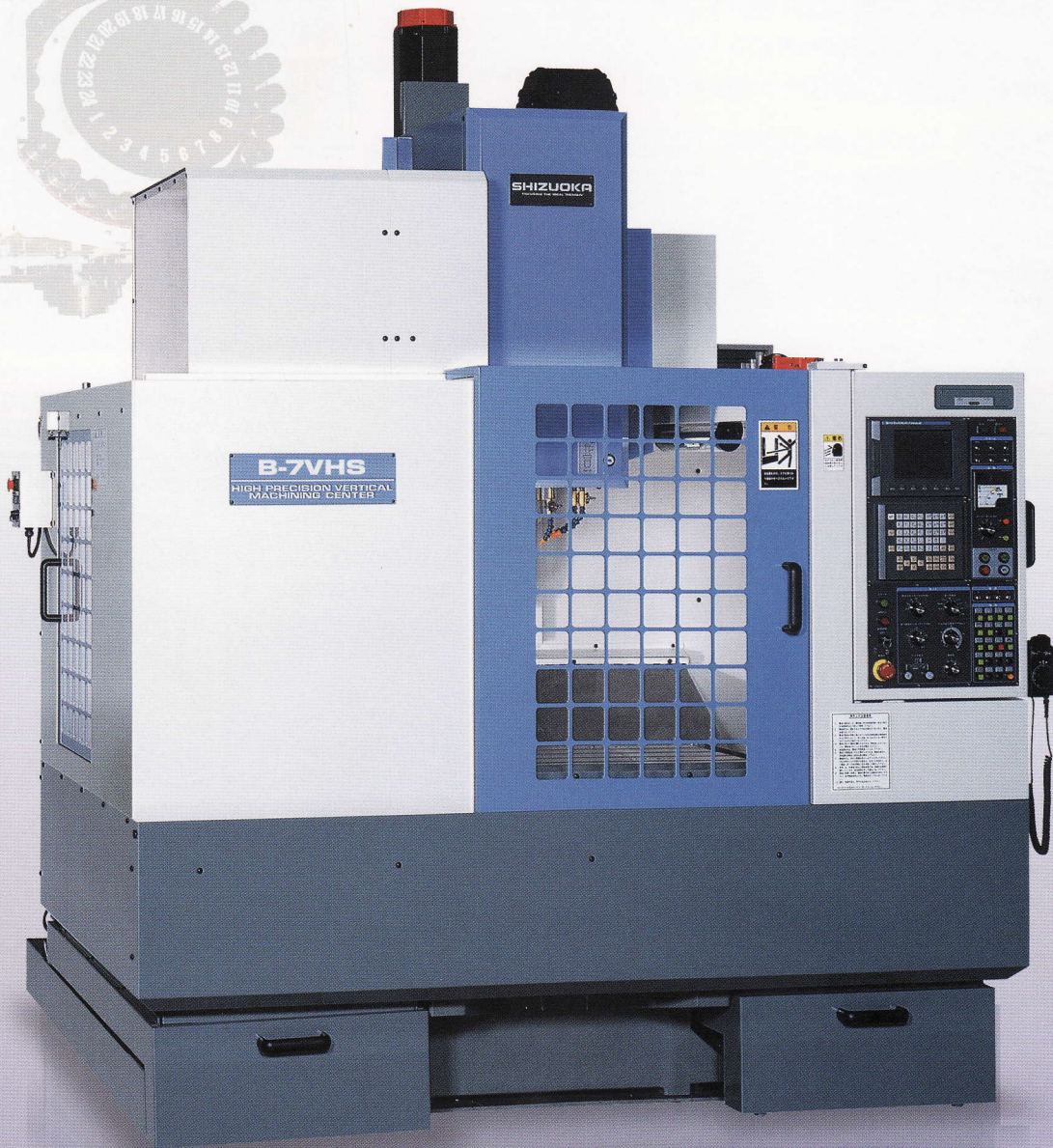HIGH SPEED & HIGH PRECISION VERTICAL MACHINING CENTER

SHIZUOKA
FOCUSING THE IDEAL "NEXGEN"

B-7VHS

SHIZUOKA MACHINE TOOL CO., LTD.

FOCUSING THE IDEAL "NEXGEN"

FOCUSING THE IDEAL "NEXGEN"
Product creation by our company is performed under the motto of "Focusing the ideal next generation machines" viz. Aiming at prducing newer and better machines enable to cope with requirements and needs at much more customers.

HIGH PRECISION VERTICAL MACHINING CENTER

SHIZUOKA
FOCUSING THE IDEAL "NEXGEN"

B-7VG

B-7VG
HIGH PRECISION VERTICAL
MACHINING CENTER

SHIZUOKA MACHINE TOOL CO., LTD.
FOCUSING THE IDEAL "NEXGEN"

Two Types of Machining Center in Response to Customer's Request

Models B-7VG and B-7VHS have been developed based on customer's request for "higher precision", "wide working area", "high speed rapid traverse", "heavy machining" and etc.

## Square slide guides employed in all the slide-ways realize the wider guide and higher cutting stability

A rigid box shape body has been employed for the bed and the column while square slide guides for all the slide-ways. The width of the guides equivalent to that of the one class upper type has been employed, resulting in remarkable increase of stability in heavy machining processing.

Travel Amount
X-axis 710mm (28.0 inch)
Y-axis 510mm (20.1 inch)
Z-axis 510mm (20.1 inch)

Table Size
1,000×510mm (39.4×20.1 inch)

The Width of the Guide
X-axis wise 415mm (16.3 inch)
Y-axis wise 720mm (28.3 inch)
Z-axis wise 400mm (15.4 inch)

Square slide guides applied to all the axes

415 (16.3 inch)

720 (28.3 inch)
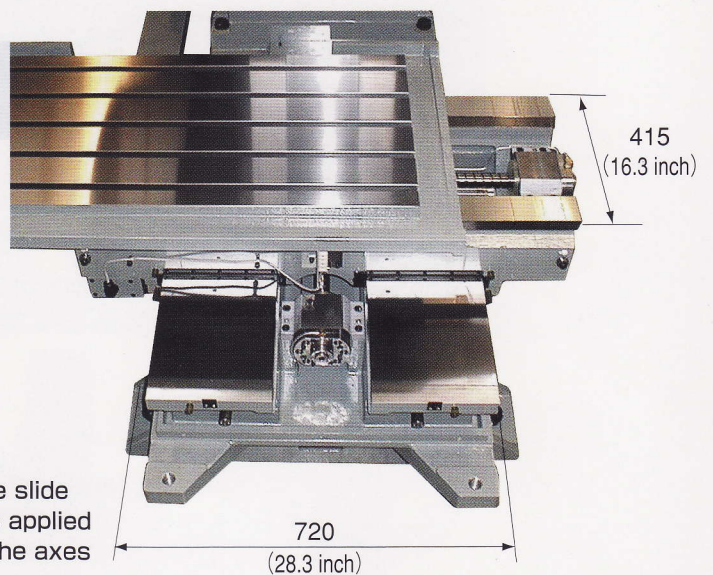
Original main spindle structure and high power motor allow wide application from heavy machining to high speed cutting

●B-7VG for Heavy Machining

High precision and high rigid combined angular bearings are employed in the gear type main spindle. Driven by the high power AC inverter motor and the two-speed gear, B-7VG can be applied not only to low speed heavy machining but to high speed cutting.
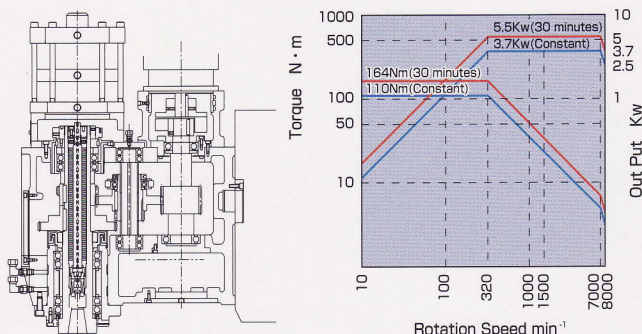
Main Spindle Motor Output : 5.5kW/3.7kW (30min/Constant)
Main Spindle rotation Speed : 20 to 8.000min^{-1}

●B-7VHS for High Speed Cutting

The main spindle consisting of the oil fog lubrication system combined with high rigidity & high precision ceramic bearings to allow high speed processing and the wound-rotor type built-in motor with power as high as 11kw have been employed, allowing wide range processing of various materials at high and low speed.
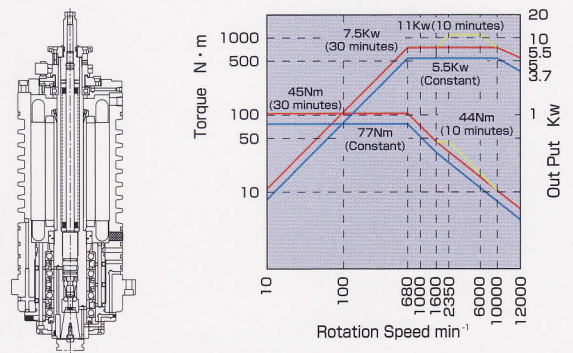
Main Spindle Motor Output : 11kW/7.5kW/5.5kW (10min./30min/Constant)
Main Spindle Rotation Speed : 120 to 12,000min^{-1}

High Speed Cam Type ATC and Memory Random Type Magazine

The double arm type ATC driven by high speed cam enables quick and reliable tool change. For indexing the magazine with up to 24 tools storage capacity, memory random type equipped with the software easiest to use has been employed.

Tool Storage Capacity : 24 tools
Tool Selection System : Memory Random
Time Required for Tool Change : 1.2 second (Tool to Tool)
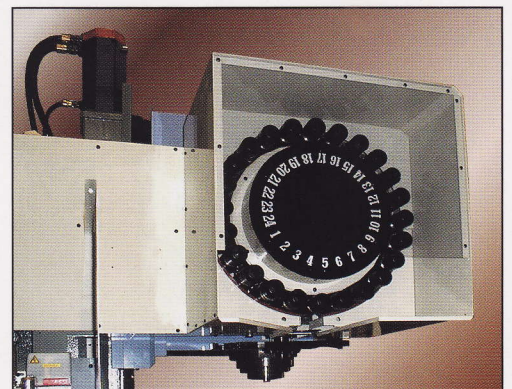
● Standard Specification

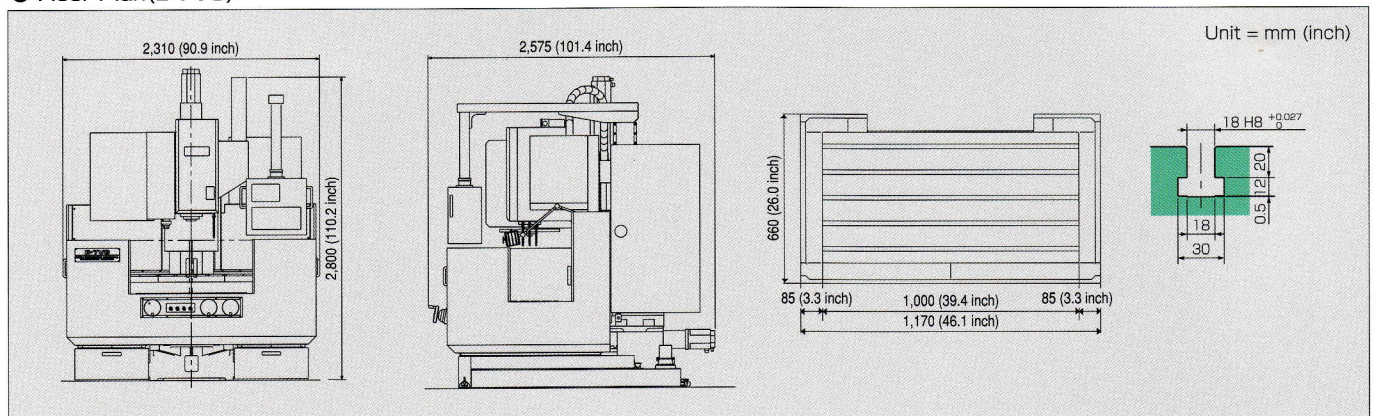|	Description	B-7VG	B-7VHS
Travel Amount	X-axis (Table Crosswise)	710mm (28.0 inch)	
	Y-axis (Table Longitudinal)	510mm (20.1 inch)	
	Z-axis (Spindle Head Vertical)	510mm (20.1 inch)	
	Distance from table surface to spindle nose	140 ～ 650mm (5.5 ～ 25.6 inch)	
	Distance from column surface to spindle center	550mm (21.7 inch)	
Table	Table Size	1,000 × 510 mm (39.4×20.1 inch)	
	Maximum Load Weight	700kg (1,540 lbs)	
	Top Shape	18mm T-slot × 100mm pitch × 5	
	Height from floor to top	780mm (30.7 inch)	
Main Spindle	Rotation Speed	20～8,000min⁻¹	120～12,000min⁻¹
	Speed Change Range	Step-less (Direct Command/L-H Auto Switch)	
	Tapered Bore	7/24 Tapered	
	Bearing Inside Diameter	φ70mm (φ2.8 inch)	φ75mm (φ3.0 inch)
Feed Rate	Rapid Feed Rate (X, Y)	32,000mm/min (1,260 inch/min)	
	(Z)	18,000mm/min (709 inch/min)	
	Cutting Feed Rate	1～10,000mm/min (0.04 ～ 394 inch/min)	
ATC Unit	Tool Shank Type	MAS BT40	
	Pull-stud Type	MAS P40T Special (90°)	
	Tool Storage Capacity	24 Tools	
	Maximum Tool Diameter / with no neighboring tools	φ75/φ125mm (2.9/4.9 inch)	
	Maximum Tool Length	300mm (11.8 inch)	
	Maximum Tool Weight	8kg (17.6 lbs)	
	Method of Tool Selection	Memory Random	
	Tool Change Time	1.2 Sec. (Tool to Tool)	
Motor	Motor for Main Spindle (30 min/Constant.)	AC5.5 / 3.7 kw (30 min/Constant.)	AC11/7.5 /5.5 kw (10 min/30 min/Constant.)
	Motor for Feed Axes (X, Y)	AC 1.0kW	
	(Z)	AC 1.5kW	
	Motor to Cool Main Spindle	0.5kW	1.7kW
	Motor for Coolant	0.18kW	
	Motor for ATC Magazine	0.5kW	
	Motor for ATC Arm	0.75kW	
Tank Capacity	Main Spindle Bearing Lubricant Tank	6L (1.6 gal) Head Gear Box	0.7L (0.2 gal) Micron Lub
	Slide Way Lubricant Tank	1.8L (0.5gal)	
	Main Spindle Oil Supply Tank	—	40L (10.6 gal)
	Coolant Tank	250L (66gal)	
Power Consumption	Power Supply (AC 200/220V)	13kVA	18kVA
	Pneumatic	0.6MPa、100 L/min(Atmospheric Pressure)	0.6MPa、300 L/min(Atmospheric Pressure)
Machine Size	Height	2,800mm (110.2 inch)	
	Width x Depth	2,310mm×2,575mm (91×101.4 inch)	2,340mm×2,440mm (92.1×96.1 inch)
	Weight (including NC system)	5,000kg (11,000 lbs)	
The Others	Cover	Half Cover	Full Cover
	Handle	3-axes Round Handle	One-axis Manual Pulse Handle

● Standard Accessories

· Main Spindle Cooling System
· Front Door Interlock (B-7VHS)
· ATC Door Interlock (B-7VHS)
· Lighting Equipment (B-7VHS)
· Panel Door Interlock
· Coolant Oil System
· Slide Way Auto Lubrication Unit

● Special Specification

☐ 3-axes Manual Pulse Handle (B-7VHS)
☐ Automatic Centering Function (B-7VHS)
☐ Automatic Tool Length Measurement (B-7VHS)
☐ Additional Axes (up to 4 axes, 5 axes) (B-7VHS)
☐ Additional Axis (up to 4 axes) (B-7VG)
☐ Lighting Equipment (B-7VG)
☐ Oil Mist (2L, 4L)
☐ Chip Flow Coolant
☐ Automatic Positioning Coolant

☐ High Pressure Coolant
☐ Mist Collector
☐ Coolant Oil Cooler
☐ Coolant Oil Ring Nozzle
☐ Designated Color
☐ Chip Air Blower
☐ Patrol Light (Single Step, Double Step, Triple Step)
☐ Rigid Tap

☐ Broken Tool Detector System (Corresponding to the Limit Switch)
☐ Chip Conveyor
☐ Scale Feedback
※The Circular Table shall be separately necessary for the additional axes.

● Floor Plan(B-7VG)

Unit = mm (inch)

2,310 (90.9 inch)   2,575 (101.4 inch)
2,800 (110.2 inch)
660 (26.0 inch)
85 (3.3 inch)   1,000 (39.4 inch)   85 (3.3 inch)
1,170 (46.1 inch)
18 H8 +0.027/0
18
30

● Standard Control System Specification

Description	B-7VG	B-7VHS
Control System	FANUC 20i-FA	FANUC 18i-M
Control Axes	Three Axes, Three-Axis Simultaneous Control	
Minimum Travel Unit	0.001mm (0.0001 inch)	
Minimum Command Unit	0.001mm (0.0001 inch)	
Interpolation Function	Positioning, Linear Interpolation, Circular Interpolation	
Command Method	Absolute/Incremental	
Tape Code	EIA/ISO Auto Discriminant	
Tape Storage Length	40 m	
Display	8.4in Liquid Crystal, Color	7. 2in Liquid Crystal, Monochrome
Main Spindle Rotation Speed Command	S-Code Direct Command (S4 Digits)	S-Code Direct Command (S5 Digits)
Main Spindle Rotation Override	50 to 120% of Commanded Rotation Speed (by every 10%)	
Feed Rate Command	F-Code Direct Command (F5 Digits)	
Feed Rate Override	100 to 200% of Commanded Speed (by every 10%)	
Rapid Feed Override	5%, 25%, 50% and 100% of Commanded Rapid Feed Speed	
Fraction Feed(*O, **O, ***O)	Positioning to Zero of the Designated	–
Manual Pulse Handle	0.001, 0.01 and 0.1mm / pulse (0.0001, 0.001, 0.01 inch/pulse)	
Tool Number Command	Memory Random Command by T-Code (T2 Digits)	
Tool Dia. Compensation	G40 through G42	
Tool Length Compensation	G43 through G44 and G49	
Tool Position Offset	–	G45 through G48
Tool Compensation Set	64 Sets	
Fixed Cycle	G73, G76, G80 through G89, G98 and G99	
Work Coordinate System Selection	G54 through G59	
Coordinate System Set	G52, G53	
Man./Auto Origin Reset	Return to Machine Origin and/or Proper Positions, G27 through G29	
Misc. Function Command	Miscellaneous Function Command by M-Code (M2 Digits)	
Directorized Program	63 Programs	
Sub-Programs	4 Sub-Programs	
Background Edit	(Option)	Program Edit/Memory in Auto Mode
Input/Output Interface	RS-232C/Memory Card	
Mirror Image	X, Y, Z	

Machining Guidance Function		
· Linear Machining	Linear Machining at Designated Angle	
· Circular Arc	Circle or Circular Arc Machining at Designated Radius	
· Corner R/C Machining	Circular Arc(R)/Chamfering(C) Machining at the Corner between Two Straight Lines	
· Pocket Machining	Inside Machining of the fixed Form Such as Circle, Quadrangle, and Track	
· Pattern Positioning	Positioning to Designated Position of 5 Patterns	
· Surface Machining	Surface Machining of Rectangle with Designated Dimensions	
· Side Machining	Side Machining of Circle, Quadrangle and Track, and Inside Machining of Circle	
· Limit Machining	Limiting the Designated Rectangular Region and Machining the Inside	
· Rough Machining	Limiting the Designated Rectangular Region and Rough Machining the Inside	
· Boring	Center Drilling, Drilling and Tapping	
· Centering	Centering of Quadrangle and Circle, and Corner Detection	
· Teaching	Storage and Repetition of Guidance Machining	
· Graphic Display	Confirmation of Finished Graphic	

● Other Specification (Common to B7VG/B7VHS)

· Dry Run
· Single block
· Optional Block Skip
· Backlash Compensation

· Machine Lock
· Z-Axis Neglect
· Miscellaneous Functions Lock
· Buffer Register

· Decimal Point Input/Desk Calculator Type Dec. Point Input
· Radius R-Command
· M30 Automatic Power Off
· DNC Operation (Memory Card/External Data Units Required)
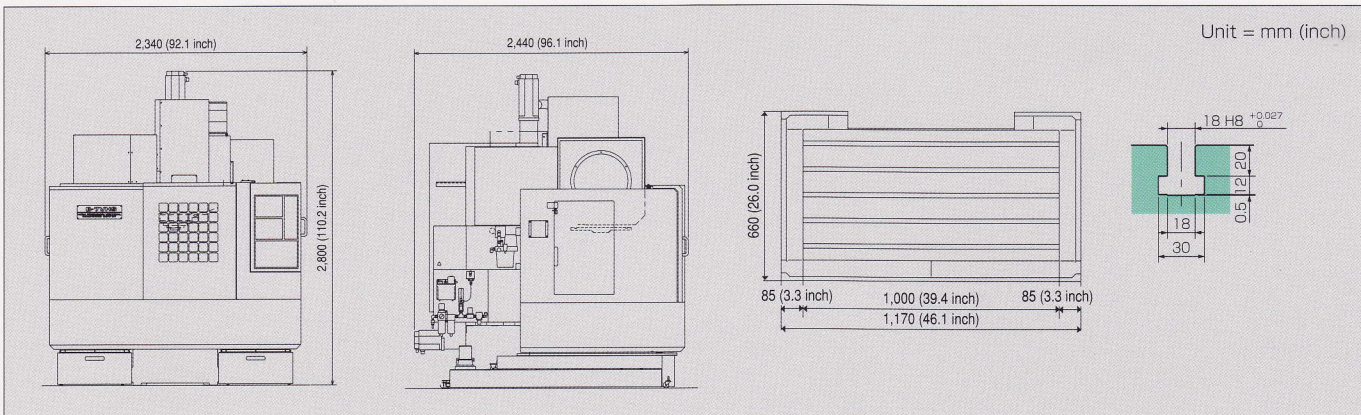
● Special Specification

(As for *marked items, available only in B-7VHS)

Options Common to B-7VG and B-7VHS

☐ Directorized Program Quantity Addition
  (125, 200 and 400 Additional Programs)
☐ Tape Storage Length Extension
  (80,160, 320,640*,1280*m)
☐ Play Back
☐ Rigid Tap Function
☐ Dynamic Graphic Function
☐ G10 Data Input
☐ Program Restart
☐ Scaling
☐ Coordinate Axes Rotation
☐ Display of Operation Time and Parts Quantity
☐ Clock Function
☐ Memory Card (8, 16, 32, 64MB)
☐ Memory Card Attachment
☐ Automatic Corner Override
☐ Remote Buffer
☐ Handle Interruption
☐ Program Input of Offset Amount
☐ One-Way Positioning
☐ Helical Machining
☐ Anticipatory Control
☐ Programmable Mirror Image
☐ Extended Tape Edit
☐ Tool Compensation Memory (B, C)

Options Dedicated to B-7VG

☐ Background Edit
☐ Guidance Programming Function
☐ Profile Programming
☐ Polygon Limit Machining
☐ Machining Guidance Tool Compensation Function

Options Dedicated to B-7VHS

☐ Offset Memory Quantity Addition
  (99, 200 and 400 Memory)
☐ Custom Macro
☐ F1 Digit Feed
☐ Automatic Corner Deceleration/Acceleration
☐ Tool Duration Control
☐ Sequence Number Check Suspension
☐ Designated Angle Chamfering and Corner Rounding
☐ Three Dimensional Tool Compensation
☐ Interactive Automatic Programming Function
  (with Dynamic Graphic Function)
☐ Polar Coordinate Command
☐ Polar Coordinate Interpolation
☐ Circular Arc Interpolation
☐ Exponential Interpolation
☐ Involute Interpolation
☐ Data Server (Applicable Local Area Network)
☐ High Speed Remote Buffer
☐ High Accurate Profile control (HPCC with RISC)
☐ NURBS Interpolation

● Floor Plan (B-7VHS)

Unit = mm (inch)

2,340 (92.1 inch)
2,800 (110.2 inch)
2,440 (96.1 inch)
660 (26.0 inch)
85 (3.3 inch) 1,000 (39.4 inch) 85 (3.3 inch)
1,170 (46.1 inch)
18 H8 +0.027/0
18 12 20
0.5
18
30

※Specifications and outer appearance given in this catalogue shall be subject to changes without any previous notice for further improvement of products.

Circular Arc and Slant Cutting Available Freely Due to 3-Axes Round Handle and Machining Guidance Function Equipped as Standard (B-7VG)
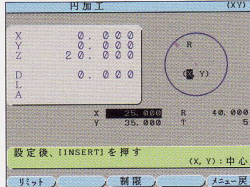
In B-7VG, round handles separately provided with respective axes realize as excellent operability as that of a manual machine. Besides, various and diversified machining guidance functions equipped as standard permit not only circular arc or linear machining but many kinds of pocket machining or pattern positioning. Machining of flat/side surface and corner using a handle operation or a jog function will be available freely just by selecting the proper pattern and then inputting the data, where programming technique is no longer necessary.
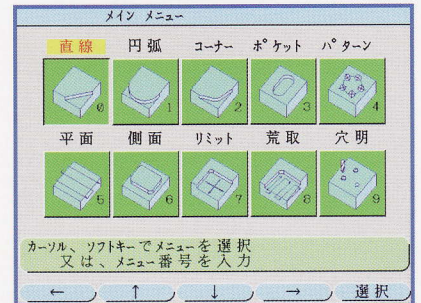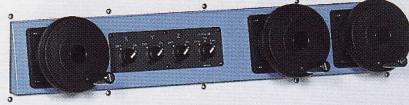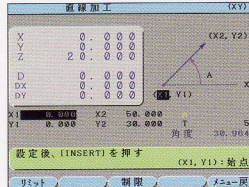
0. Linear Machining
1. Circular Arc Machining
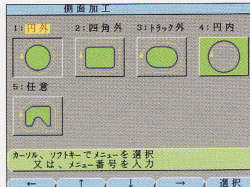### 2. Corner Machining
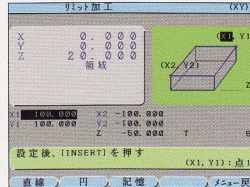### 3. Pocket Machining
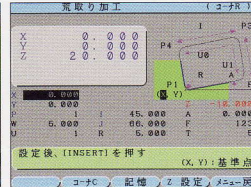### 4. Pattern Positioning
5. Flat Surface Machining
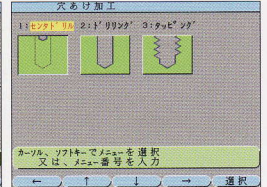### 6. Side Surface Machining
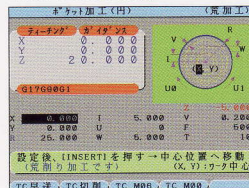### 7. Limit Machining
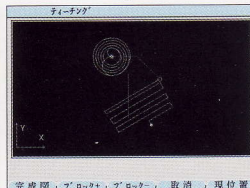### 8. Rough Machining
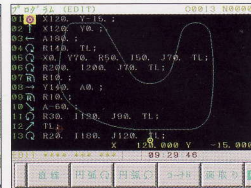### 9. Boring
10. Teaching
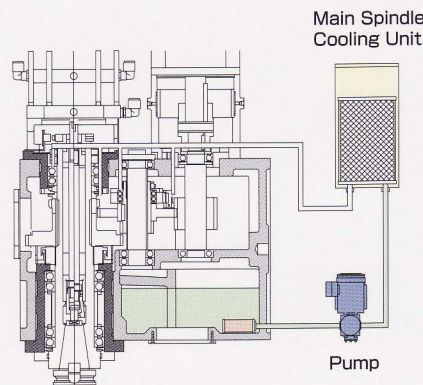### 11. Teaching Confirmation
12. Centering
13. Profiling (Option)
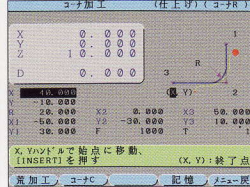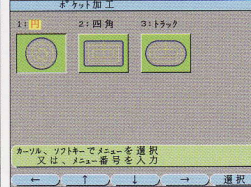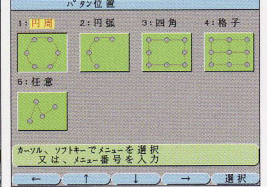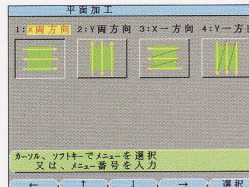
Cooling Units Suitable to Respective Main Spindles Equipped as Standard for Thermal Measure

In B-7VHS, cooling effect of air provided through oil fog lubrication as well as the separate type main spindle cooling unit will cool down the high speed main spindles in themselves. In B-7VG for heavy cutting, lubricant flowing through the cooling unit mounted on the rear part of the machine is to circulate through respective parts of the head, which cools the whole body of the head. These prevent the heat generated in the head from transmitting to the machine body, minimizing the thermal displacement. For the cooling units for both models, a room temperature aligning type has been employed.

B-7VG

Main Spindle Cooling Unit

Pump

B-7VHS

←(Oil Fog)

Main Spindle Lubrication Unit

Main Spindle Cooling Unit