINGAPORE PTE. LTD.
Head Office
123 Pioneer Road, Singapore 639596, SINGAPORE
TEL:68611455 FAX:68612023

TOSHIBA MACHINE [THAILAND] CO., LTD.
127/28 Panjathanee Tower, 23rd Floor, Nonthree Road, Khwaeng Chong
Nonthree, Khet Yannawa, Bangkok 10120, THAILAND
TEL:02-681-0158 FAX:02-681-0162

TOSHIBA MACHINE [VIETNAM] CO., LTD.
2nd, VIT Tower, No.519, Kim Ma Street,
Ba Dinh District, Hanoi, VIETNAM
TEL:024-2220-8700,8701 FAX:024-2220-8702

TOSHIBA MACHINE (CHENNAI) PRIVATE LIMITED
No. 65 (P.O. Box No. 5), Chennai-Bangalore Highway, Chembarambakkam,
Poonamallee Taluk, Thiruvallur, Chennai-600123, Tamil Nadu, INDIA
TEL:044-2681-2000 FAX:044-2681-0303

SHIBAURA MACHINE TAIWAN CO., LTD.
No.62, Lane 188, Jui-Kuang Road, Nei-Hu District, Taipei, TAIWAN
TEL:02-2659-6558 FAX:02-2659-6381

SHANGHAI TOSHIBA MACHINE CO., LTD.
Head Office
4788, Jin Du Road, Xinzhuang Industry Zone, Shanghai, 201108
PEOPLE'S REPUBLIC OF CHINA
TEL:021-5442-0606 FAX:021-5866-2450

* We reserve the right to change any of specifications in this catalog without notice in order to effect improvements.

URL : <https://www.shibaura-machine.co.jp>

SM20014-1100-SZ
Printed in Japan

Catalog MP26155-CED-04



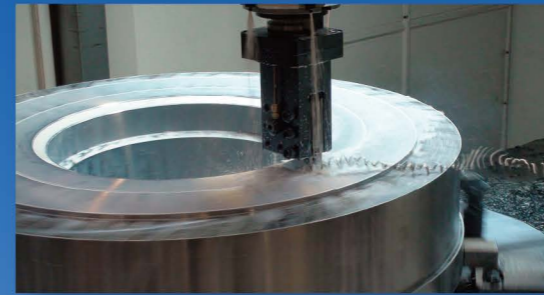
SHIBAURA MACHINE'S ADVANCED TECHNOLOGIE have been focused on our bridge type multi-purpose machine.

MP-2620(U)

- MP-2620(U) capable of handling multiple processed. Machining center, vertical turning center, and as a 5 axis machine when selecting the optional spindle head. The overall design of this machine is an integral feature to also process an extensive range of machine parts. MP-2620(U) contributes to minimize lead time in production by integrating several processes in one machine.
- All linear axis X, Y and Z are designed with twin drive mechanism in order to achieve high rigidity and high accuracy. This attribute allows swift machine motion even at 40m/min in rapid and 20m/min in cutting feed mode.
- MP-2620(U) has a contouring C-axis and NC CONTROLLED TURNING TABLE. Additionally AN OPTIONAL 4-axis head for 5-axis machining.
- MP-2620(U) "TOSNUC PX100" our state-of-the-art controller which is an integrated system of our TOSNUC999 and PC-HMI developed by Shibauro Machine.



MP-2620(U) Is a Multi-purpose machine designed to execute various function in diverse machining application and processes, combined with several attachments as if it were a machining center and a turning center.



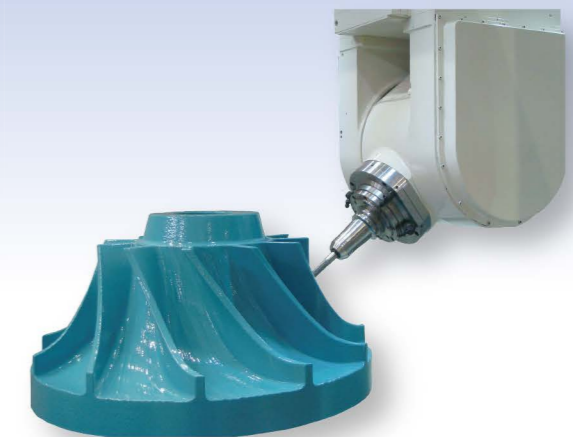
Turning operation



Milling operation



inclined drilling with optional 4-axis head



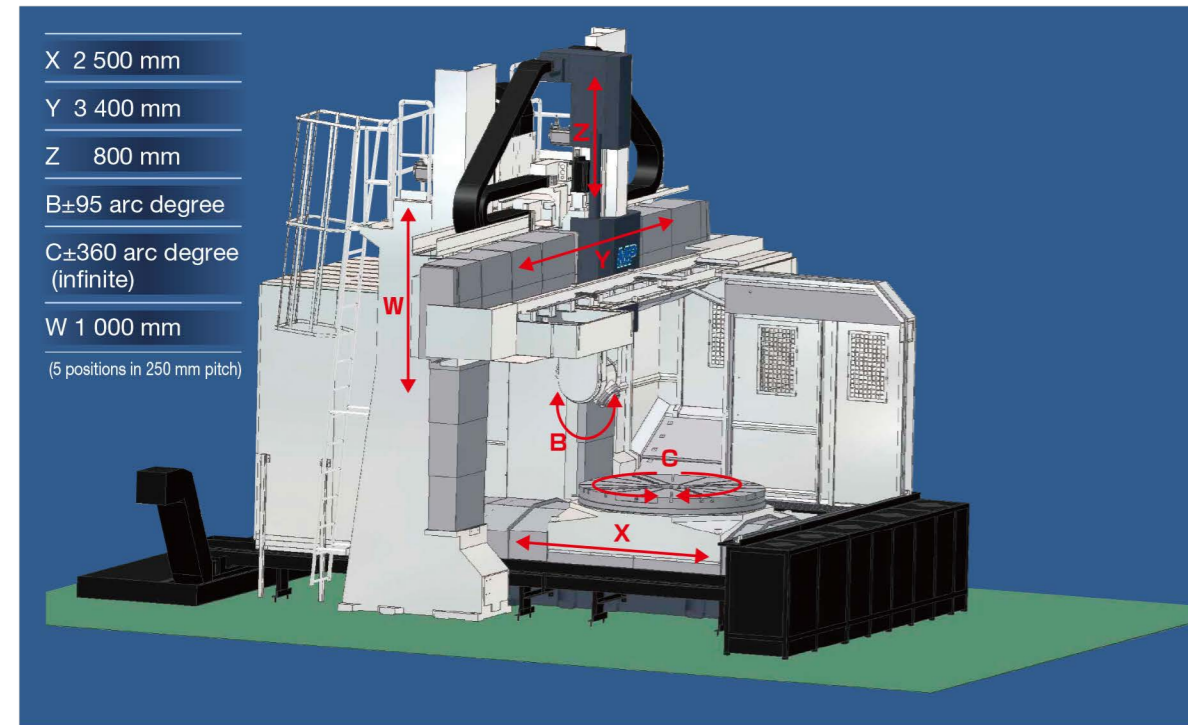
Simultaneous 5 axes machining

Axis configuration

The standard machine has 4 axes which consist of three (3) linear axes of X, Y, and Z, and one (1) rotary axis C.

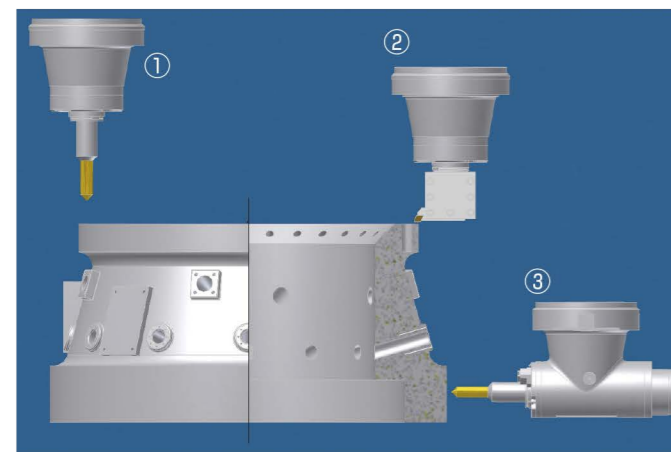
A 4-axis head in an (optional accessory) for 5-axis machining.

The W axis is a crossrail that can be located at 5 positions is 250mm increments.

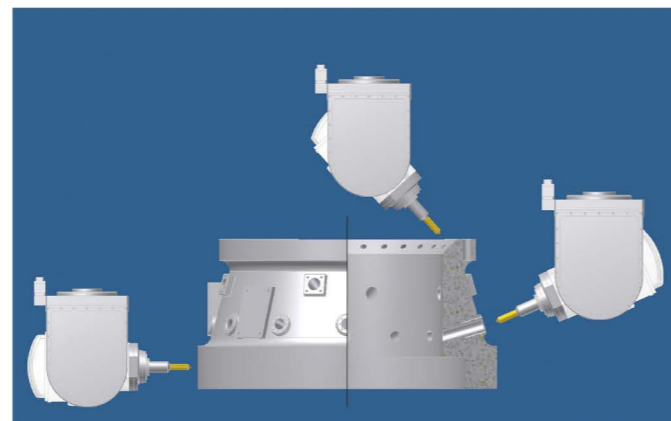


Productivity

Several kinds of attachments make the machine a multi-purpose machine.



4-axis head is shown for machining on any inclined surface.



The Snout 240 can be used for boring and turning operation as shown in figure 1, and 2.

The angle head can be utilized for machining the side of a workpiece as shown in figure 3.

Accessibility



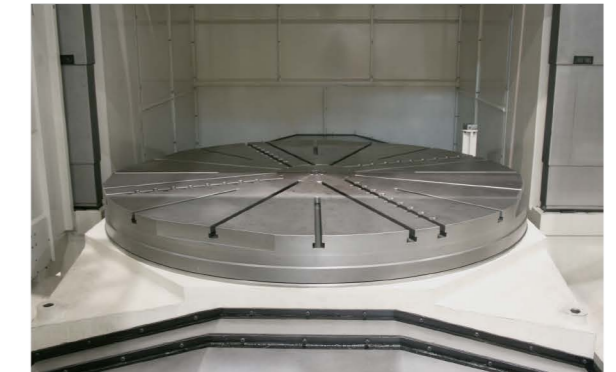
Chip cover with ceiling

The chip cover with ceiling enclosure is standard accessory, and the L-shape door with ceiling compliment an ergonomic design, enabling easy access to the area around the table.

Excellent chip discharge around a wide enclosure.

Wide space and easy chip discharge around the table

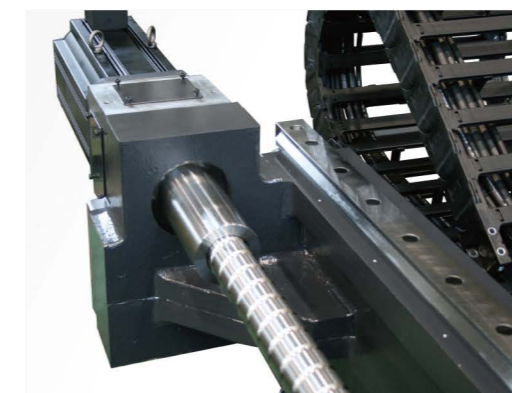
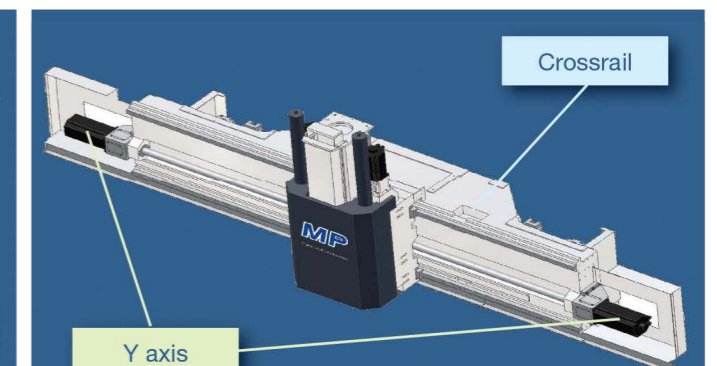
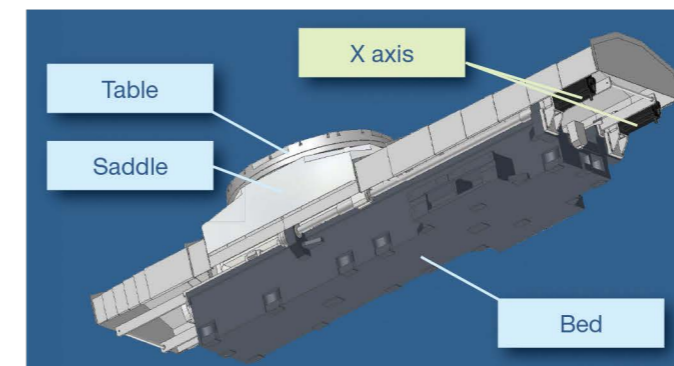
A round rigid table is utilized turning and milling operations for both turning and milling operations.



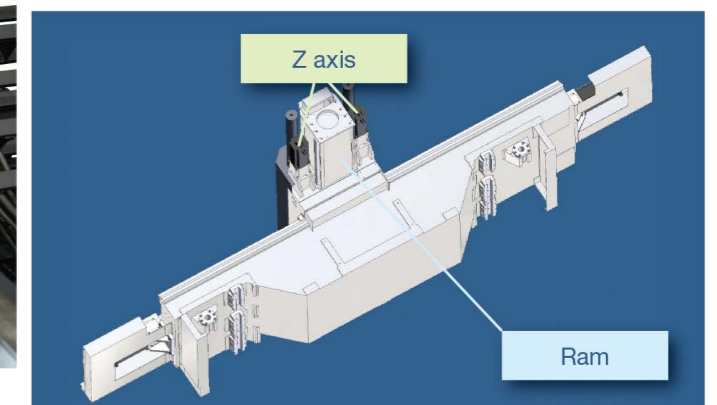
Swift motion, high rigidity, high accuracy

The twin drive mechanisms on all linear axes assure swift motion, high rigidity, and higher accuracy on the machine.

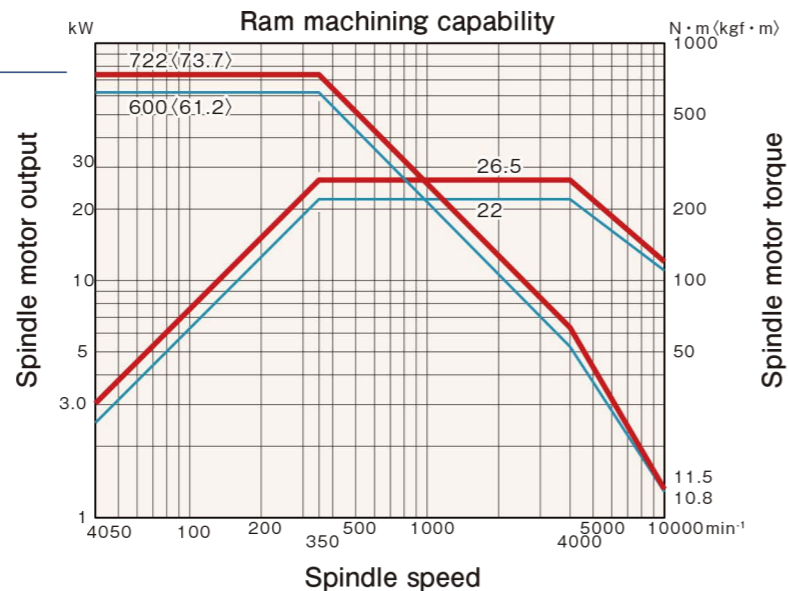
Solid casted brackets support ball screws on all linear axes to assure high positioning accuracy.



Solid casted brackets



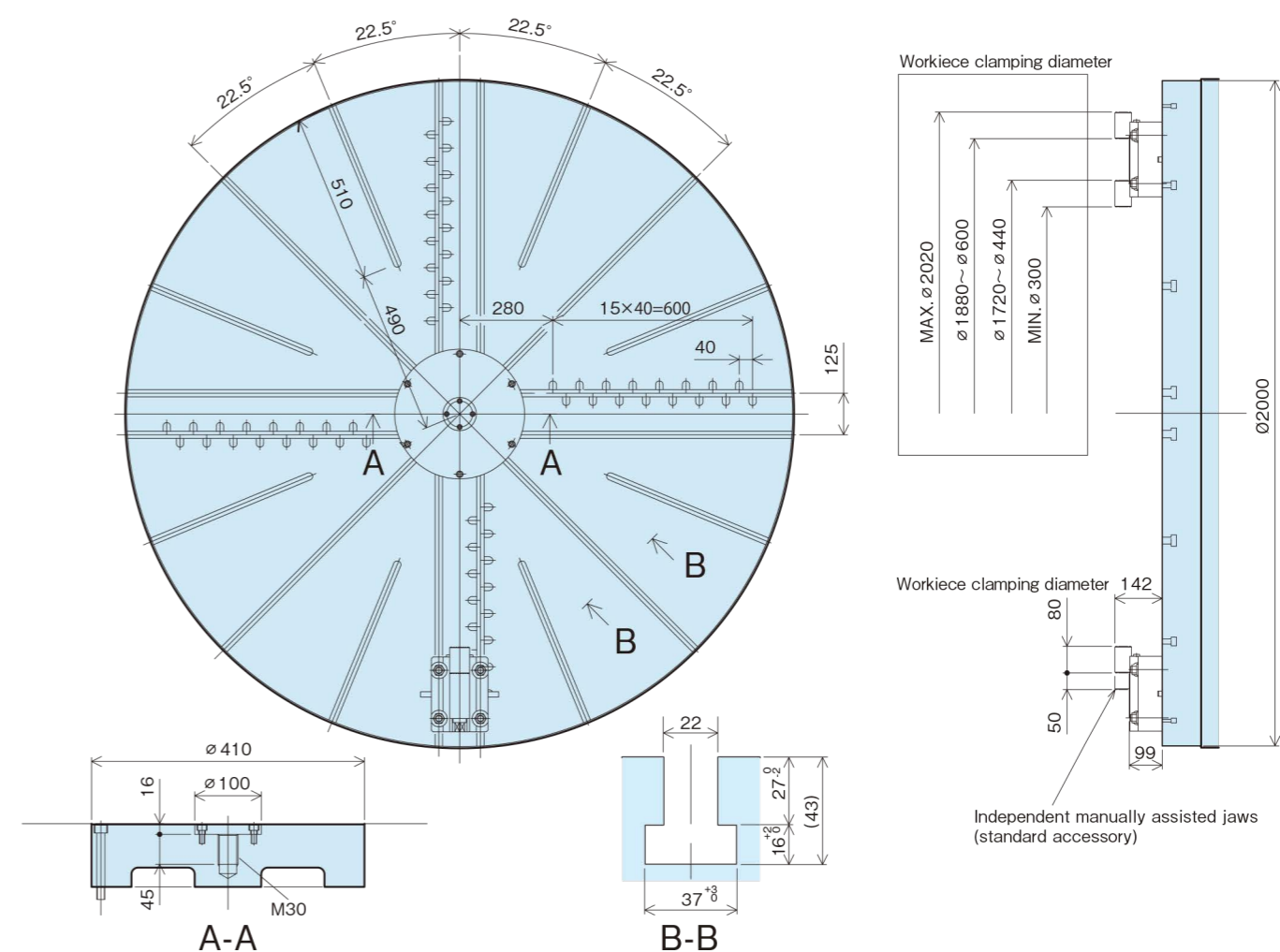
Milling capability



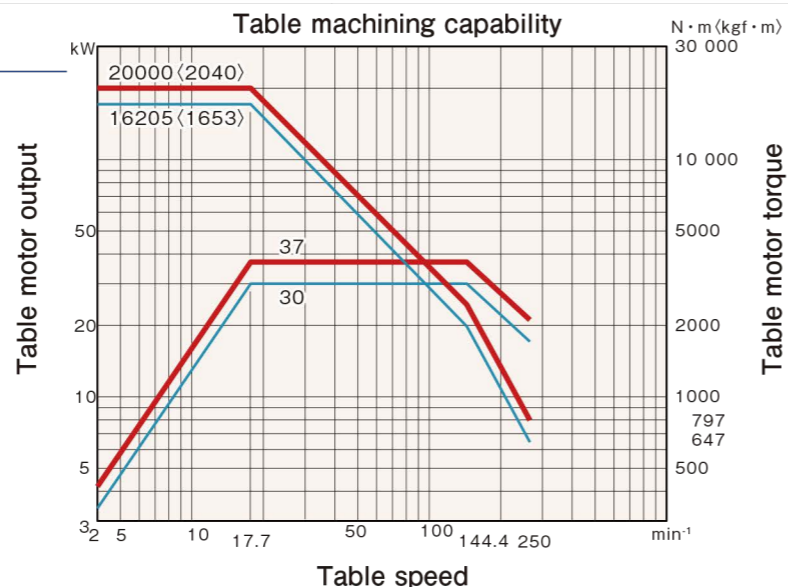
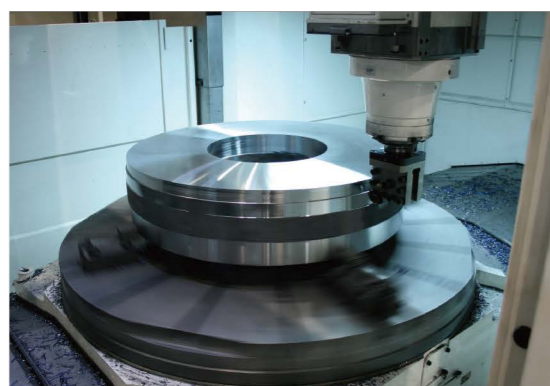
Material: S55C (machined with the "Snout 240")

	Tool diameter mm	Surface speed m/mm	Spindle speed min ⁻¹	Feedrate mm/min	Machining width mm	Cutting depth mm	Machined volume cm ³ /min	Ram extension mm
Face milling	φ160	175	350	910	120	7	764	400
End milling	φ63	120	600	440	30	50	660	400
Drilling	φ69.5	22	100	50	-	-	-	350

Table configuration



Turning capability

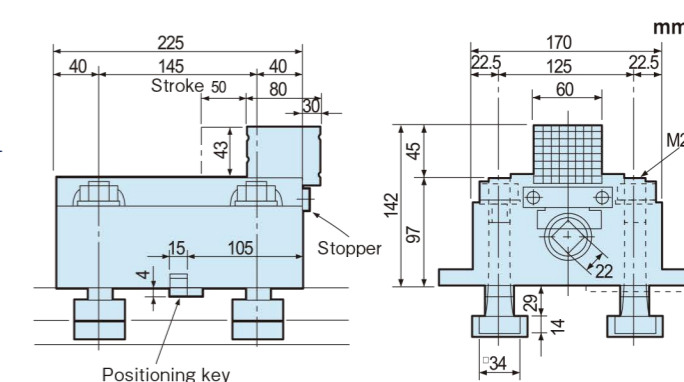


Material: SS400 (machined with the "Snout 240")

	Table speed min ⁻¹	Federate mm/rev	Cutting depth mm	Ram extension mm	Machining diameter mm	Load ratio %
Machining outside	25	1	7.5	800	900	50
Machining top surface	25	1	7.5	650	-	37

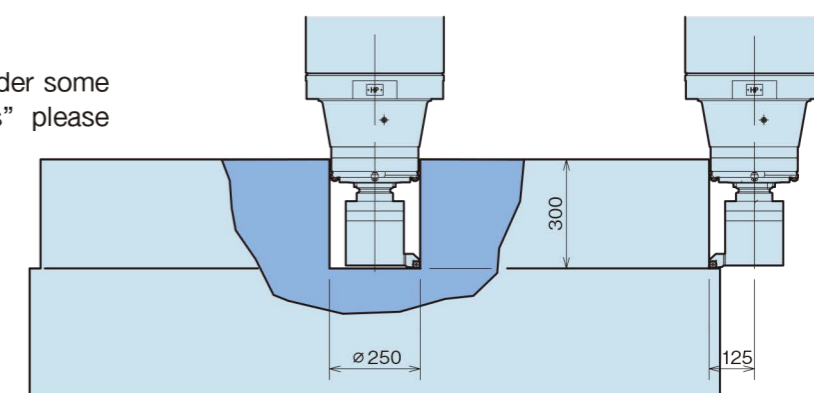
Manually assisted independent jaws (4 sets)

- Maximum clamping force : 4 tons, (18kgf-m clamping torque)
- Mass of a unit ; 28 kg



Cautions on turning operation

Turning depth on a square type tool holder some restrictions "on a case-by case basis" please consult us for further detail.



Machine Specifications

Machine Specifications		unit	MP-2620 (U)	
Travel	X-axis travel(table longitudinal direction)	mm[in]	2 500 [98.4]	
	Y-axis travel(spindle head crosswise direction)	mm[in]	3 400 [133.8]	
	Z-axis travel(ram vertical direction)	mm[in]	800 [31.4]	
	W-axis travel(crossrail elevation)	mm[in]	1 000 [39.3] (9.8×5steps)	
	C-axis travel(table rotation)	deg	±360 (infinite)	
	Height(distance from table top face to gage plane of Snout 240)	mm[in]	1 750 [70.2]	
Table	Distance between column	mm[in]	2 600 [102.3]	
	Table diameter	mm[in]	2 000 [78.7]	
	Maximum mass on table	kg[lbs]	10 000 [22 000]	
	Table speed	min ⁻¹	2 ~ 250	
	Number of speed range		2 ranges	
	Maximum torque	N.m[Ft-lbs]	20 000 [14 802]	
Spindle	Table drive motor	kw[hp]	AC37/30 [AC50/40] (30 min continuous rating)	
	Spindle speed	min ⁻¹	40 ~ 10 000	
	Number of speed range		2 ranges	
	Taper on the spindle		7/24 taper No.50 (BIG PLUS)	
	Maximum torque	N.m[Ft-lbs]	722.7 [534.8]	
	Bore of main bearing	mm[in]	100 [3.9]	
Feedrate	Guide for ram		Rolling guide	
	Ram sectional dimensions	mm[in]	380×380 [14.9×14.9]	
	Spindle drive motor	kw[hp]	AC26.5/22 [AC35/30] (30 min continuous rating)	
	Rapid travers rate	X/Y	mm/min[ipm]	40 000 [1 574] (Lard on table must be less than 3000 kg)
		Z	mm/min[ipm]	40 000 [1 574] (standard snout)
		C	deg/min	30 000 [1 181] (except standard snout)
Feedrate for machining	X/Y/Z	mm/min[ipm]	1 - 20 000 [0.04 - 787]	
	C	deg/min	1 - 1 080(3 min ⁻¹)	
Tool	Tool shank		MAS BT50	
	Pull stud		MAS P50T-1(45°)	
	Tool storage capacity		60 tools	
Machine size	Machine height	mm[in]	6 600 [260]	
	Floor space	mm[in]	7 515×8 705 [335×394]	
	Mass of machine	kg[lbs]	55 000 [121 000]	
Accuracy	Positioning accuracy	X/Y/Z	mm[in]	±0.007/1 000 [±0.0002/39.4]
		C	sec	±5
	Repeatability	X/Y/Z	mm[in]	±0.003 [±0.00012]
C		sec	±3	

Standard accessories

- Snout 240
- Automatic attachment indexing device (AAI)
 - 4 positions every 90 degrees
- Automatic tool clamp/unclamp device
- Automatic tool changer (ATC) Tool storage capacity : 60 tools.
- Spindle shape for BIG PLUS type shank
- Scale feedback on X, Y, Z, and C axis (hybrid feedback)
- Hydraulic unit
- Spindle head cooling unit
- Telescopic steel cover for bed
- Telescopic steel cover for crossrail
- Telescopic steel cover for column
- Installation parts (leveling block type)
- Special maintenance tool set
- Independent manually-operated jaws (4 units)
- Coolant through spindle
 - Available on "snout 240", and refer to other attachment in detail.
- Operation panel on stand
- Chip cover with ceiling
 - For safety, door is interlocked to hold machine movement when they are not closed.
- Machine control panel installed on shop floor
 - Two electrical sockets with capacity of 5 ampere in 100 volt and one socket for RS-232-C port are provided on it.

Optional accessories

- ☆1. Automatic power shut down function
Primary power to the machine will be shut-down automatically after power to CNC has been OFF, when M02 or M30 in a program has been executed while the switch "AUTO POWER OFF" had set at "ON".
- ☆2. Work light
Water proof type 40W fluorescent lamp is mounted under crossrail.
- ☆3. Operator call lamp
3-color lamp is mounted on top of right column.
Green lamp show the machine is running under automatic mode.
Yellow lamp show one of M00, M01, M02, N30 and M52 is executed to wait for operator's assistance.
Red lamp show the machine is stopping in some alarm.
4. Automatic tool changer (ATC)
Tool storage capacity 90, 120 tools
Maximum milling tool size
When same size tool are in adjacent pots. φ125 mm
Adjacent pots are empty φ240 mm
Maximum turning tool size
Adjacent pots must be empty □160 mm
Maximum length of tool 400 mm
Maximum mass of tool 30 kg
Maximum moment around gauge line 53 N-m (.54 kgf-m)
Tool selection Pot address random short way
• Turning tool is recommended to be stored in pot with numbers of multiple of 5. An interlock is provided in the controller based on a kind of tool for turning or milling by judging these tool numbers.
• A dummy tool for protecting spindle taper should be stored in No. 1 pot.
5. Tool breakage detection device for small drill or tap
The machine will check length of the tool twice, before loading it on the spindle and after removed it from the spindle, to find tool breakage by comparing these two data, when T80xxx is programmed for tool number.
6. Pull stud
Type MAS P50T-1 (30°)
7. Automatic pallet changer (APC)
• Maximum swing of workpiece 2 600 mm
• Maximum swing of workpiece on next pallet 2 400 mm
• Distance between door gates 2 600 mm
• Number of pallet 2 pallets
• Maximum mass on a pallet 7 000 kg
• Rotational speed at set-up station 1.0 min⁻¹
8. External program number search function
The new program number (8 digits) will be searched automatically to start machining, when new pallet has been loaded on the machine.
9. Automatic attachment changer (AAC)
Attachment will be mounted on the ram automatically through program.
Number of attachment to be stored 2 units
10. Attachment indexing at every 5 degree or every 1 degree (AAI)
There are two ways for program as below.
• Automatic indexing at every 5 degree or every 1 degree M37C
G37C (G14/G10)
11. Several kinds of attachment and its support base
Please refer to page 16 and 17 in this catalogue in detail.
12. 4-axis head with AATC feature
• Spindle power 64/53.4Kw
• Spindle torque 236 N·m[174.6Ft-lbs]
• Spindle speed 150~12 000 min⁻¹
• Spindle swivel range ±95 degree
• Rapid swiveling B: 10 800 deg/min(30min⁻¹)
• Swiveling federate B: 10 800 deg/min(30min⁻¹)
• Indexing accuracy B: ±5 sec
• Repeatability B: ±3 sec
• Feedback scale Rotary scale
• Simultaneous 5 axes control Available
NOTE Primary power capacity must be 170 KVA.
AAI to the ram is not available for this unit, because of wiring to it.
13. Power chip conveyor (type B)
Two sets of hinged type conveyor are placed in longitudinal along both side of bed.
14. Coolant unit B
Foundation floor for the unit should be 300 mm below the machine foundation floor.
Additional short hinged type conveyor is integrated in the unit.
• Coolant tank capacity 800 Liter
• Effective volume of coolant on the unit 440 Liter
• Delivery 10 Litter/min
• Coolant pressure at pump delivery port 1.0 MPa
Coolant Water base to prevent accident of fire
Coolant will be delivered from nozzles mounted on the attachment when M08 is programmed.
15. Chip bucket
This is a portable type bucket to be utilized together with above item 15.
The bucket could be swing for discharging chips from it easily.
16. Air blow device
Air can be exhausted from the same nozzle and/or spindle center as coolant.
Maximum air volume 800 NL/min
Air compressor 11 kW
Air volume depends on compressor capacity.
17. Air blow through spindle center function
This is available on standard snout.
Please refer to other attachment in detail.
18. Mist coolant unit
Coolant will be exhausted in mist through the same nozzle as coolant when programmed M07.
19. Automatic measuring device
ON/OFF of the device will be controlled by M codes.
This device consists of radio touch probe manufactured by Renishaw and one set of standard software (including software for checking bore and step) generated by Shibaura Machine. Printer is not included in the system.
Radio frequency to be used on the radio probe is 2.4 GHz.
Skip function in CNC optional specification must be selected when choosing this device.
NOTE : Same type of radio touch probe is used on a existing machine near-by the machine. Please let us know, because a radio frequency must be adjusted prior to machine shipment.
20. Automatic tool length measuring device
This device consists of measuring instrument and software.
A reference tool is not included, but is able to be supplied from Shibaura Machine when ordered.
Skip function in CNC optional specification must be selected when choosing this device.
21. Ball screw cooling through core
Ball screws to be applied on feed system on linear axes of X, Y, and Z, are cooled through center core for better positioning accuracy.
22. Free arm pendant
The pole of arm pendant will stand on shop floor.
Operator stand will be deleted when this is selected.
23. Pre-heat timer
There are two type of pre-heat timer as follow.
Type A: Power to the machine including CNC and hydraulic unit will be turned ON at pre-determined time by a timer
Type B: In addition to function in type A, special machine will start automatically with the special warming-up program
24. Unit to different power specification
Independent transformer will be supplied.
Please inform us your power specification when ordering.
25. Heat expansion compensation on Z axis
Special function in CNC optional specification must be selected when choosing this.
This is exclusively developed for "Die manufacturer" by Shibaura Machine to minimize expansion on the ram in order to achieve fine surface in contouring.
26. High pressure coolant
Pressure at pump delivery port 2.0 MPa
27. Full CNC control on W axis
Special hydraulic servo balance system is applied on the W axis.
• Rapid 3 000mm/min
• Feedrate 1~3 000mm/min
• W axis is parallel axis of Z axis and could be combined with another axis except Z axis.
• Tool could change automatically through ATC at higher position than 250 mm.
• Hydraulic pump motor will be 15 kW and size of the unit will be larger than standard case, because tank capacity will be 300 Liter in stead of 160 Liter on standard unit.
28. Feedback scale on W axis
29. Extra step positions on W axis
Number of steps are 11 position and pitch is 100 mm.
30. Air dryer
31. Air compressor
A screw type compressor will be supplied with 11 kW motor.
Independent power line to the unit must be prepared by the customer.
32. Customer's machine color
Sample piece painted with the custom color must be supplied from the customer in addition to Munsell specification of the color.
Painting color on such unit as pendant, company mark, purchased unit are always standard color of manufacturer.
33. Exchange of axis name between X and Y
This exchange can not be applied on the case when 4-axis head is selected.
34. Coolant through tool block
This is available only for milling attachment.
Turning tool holder will interfere with this block and this block is not furnished when a turning holder is selected.
Coolant will be delivered through this block when tool with coolant through tool feature is mounted on the spindle.
35. Tool holders
Refer to page 17 in detail.
(1) Square tool holder □32W160L230 S-3M910
(2) Boring tool holder BFP □25D110L250 S-9K746 #1
(3) Boring tool holder BFP □25D110L300 S-9K746 #2
(4) Boring tool holder BFP □25D110L350 S-9K746 #3
(5) Boring tool holder BFP □20D80L200 S-9K747 #1
(6) Boring tool holder BFP □20D80L250 S-9K747 #2
(7) Boring tool holder BFP □20D80L300 S-9K747 #3
(8) Boring tool holder BFP □20D80L350 S-9K747 #4
(9) Boring tool holder BA □20D110L250 S-9K748 #1
(10) Boring tool holder BA □20D110L300 S-9K748 #2
(11) Boring tool holder BA □20D110L350 S-9K748 #3
(12) Boring tool holder BA □20D80L200 S-9K749 #1
(13) Boring tool holder BA □20D80L250 S-9K749 #2
(14) Boring tool holder BA □20D80L300 S-9K749 #3
(15) Side lock holder φ25D65L150 S-9K750 #1
(16) Side lock holder φ32D72L180 S-9K750 #2
(17) Side lock holder φ40D80L200 S-9K750 #3
(18) Side lock holder φ50D90L250 S-9K750 #4
(19) Side lock holder φ63D98L200 S-9K751 #1
(20) Side lock holder φ68D110L200 S-9K751 #2
Explanation on code of holder: □20D110L350
□20 mm Shank size D110 mm Bar diameter L350 mm Holder length from gauge line

TOSNUC PX100 STATE OF THE ART CNC CONTROLLER DEVELOPED TO MAXIMIZE MACHINE PERFORMANCE & PROFITS.

TOSNUC PX100

TOSNUC PX100, A personal computer architecture. Integrated into our TOSNUC controller developed specifically to enhance our CNC controller with higher performance functions and even more versatility. Our goal to create more innovative features that support easier operation thus contributing to an increase in productivity and machine performance.

Visible wide 15 inch TFT

User media (USB memory, Compact Flash (CF) card)



Dials for feed and spindle is simple and easy to operate.

The manual pulse generator is considered safety and operativeness.

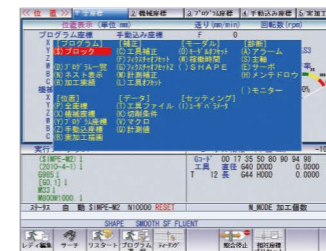
Versatility in operation based on our vast experience

Based on our extensive experience integration between mechanical and electronic technology. Our new CNC controller was developed with an emphasis on easy operation, easy to understand and easy to remember. This perfect combination is the Key to achieving higher machining accuracy in high speed machining.

Pop-up menu

By pressing a soft key on the selected screen a menu will appear showing the desired function on a sub display window.

Having a pop up display menu type system avoids complicated hierarchy in software and shortening the scan time to process a desired function.



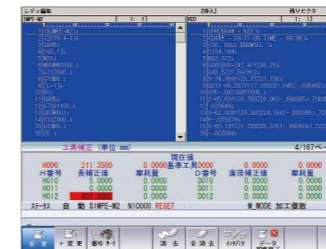
File editing screen

Multi-task and multi-window is a feature that enables you to open a window file from any current screen to perform program input/output deleting or copy a program to execute a calculator screen clipboard. Program list and memory are connected to a user media and displayed on the screen allowing the program to be checked in a preview window within the same screen during input or output of programs from a user media.



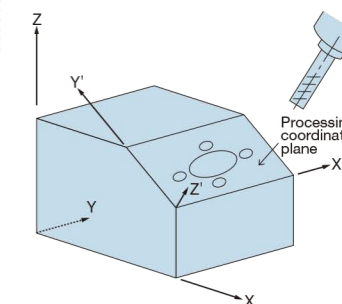
Multi screen background edit

The screen can be divided into three sections to display two program screens and the third shown MODAL OFFSET DATA compensation information which is required upon machining. These three screens run independently during automatic operation and during editing. A new program can be generated and created utilizing a clipboard feature and or background split screen edit two programs simultaneously as compared to a personal computer.

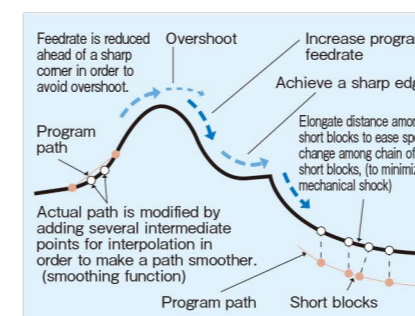


Program support functions

A general program running on G17 plane when programmed on X-Y plane and machining a depth on inclined surface as shown does not require a program modification. This very important feature convenient and executable with G command and canned cycle simplify machining of an inclined surface without effort.

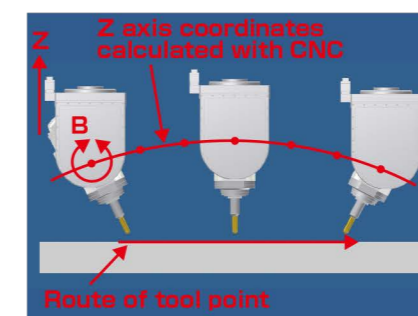


Advanced functions for high speed machining and higher machining accuracy



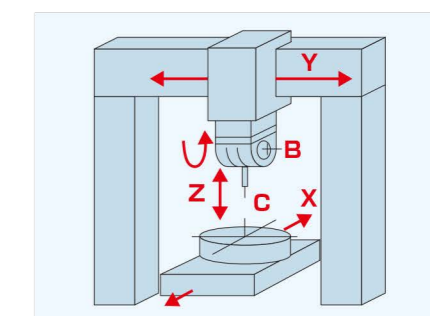
Preview control

Generally a profile that is being machined will require a true shape. Shape error decreases as servo gain increases. However a high servo gain causes overshoot and increases machine vibration causes from large. Acceleration to the mechanical components or system which in turn causes a bad surface finish during machining. Preview or SHAPE CONTROL is based on the optimum control theory developed specifically to prevent such an outcome. This important development prevents such an effect on contoured surfaces and minimizes shape error without the need for a high gain servo system.



Tool contact point control

Program path must be the path of tool position changes during rotary axis motion. Actual compensated command of each axis is calculated out from tool and machine data and program path. This important feature is key in preventing tool path error due to change of tool position on rotary axis.



Tool nose position compensation

This will compensate several errors and offset on mechanical construction. In the case of MP-2620(U), there could be errors in followings.

- Inclination of C axis center line to X axis
- Inclination of B axis center line to Y axis
- Inclination of B axis center line to X axis
- Inclination of B axis center line to Z axis
- Offset between B axis center and spindle center in X axis direction

CNC specifications TOSNUC PX100



Basic and pack specifications

Items with mark "☆" are pack specifications.

A. Controlled axes

☆Number of controlled axes	5 axes : (X, Y, Z, W, and C) 6 axes : when optional B axis is selected.
Number of simultaneously controlled axes	Positioning (G00) and linear interpolation (G01) Simultaneously controlled 4 axes X, Y, Z, C Simultaneously controlled 5 axes X, Y, Z, C, B when B axis head is furnished.
Circular interpolation (G02 and G03)	X-Y, Y-Z (W), Z (W)-X Simultaneously controlled 2 axes

☆Synchronous feed control

B. Input command

Programming resolution	Linear axis 0.001 mm Rotating axis 0.0001 degree
Maximum programmable dimension	Linear axis ±99999.999 mm Rotating axis ±9999.9999 degree
Data code	Automatic recognition of ISO/EIA code JIS B6311 ISO 6983/1 EIA RS-358-B EIA RS-244-B
Data format	Variable block with decimal point, Word address format
Absolute/incremental programming	G90/G91

C. Interpolation functions

Positioning	G00
Linear interpolation	G01
Circular interpolation	G02 (CW), G03 (CCW)

D. Feed functions

Rapid traverse	refer to machine specifications
Feedrate	F5 direct programming in mm/min
Dwell	G04 and program code of "F" or "P" maximum dwell time is 999.99 seconds

Manual jog feed

Move the machine continuously in a feed or rapid selected

Rapid traverse override	in a range of 0 ~ 100 % in 10% increments
Feedrate override	in a range of 0 ~ 200 % in 10% increments
Automatic acceleration/deceleration	Linear type acc./dec. in feed, rapid and jog feed
S-shape acceleration/deceleration for rapid	
☆Threading	G33, In-feed is synchronized with spindle rotation.

☆Feed per minute/ Feed per revolution	G94/G95
☆Dwell per revolution	G05
☆Hand wheel feed (portable type)	Linear axis 0.001 mm, 0.01 mm, 0.1 mm/div. Rotating axis 0.0001 degree, 0.001 degree, 0.01 degree/div.
☆Random start angle threading	Start angle of thread can be specified for multi-start thread.

E. Program memory and editing

☆Part program storage	600 m equivalent length of punched tape or 258 kB 512 program can be registered. 100~200m will be occupied by the manufacturer.
Part program edit (in back ground)	Stored programs can be edited about various data. Program deletion, program copy, Program number change, search, jump, operation cancel, a range designation and deletion, a range designation and copy, replace, program insert, etc.
Program name	8 digit character following \$ or O. Program comment in () can be 38 characters.
Sequence number	N5
Sequence number search	Search a block bearing the specified sequence number in forward and backward and and stop at the block
Program nesting list	A list of program nesting status will be displayed on a screen
Program offset list	Following list will be displayed on a screen. Fixture offset list B code list

Program format check

Program format check	
☆Operation panel	
Customized keys	
Tool file	
Display function	
Screen clear function	
Mode selection	
S, F manual setting	
S, F automatic setting	
Spindle motor load indication	
Working time indication	

F. Operation and display

Counting lot number	
Calendar timer	
Machining record	
Register user name	
Memory operation	
MDI operation	
G. Input and output functions and devices	
RS-232-C I/F port A	A part program, offset data, etc. can be loaded and dumped through this port.
☆User media	A part program, offset data, etc. stored on USB memory and/or compact flash card can be loaded and dumped through this
H. S, T, M function	
Spindle (S) function	5 digits following word "S"
Spindle speed override	50~150% in 10 % increment
Tool (T) function	6 digits following word "T"
Miscellaneous (M) function	4 digits following word "M"
I. Tool offset	
Tool length offset	G43, G44, G49
Tool offset	G45, G46, G47, G48
Cutter compensation C	G40, G41, G42
☆Expansion of number of tool offset	
Tool length offset	899 sets including standard
Tool diameter compensation	899 sets including standard
J. Coordinate system	
Coordinate system setting	G92
☆Fixture offset	G53, G57 99 sets of data are available.
Fixture offset 2	G54, G55, G56
Return to 2 nd , 3 rd , or 4 th reference point	G21
K. Operation support function	
Control IN/OUT	
Single block	
Optional stop	
☆Optional block skip	
Dry run	
Machine lock	
Auxiliary function lock	
Z axis feed cancel	
Manual absolute ON/OFF	
Override cancel	
All clear	
Reset	
Feed hold	
Cycle stop	

Re-start	
Sequence number collation and stop	
Data input through keyboard in manual mode	
Single block control	
Feed hold control	
Override control	
Hand wheel interruption control	
Manual interruption	
Hand wheel interruption	
Tool length/diameter measurement in manual mode	

L. Programming support function	
Plane selection	
Radius programming in circular interpolation	
Circle cutting	
Positioning on machine coordinate system	
Sub program call	
Random angle chamfering and corner R	
Canned cycle	
Automatic corner override	
☆Programmable mirror image	
☆Plane conversion	
☆Macro programming	
☆Pattern cycle	
☆Coordinate conversion	
☆Three dimensional coordinate conversion	
☆Spindle angular control	

M. Compensation function for mechanical accuracy	
Backlash compensation	
Pitch error compensation	
Uni-directional positioning	
☆Pitch error gradient compensation	
☆Straightness compensation	
N. Machine support function	
Feed interlock	
☆External deceleration	
O. Turning function	
Threading	
Retract in threading	
Continuous threading function	
Variable lead threading	
Feed per revolution/Feed per minute	

☆Part program storage	600 m equivalent length of punched tape or 258 kB 512 program can be registered. 100~200m will be occupied by the manufacturer.
Part program edit (in back ground)	Stored programs can be edited about various data. Program deletion, program copy, Program number change, search, jump, operation cancel, a range designation and deletion, a range designation and copy, replace, program insert, etc.
Program name	8 digit character following \$ or O. Program comment in () can be 38 characters.
Sequence number	N5
Sequence number search	Search a block bearing the specified sequence number in forward and backward and and stop at the block
Program nesting list	A list of program nesting status will be displayed on a screen
Program offset list	Following list will be displayed on a screen. Fixture offset list B code list

Program format check	
☆Operation panel	
Customized keys	
Tool file	
Display function	
Screen clear function	
Mode selection	
S, F manual setting	
S, F automatic setting	
Spindle motor load indication	
Working time indication	

Counting lot number	
Calendar timer	
Machining record	
Register user name	
Memory operation	
MDI operation	
G. Input and output functions and devices	
RS-232-C I/F port A	A part program, offset data, etc. can be loaded and dumped through this port.
☆User media	A part program, offset data, etc. stored on USB memory and/or compact flash card can be loaded and dumped through this
H. S, T, M function	
Spindle (S) function	5 digits following word "S"
Spindle speed override	50~150% in 10 % increment
Tool (T) function	6 digits following word "T"
Miscellaneous (M) function	4 digits following word "M"
I. Tool offset	
Tool length offset	G43, G44, G49
Tool offset	G45, G46, G47, G48
Cutter compensation C	G40, G41, G42
☆Expansion of number of tool offset	
Tool length offset	899 sets including standard
Tool diameter compensation	899 sets including standard

J. Coordinate system	
Coordinate system setting	G92
☆Fixture offset	G53, G57 99 sets of data are available.
Fixture offset 2	G54, G55, G56
Return to 2 nd , 3 rd , or 4 th reference point	G21

K. Operation support function	
Control IN/OUT	
Single block	
Optional stop	
☆Optional block skip	
Dry run	
Machine lock	
Auxiliary function lock	
Z axis feed cancel	
Manual absolute ON/OFF	
Override cancel	
All clear	
Reset	
Feed hold	
Cycle stop	

L. Programming support function	
Plane selection	
Radius programming in circular interpolation	
Circle cutting	
Positioning on machine coordinate system	
Sub program call	
Random angle chamfering and corner R	
Canned cycle	
Automatic corner override	
☆Programmable mirror image	
☆Plane conversion	
☆Macro programming	
☆Pattern cycle	
☆Coordinate conversion	
☆Three dimensional coordinate conversion	
☆Spindle angular control	

M. Compensation function for mechanical accuracy	
Backlash compensation	
Pitch error compensation	
Uni-directional positioning	
☆Pitch error gradient compensation	
☆Straightness compensation	
N. Machine support function	
Feed interlock	
☆External deceleration	
O. Turning function	
Threading	
Retract in threading	
Continuous threading function	
Variable lead threading	
Feed per revolution/Feed per minute	

Diameter programming
Direct dimension programming on drawing
Chamfering/corner R
Standard turning canned cycle
Compound turning canned cycle
Direct input of coordinate shift data
Constant surface speed control
Tool offset
Nose R compensation
Tool geometry/wear compensation
Counter input of offset data
Direct input of measured data for tool offset
Actual spindle speed indication in T code
Chamfering ON/OFF
Dynamic change of programming between radius and diameter
P. Safety and maintenance
Emergency stop
Overtravel check
Stored stroke check
Axis interference check II
Self-diagnosis
☆Axis interference check I
☆Door interlock
Q. Panel and room condition
Power specifications
Room conditions
R. Servo system
Servo motors
Feedback scale
Optional specifications
A. Controlled axes
1 Additional controlled axis B axis for optional 4-axis head automatically selected with the head
B. Input command
2 Inch/metric selection G70/G71
C. Interpolation functions
3 Helical interpolation G02/G03
4 Hypothetical axis interpolation G07 α 0/1 α is an axis address. The axis specified for α will never move in this program.
5 Cylindrical interpolation G67 for machining cylindrical cam
6 Involute interpolation G105

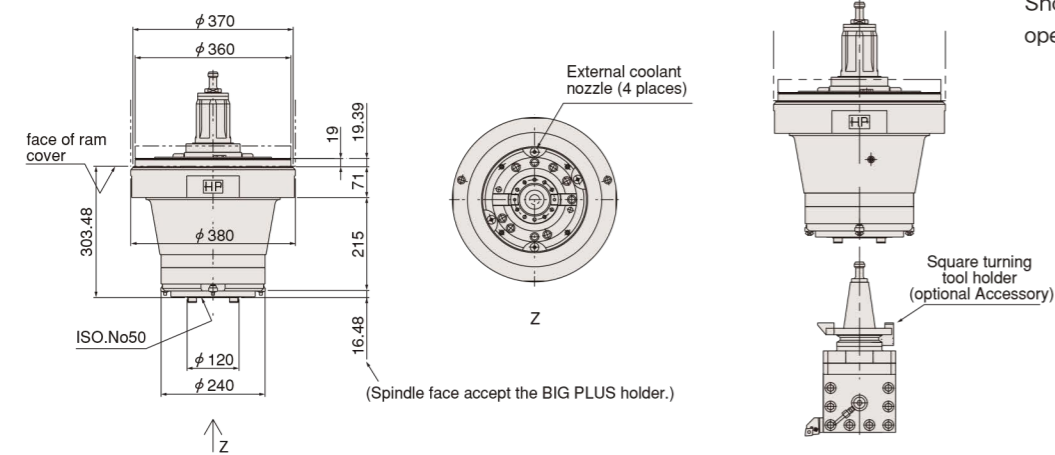
7 Archimedean interpolation G102/G103
8 Spindle normal direction control G140/G141/G142
D. Feed functions
9 Synchronous tapping G843/G844/G845 Available spindle speed is 20 ~ 750 min ⁻¹ .
10 Synchronous threading For threading on large diameter by boring tool
E. Program memory and editing
11 Storage capacity A 1 200 m, 538 kB, 1 024 programs
Storage capacity B 3 000 m, 1.25 MB, 1 024 programs
Storage capacity C 5 400 m, 2.2 MB, 1 024 programs
Storage capacity D 7 800 m, 3.15 MB, 1 536 programs
Storage capacity E 10 200 m, 3.95 MB, 1 536 programs 600 m is required for "Pack specification when selected.
12 Compact flash memory (CF) 2 GB
F. Operation and display
13 Display on the screen in English
G. Input and output functions and devices
14 Remote buffer operation Protocol A (handshake type) Protocol B (DC control code type)
15 Binary operation Binary data
16 High-speed LAN linkage Host FTP server Protocol FTP Connecting cable 10 base-T
NOTE Following are customer's responsibility 1, Installation and set-up of LAN network 2, Connecting cable and connection to the LAN network Select one of the High-speed LAN linkage or Compact flash memory (CF) above.
H. S, T, M function
I. Tool compensation
17 Tool wear compensation memory
18 Three dimensional tool compensation G30/G31
19 Tool length offset in tool axial direction G143/G149 for 4-axis head
J. Coordinate
K. Operation support function
20 Hand wheel feed in tool axial direction for 4-axis head
21 Foreground plotting Tool path of current program on vertical spindle or tool will be displayed on the screen.
22 Manual centering function Check a workpiece and set a coordinate for machining automatically with help of special macro program
L. Programming support function
23 Teaching A program is regenerated based on operation in MDI and manual mode automatically, while the button is being pressed.
24 Programmable data input G58/G59
25 Fixture offset data input G158
26 Scaling G64/G65

27 Figure copy G721/G722
28 Circle cutting by compensation Radius is adjusted in circle cutting.
29 Estimation of machining time and NC plotting function
30 Pattern cycle conversion to normal extended program A short program of pattern cycle is converted to popular program constructed with many blocks
31 Zone machining A portion in a wide machining area is specified to shift Z axis in small amount in order to modify shape of it without changing basic machining program
M. Compensation function for mechanical accuracy
32 Thermal expansion compensation on Z axis
N. Machine support function
O. Automation support function
33 Skip function G61 for several measuring function
34 Tool breakage/wear detection
35 Counting tool working time.
36 Spare tool selection A spare tool will be selected automatically when a tool had such trouble as life, breakage, wear
37 Retract function At the time of tool breakage
38 Program check and creation of slated tool Format in the program for next operation will be checked and prepare a tool list in it while a current program is working.
39 Interruptive macro A macro program is activated by a external signal o interrupt machine movement.
40 Output of additional M code M192, M193
P. Safety and maintenance
Q. Servo system
41 Shape recognition preview positioning control (CNC shape II)
42 NRBS interpolation
R. Others
43 Tool tip position control for optional 4-axis head
44 Assembly error compensation on 5 axis head for optional 4-axis head
45 Thermal expansion compensation on 5 axis head for optional 4-axis head

Various kind of Attachments

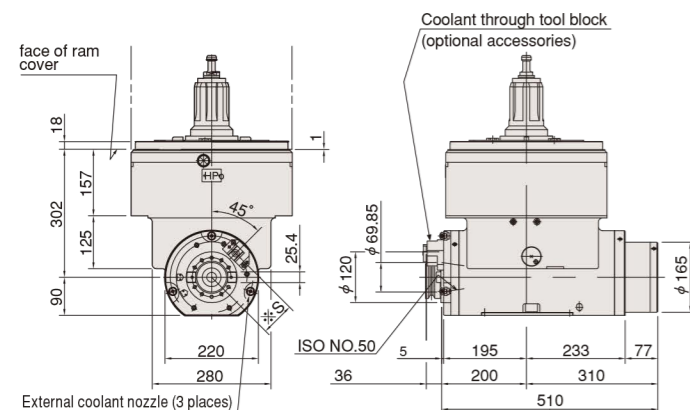
Standard accessory

■ Snout 240



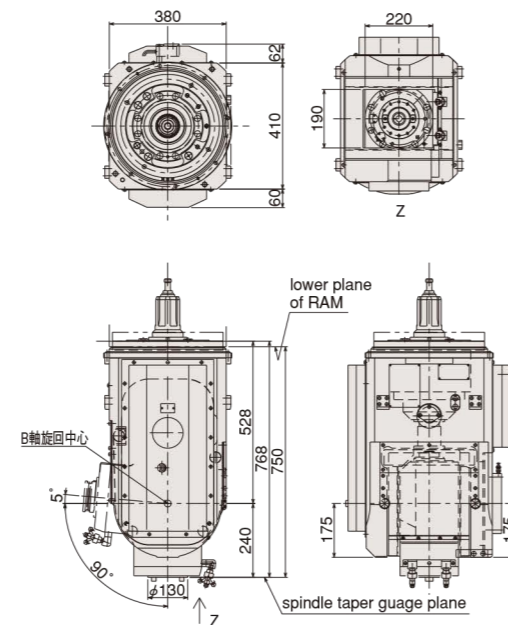
Optional attachment

11 0.07N angle head

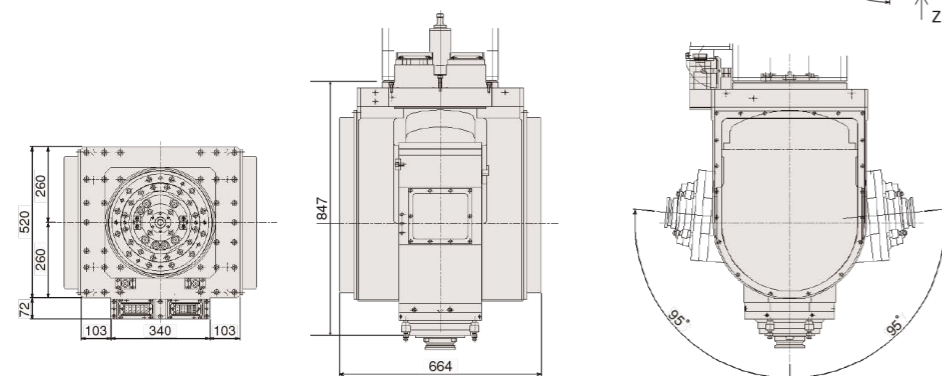


- 1) maximum power : 100min⁻¹/7kW
- 2) maximum torque : 686N · m {70kgf · m}
- 3) maximum speed : 5000min⁻¹
- 4) ※Size "S" becomes 80mm if there is no special mention in specifications

12 1 degree indexing head

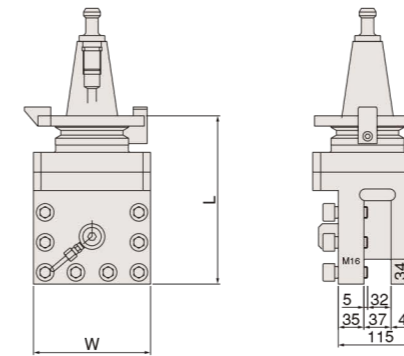


13 4-axis head



Turning Tool holders (optional accessory)

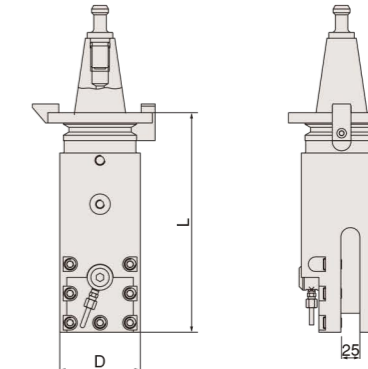
■ Square turning tool holder



(Unit mm)

Type	L	W	Mass (kg)
(1) S-3M910	230	160	30

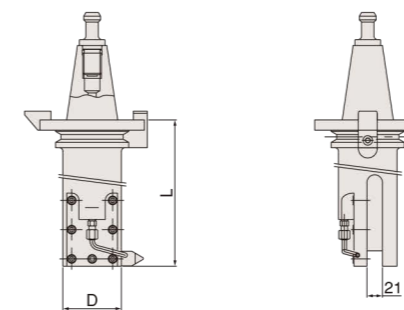
■ Boring holder BFP



(Unit mm)

Type	L	D	Mass (kg)
(2) S-9K746#1	250	110	18.5
(3) S-9K746#2	300	110	22.5
(4) S-9K746#3	350	110	26.5

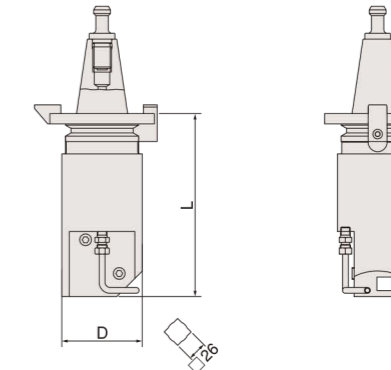
■ Boring holder BFP



(Unit mm)

Type	L	D	Mass (kg)
(5) S-9K747#1	200	80	12.4
(6) S-9K747#2	250	80	14.4
(7) S-9K747#3	300	80	16.4
(8) S-9K747#4	350	80	18.4

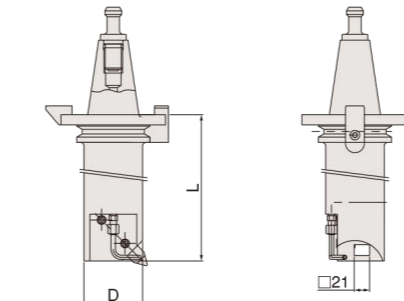
■ Boring holder BA



(Unit mm)

Type	L	D	Mass (kg)
(9) S-9K748#1	250	110	18.5
(10) S-9K748#2	300	110	22.3
(11) S-9K748#3	350	110	25.9

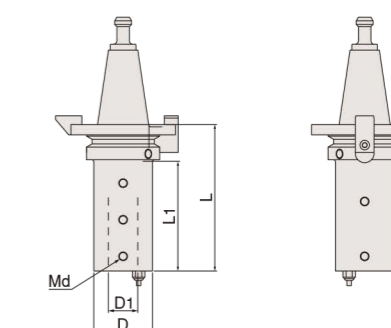
■ Boring holder BA



(Unit mm)

Type	L	D	Mass (kg)
(12) S-9K749#1	200	80	12.9
(13) S-9K749#2	250	80	14.9
(14) S-9K749#3	300	80	16.9

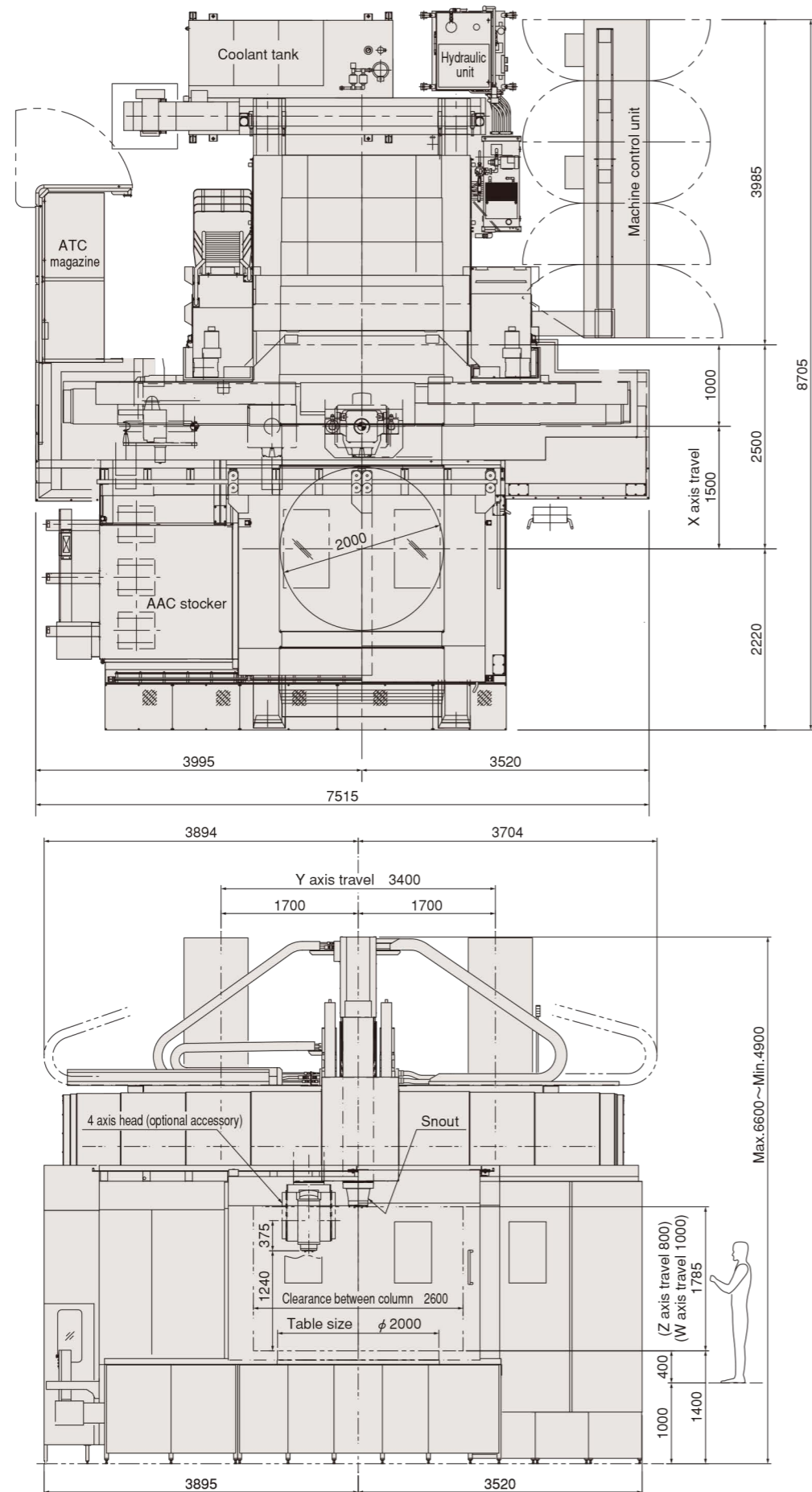
■ Side lock holder



(Unit mm)

Type	L	L1	D	D1	Md	Mass (kg)
(15) S-9K750#1	150	100	65	25	M10	8.8
(16) S-9K750#2	180	130	72	32	M10	9.9
(17) S-9K750#3	200	150	80	40	M12	11
(18) S-9K750#4	250	200	90	50	M16	13.4
(19) S-9K751#1	200	150	98	63	M16	11.6
(20) S-9K751#2	200	150	110	68	M16	13.5

General view and Layout



Large and wider machining space

