

# NSV Series

Ultra High Performance Vertical Machining Center



**YCM**®

# NSV Series

## *Ultra High Performance Vertical Machining Center*

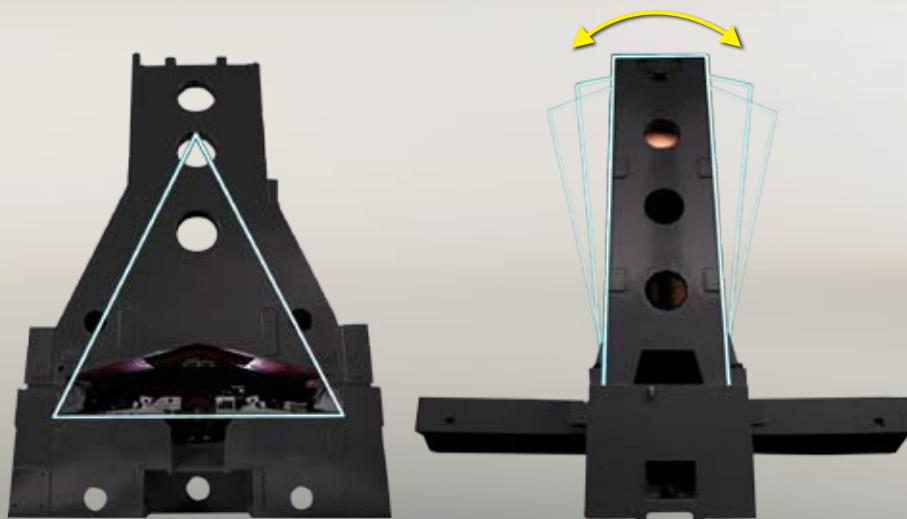
The NSV series ultra high performance vertical machining center is specially designed for high speed and high efficiency machining applications. The NSV series is built with a large delta machine column and wide base to ensure the highest stability during high speed movement.



	<b>NSV 66A</b>	<b>NSV 102A</b>	<b>NSV 102AM</b>	<b>NSV 156A</b>
<b>X</b>	50 m/min. 1,969 ipm	60 m/min. 2,362 ipm	24 m/min. 945 ipm	48 m/min. 1,890 ipm
<b>Y</b>	50 m/min. 1,969 ipm	60 m/min. 2,362 ipm	24 m/min. 945 ipm	48 m/min. 1,890 ipm
<b>Z</b>	48 m/min. 1,890 ipm	48 m/min. 1,890 ipm	24 m/min. 945 ipm	48 m/min. 1,890 ipm

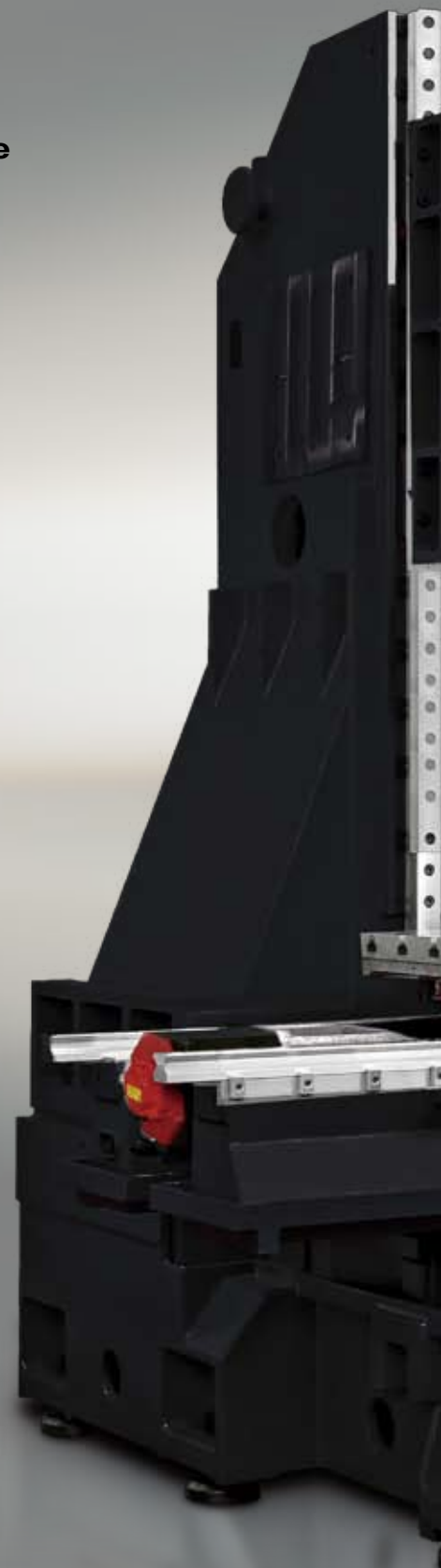


- Extra Large Delta Machine Column
- Double-nut Ball Screw with High Performance Axial Servo Motor
- Roller Type Guideways on All Axes
- Wide Distance Between Guideways



**NSV Series**

**Normal Design**





Advanced design with reinforced body structure through **FEM** analysis, the NSV series offers superb cutting performance and reduced vibration to meet the highest machining demand.





## ISOLATED DIRECT DRIVE SPINDLE

The unique IDD spindle design offers low spindle vibration and optimal heat isolation that result in excellent surface finish while maximizing both spindle and tool life under hard milling conditions



■ Micro Oil-air Lubrication System



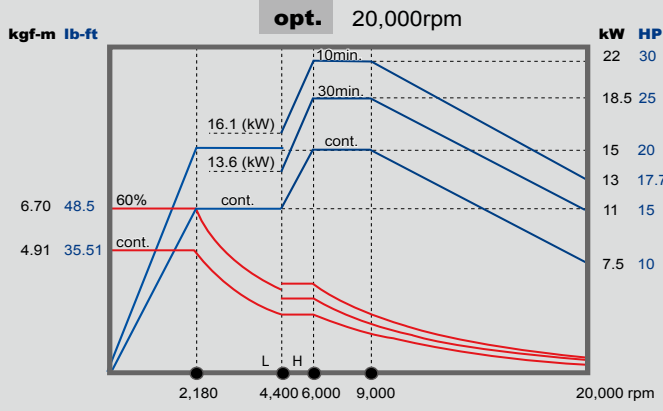
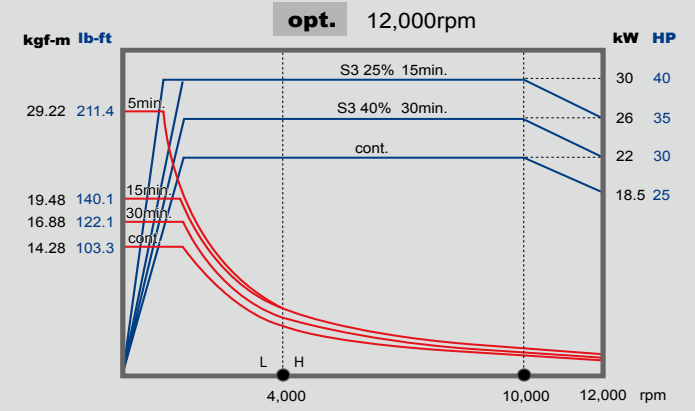
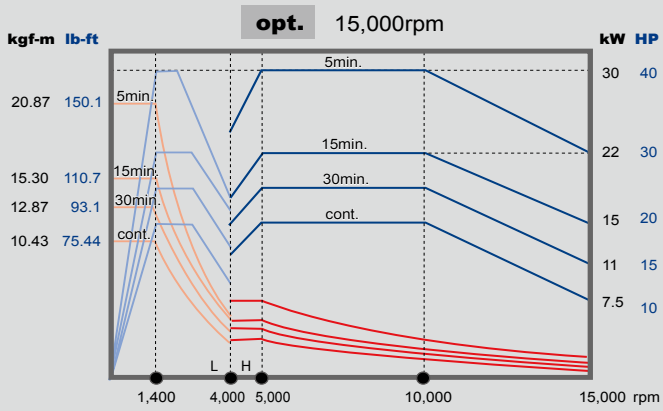
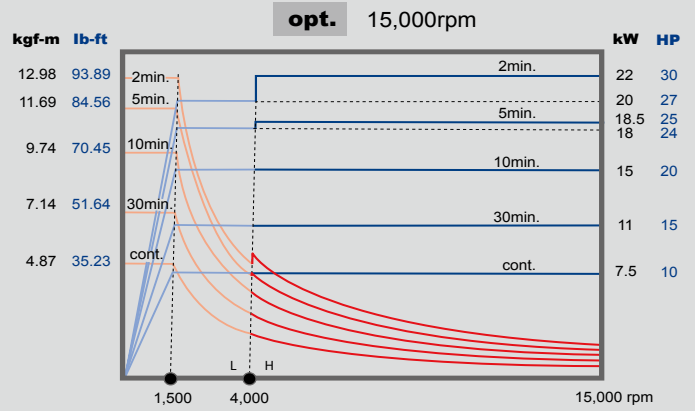
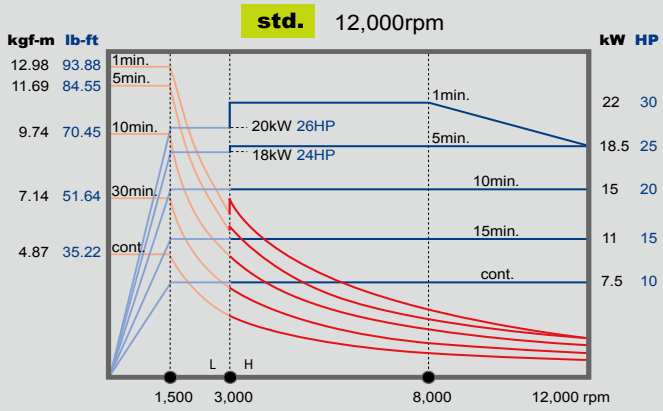
■ Reliable Helical Disc Spring  
■ Simultaneous Taper & Flange Contact Design

# POWER CHART

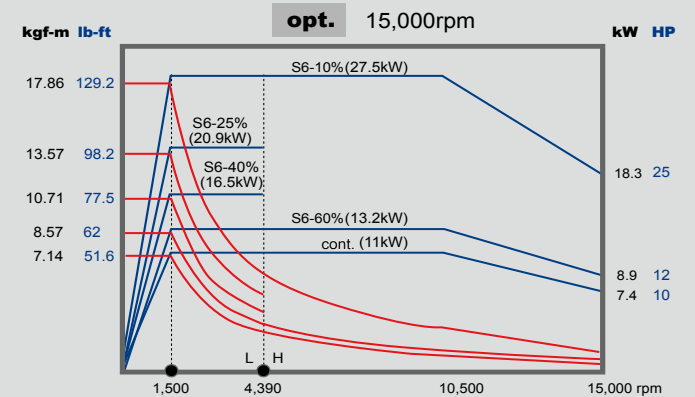
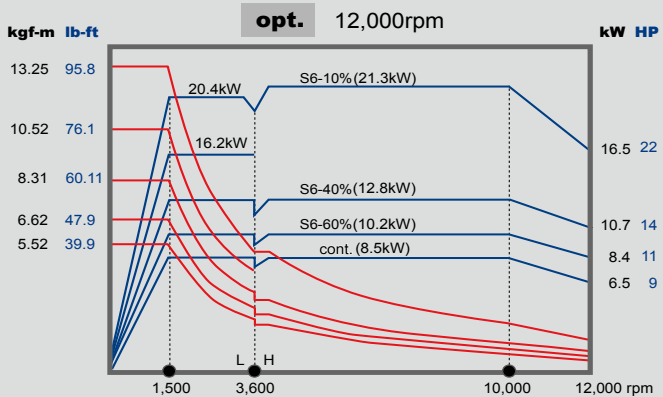
POWER

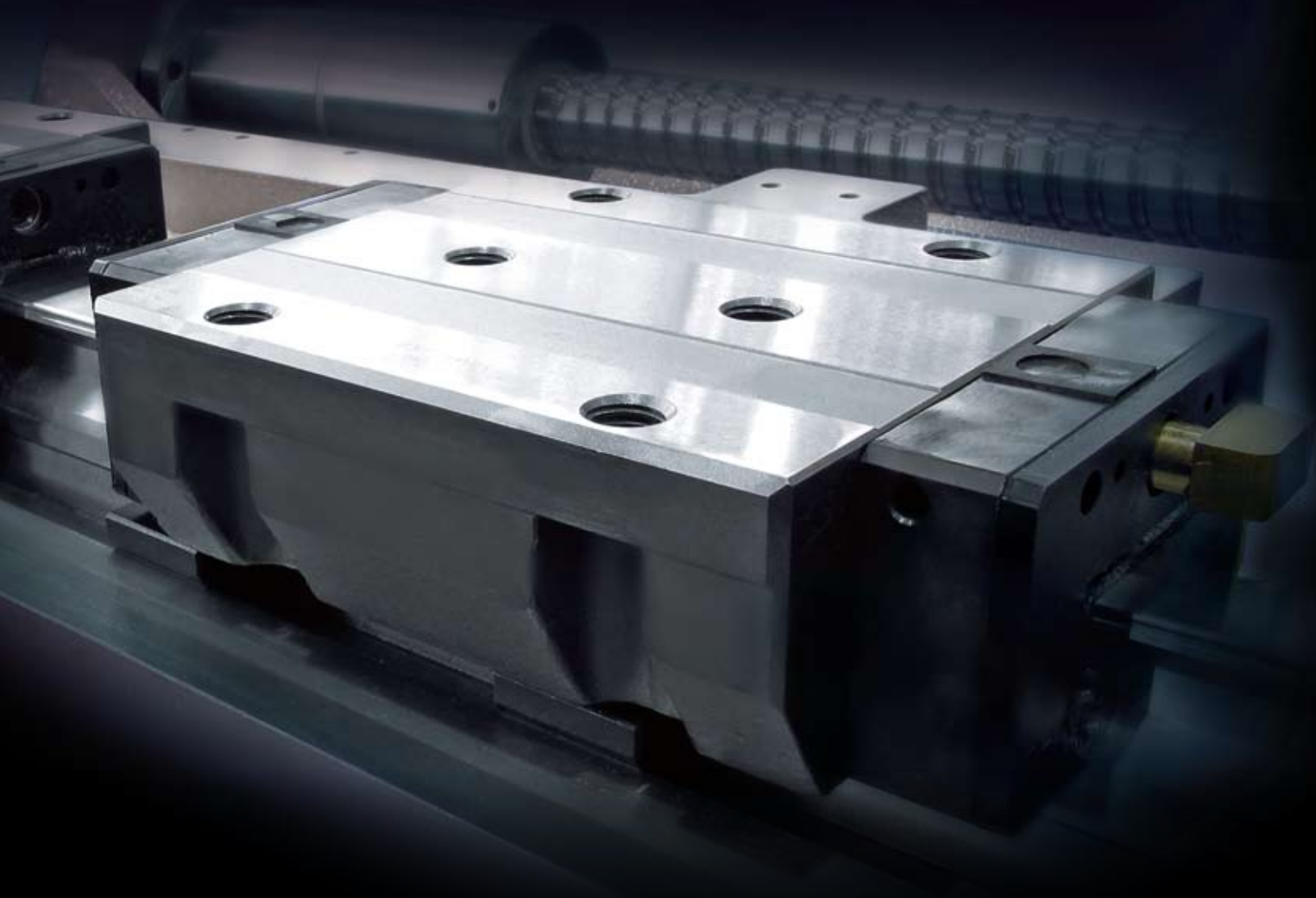
TORQUE

## FANUC System

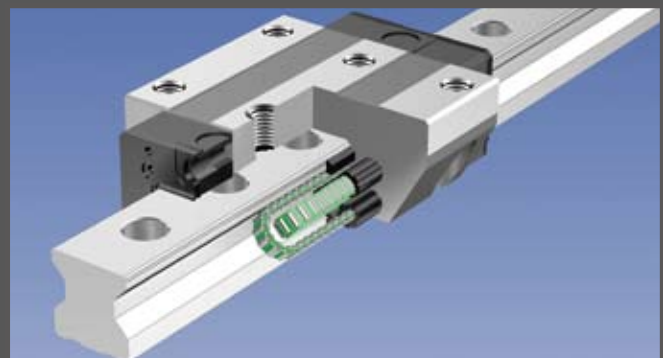


## HEIDENHAIN System



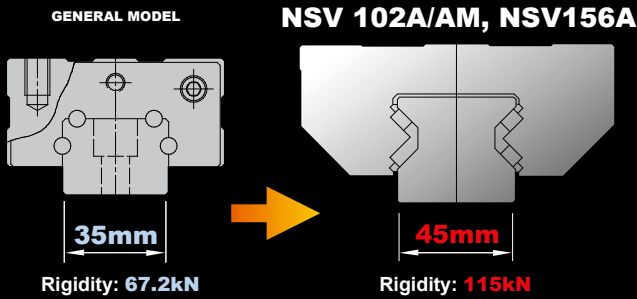


- All Roller Type Guideways
- Onepiece Motor Housing
- Double-nut Ball Screw
- 6 Slider Blocks on X-axis  
(NSV102A/NSV156A)





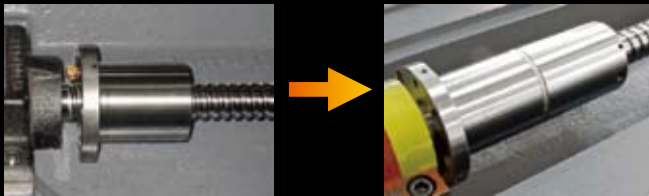
## All Roller Type Guideways



**+70%**

RIGIDITY INCREASED BY

## Double-nut Ball Screw



**GENERAL MODEL**  
Diameter:  $\varnothing 40\text{mm}$   
Rigidity: 62kgf/ $\mu\text{m}$   
Load Capacity: 2,207kgf

**NSV Series**  
Diameter:  $\varnothing 45\text{mm}$   
Rigidity: 151kgf/ $\mu\text{m}$   
Load Capacity: 5,090kgf

**+140%**

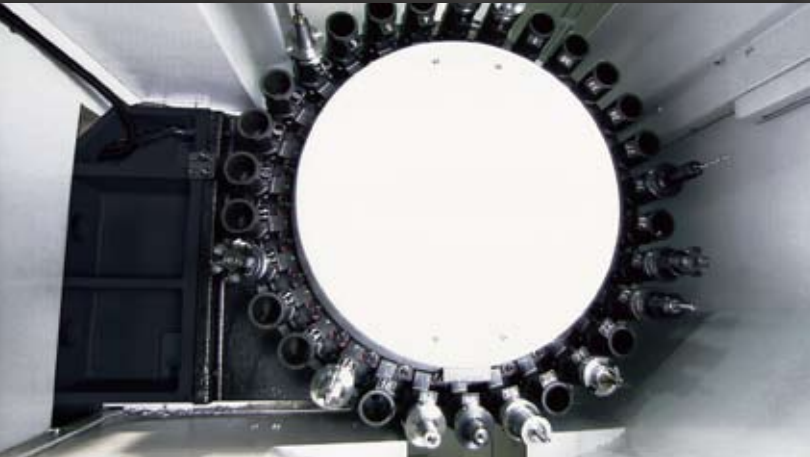
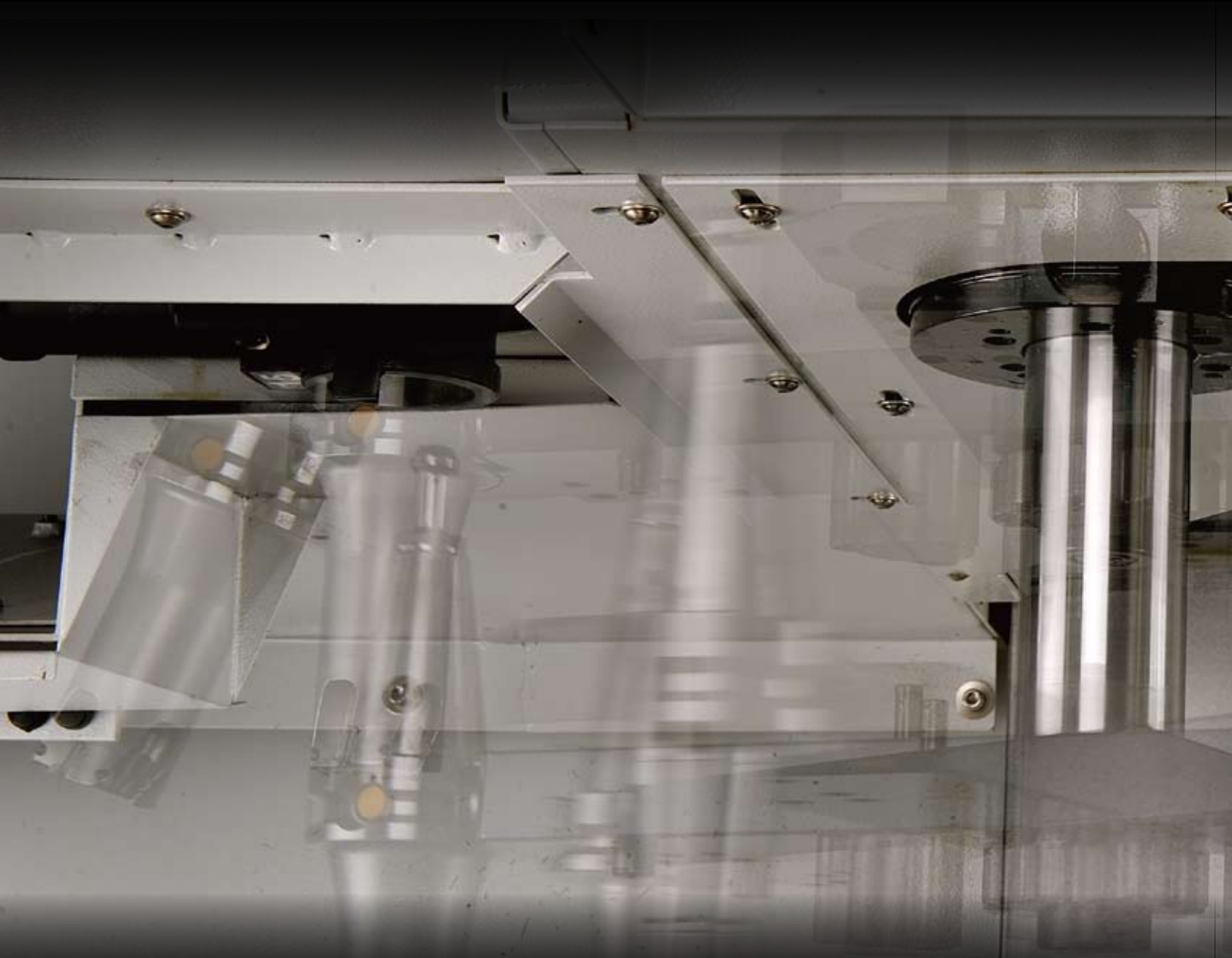
RIGIDITY INCREASED BY

**+130%**

LOAD CAPACITY INCREASED BY



# RELIABLE TOOL MAGAZINE SYSTEM





**1.8 Sec. Tool to Tool**  
**3.4 Sec. Chip to Chip**



- Column Mounted Design  
Minimizes the Vibration During  
Tool Change
- Standard 30T Tool Magazine
- 48/60T Servo Driven Tool  
Magazine (opt.)
- Automatic Chip Shield

# NSV 102A

## Ultra High Performance Vertical Machining Center

The NSV102A is specially designed for high speed and high efficiency machining applications. Capable of reaching a maximum axial acceleration of 1g and X/Y/Z 60/60/48 m/min. rapid feedrate. The NSV102A is perfect for automotive, job-shop and aerospace applications.



### Cutting Capacity **BBT40** 12,000rpm Fanuc System

**FACE MILL** **S45C Steel**

Material Removal Rate  
**675**  
cc/min.



Tool  $\varnothing 63$  mm x 5T  
Spindle Speed 1,500 rpm  
Feedrate 4,500 mm/min.  
Width of Cut 60 mm  
Depth of Cut 2.5 mm

**FACE MILL** **S45C Steel**

Depth of Cut  
**6**  
mm



Tool  $\varnothing 80$  mm x 5T  
Spindle Speed 600 rpm  
Feedrate 450 mm/min.  
Width of Cut 60 mm

**END MILL** **S45C Steel**

Depth of Cut  
**4**  
mm



Tool  $\varnothing 32$  mm x 3T  
Spindle Speed 500 rpm  
Feedrate 225 mm/min.  
Width of Cut 32 mm

**U-DRILL** **S45C Steel**

Cutter Diameter  
 **$\varnothing 44$**   
mm



Tool  $\varnothing 44$  mm x 1T  
Spindle Speed 1,500 rpm  
Feedrate 150 mm/min.  
Depth of Cut 34 mm

**TAP** **S45C Steel**

Tapping  
**M24**



Tool M24 x 3P  
Spindle Speed 60 rpm  
Feedrate 180 mm/min.  
Depth of Cut 24 mm

**RIGID TAP** **A6061 Aluminum**

Tapping  
**M1.2**



Tool M1.2 x 0.25P  
Spindle Speed 1,200 rpm  
Feedrate 300 mm/min.  
Depth of Cut 2.5 mm

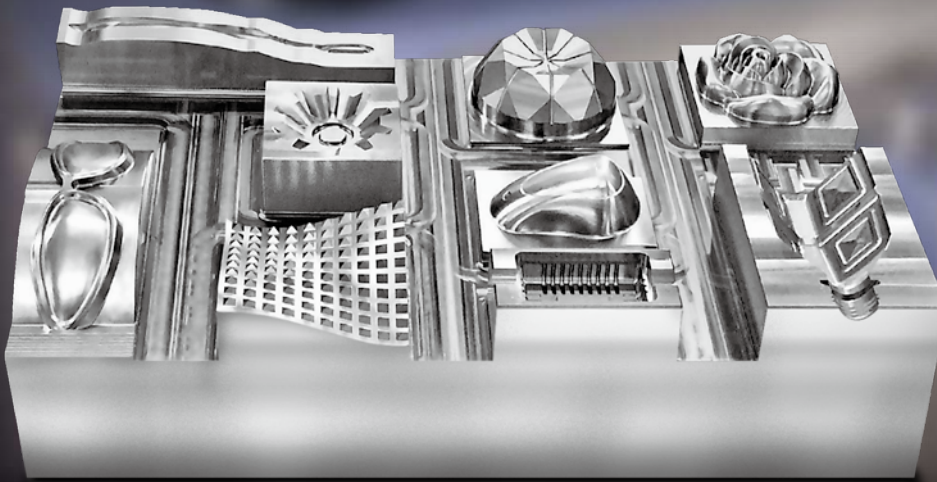
Note: Above cutting test was performed by NSV 102A with 12,000 rpm spindle. Cutting test data for reference only. All cutting tests are designed to demonstrate maximum machining capabilities without preserving tool life.

# NSV 102AM

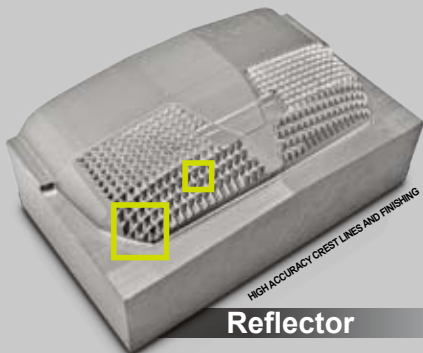
## High Precision Die & Mold Vertical Machining Center

The high precision NSV102AM meets your demands for die & mold machining of automotive, mechanic and electronic industries.

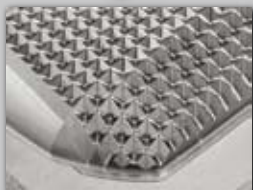
Specially designed for die & mold industry. With perfect machine structure, high controllability and stability, it builds excellent cutting accuracy. High-speed and stable operation not only significantly reduce tryout time but also speed up developing process.



High Precision  
Die & Mold



Reflector



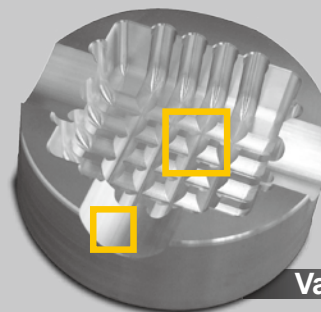
**Material** NAK-80 (HRC-40°)  
Pre-hardened mold steel

**Size** W : 92mm  
D : 56mm  
H : 26mm



**Tooling Speed** R0.5-BEN  
15,000rpm

**Feedrate** 1,500mm/min.



Vacuum Mold



**Material** P20

**Size** ø100 x 35mm



**Tooling Speed** R1.5-BEN  
20,000rpm

**Feedrate** 1,200mm/min.

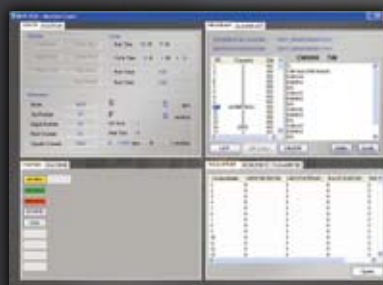
# MXP-200 FB/FC

YCM CONTROL  
by FANUC

- High Response AC Digital Servo & Spindle Drives with High Definition
- AICC II High Speed High Accuracy with Auto Switching on/off Machining
- JERK Control Function (opt.)
- High Rigidity Tapping, Helical Interpolation
- Custom Marco B and Tool Path Graphics
- Manual Guide i with large Screen Display . (MXP-200FC, opt.)
- Program File Management for Easy Program Classifying
- USB Interface for Easy Parameters & CNC Programs Transfer
- 512KB Memory
- High Speed Positioning Function (MXP-200FC, opt.)
- Memory Card Program Edit & Operation (opt.)
- 3D Interference Check (5-axis control as standard)
- NANO Smoothing Function (opt.)
- 400 pairs tool offset, 1,000 total registered programs
- 48 pairs of workpieces coordinate system
- Extended parts program editing (cut, copy, and paste. maximum 4,000 characters)

## i-Direct A remote monitoring system

The YCM Production Line Monitoring System i-Direct overcomes the limitations of time and distance. This software provides plant operators with instant production status, including production value, output, standby, alarm time, status display and malfunction records of the machine. These data could be browsed online and printed. When incidents occur, i-Direct will automatically warn plant operators through e-mail or MMS message. With i-Direct Production Line Monitoring System the plant operators can easily keep track of production statuses regardless of time and distance.



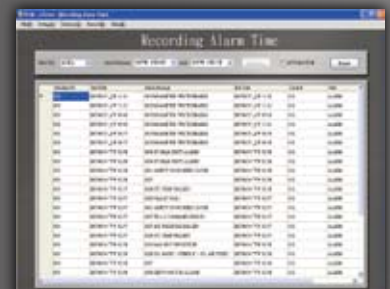
Single Machine Status Browsing  
Machine Status Browsing



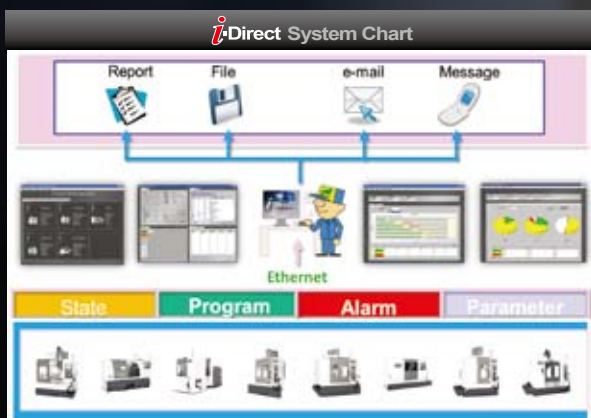
Plant Operation Status Monitoring



Machine connection, MMS and e-mail settings



Machine Status Time Record



Production Status Process Record



Production Management Statistics

# i-OPERATION *Plus II*

Software Enhancement Exclusively from YCM



## Pre-machining Preparation

**Intelligent Tool Data Management**  
Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine



**Tool Length Measurement**  
Graphic measuring interface provides automatic tool length measurement function



**Workpiece Coordinate Calculation**  
Conversational operating window provides convenient and fast setup of workpiece coordinates



**NEW**

## RENISHAW GUI System (Conversational Graphic Operating Interface)

Tool measurement & measurement correction



Workpiece measurement



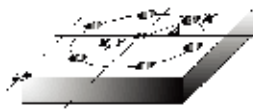
## Programming

**NEW**

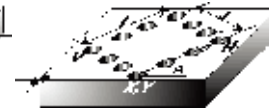
### i-PATTERN



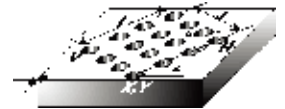
15 sets of machining cycle program  
Reduces program input and memory time  
Graphic interface & conversational command input



CIRCULAR HOLE PATTERN  
(G120 P1) Function



RECTANGULAR HOLE PATTERN  
(G120 P4) Function

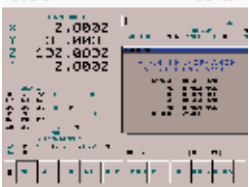


GRID HOLE PATTERN  
(G120 P5) Function

## Machining

### High Performance Machining Mode M300

With 5 sets of parameter settings, the users choose the most suitable mode for optimum machining



### High Speed Machining Mode M400

Increases drilling and tapping speed, reduces machining time for job shop and precision mold machining



**NEW**

### Tool Load Management

Instant tool load monitoring with alarm function



### Multi-display Function

Displays 4 statuses simultaneously with configurable status display



**NEW**

### Tool Life Management

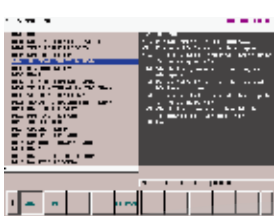
Indicates tool status of each group with tool life alert



## Instant Message Alert

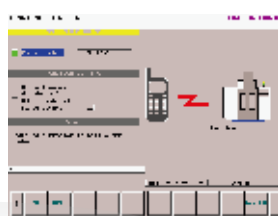
### Pop-up Alarm Display

Instantly provides troubleshooting procedure  
Quick response to alarm



### Wireless Message Notification

Machine status sent to a designated cellphone number.



## Maintenance

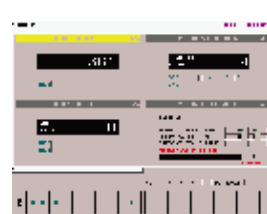
### Intelligent Maintenance



Provide users with periodic maintenance options and descriptions

Instantly provide users with maintenance notifications

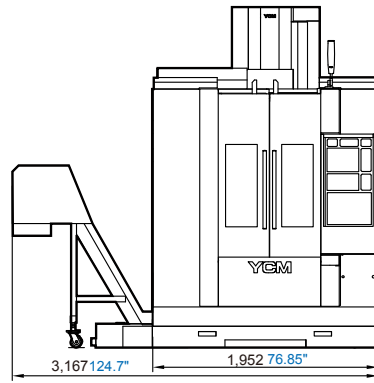
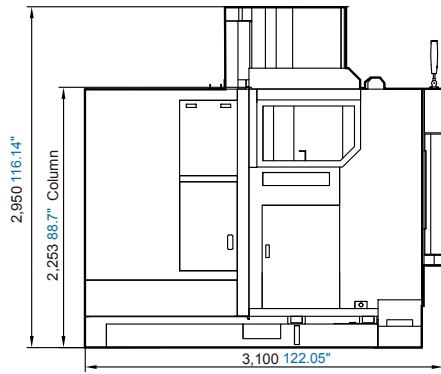
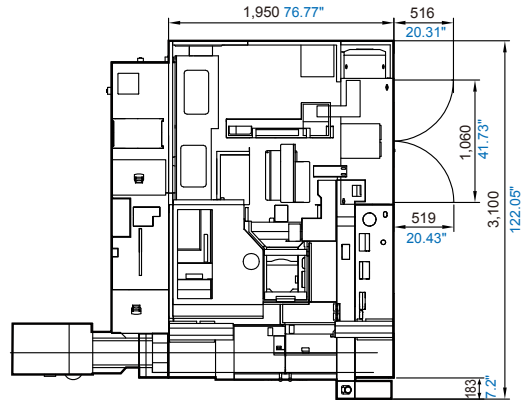
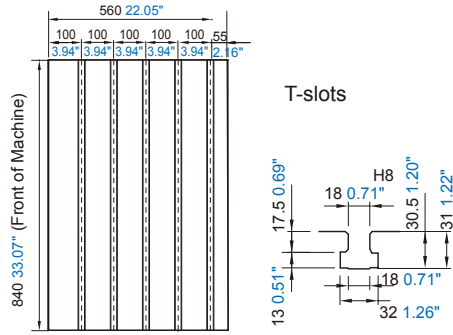
### Counter Function



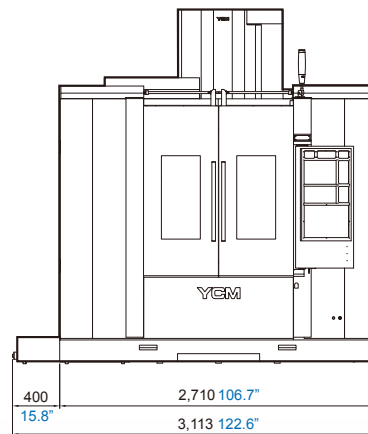
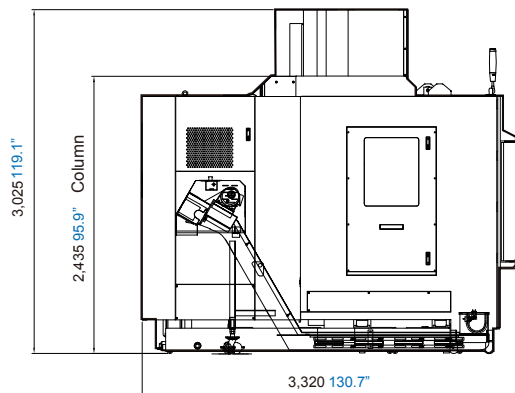
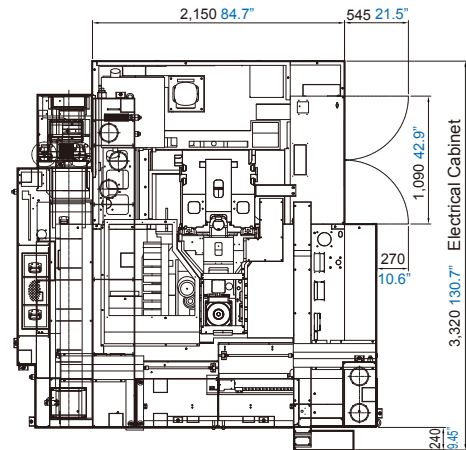
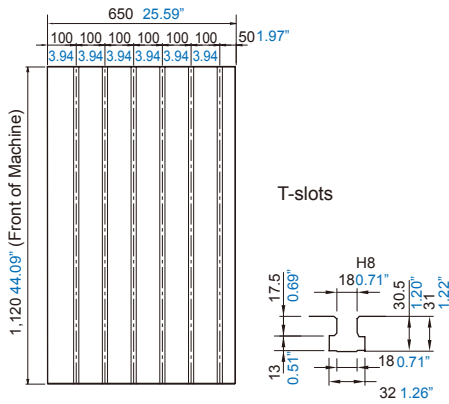
Allow users to keep count of workpieces with the function of overtime cycle alarm provides easy control over machining cycle time

1. Main Counter
2. Periodical Counter
3. Daily Counter
4. Over Cycle Alarm

**DIMENSIONS** Unit: mm inch **NSV66A**

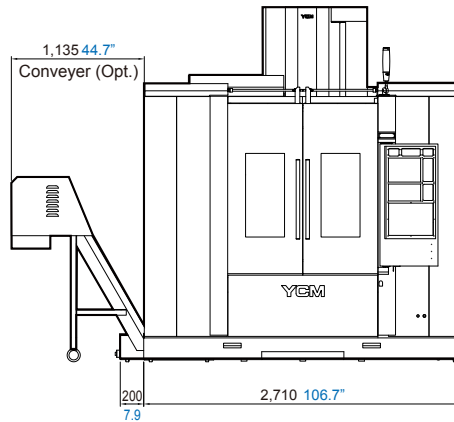
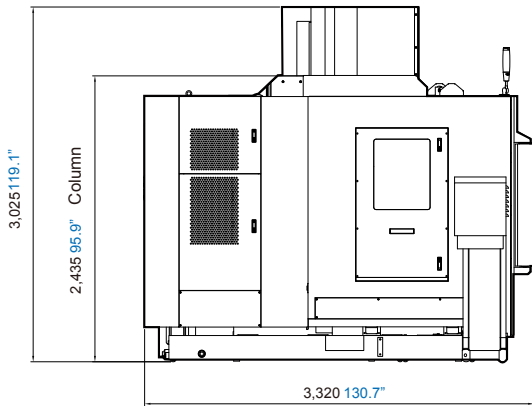
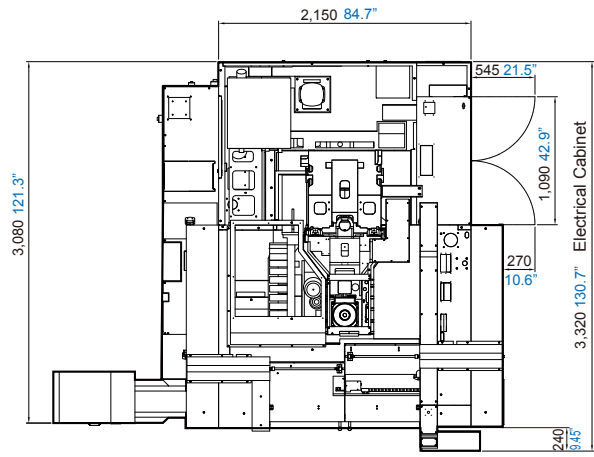
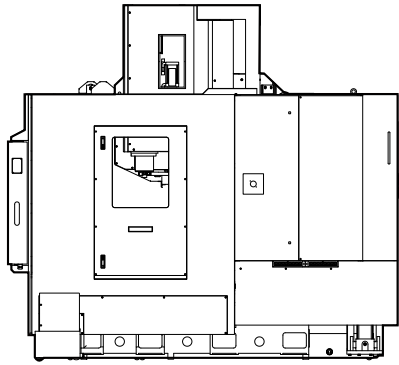


**NSV102A / AM** ■ Triple-Chip Auger

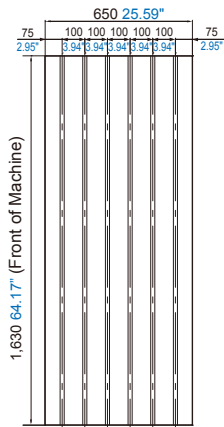




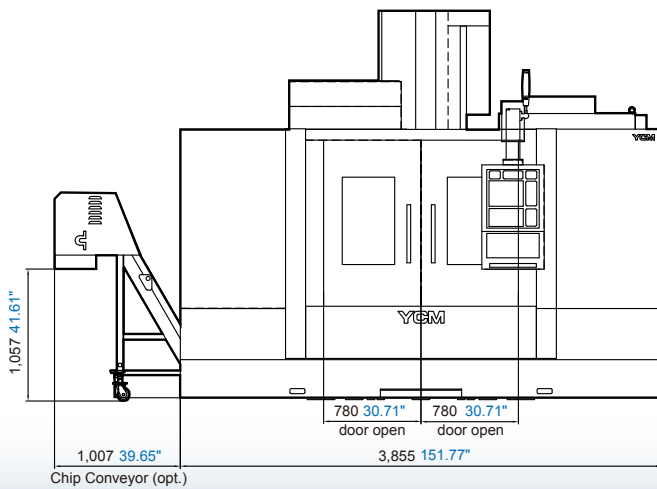
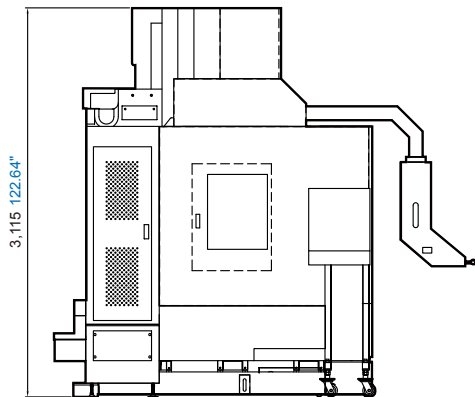
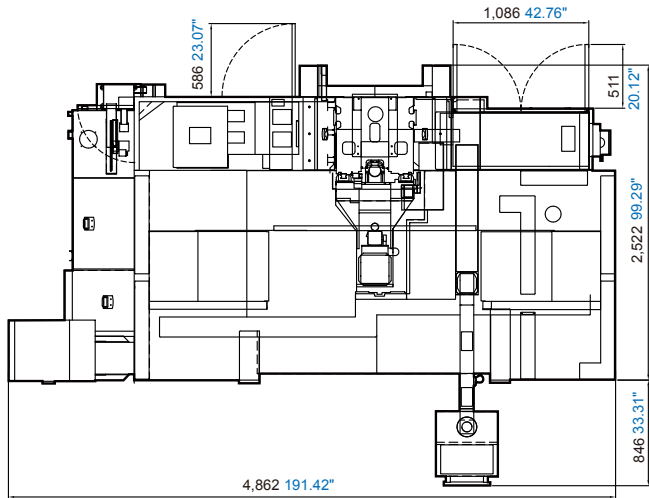
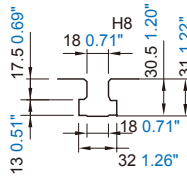
# NSV102A / AM ■ Dual-Chip Auger



# NSV156A



T-slots



# SPECIFICATIONS

	NSV 66A	NSV 102A	NSV 102AM	NSV 156A		
<b>SPINDLE</b>						
Spindle Speed / Spindle Power (std.)	12,000rpm 7.5 / 11 / 15 / 18.5 / 22 kW 10 / 15 / 20 / 25 / 30HP (cont. / 15min. / 10min. / 5min. / 2min.)	12,000rpm 7.5 / 11 / 15 / 18.5 / 22 kW 10 / 15 / 20 / 25 / 30HP (cont. / 15min. / 10min. / 5min. / 1min.)				
Spindle Speed / Spindle Power (opt.1)	15,000rpm 7.5 / 11 / 15 / 18.5 / 22 kW 10 / 15 / 20 / 25 / 30 HP (cont. / 15min. / 10min. / 5min. / 1min.)	15,000rpm 15 / 18.5 / 22 / 30 kW 20 / 25 / 30 / 40HP (cont. / 30min. / 10min. / 5min.)				
Spindle Speed / Spindle Power (opt.2)	-	12,000rpm 22 / 26 / 30 kW 30 / 35 / 40HP (cont. / 30min. / 15min. / 5min.)	-			
Spindle Speed / Spindle Power (opt.3) (NSV102AM)	-	-	20,000rpm 15 / 18.5 / 22 kW 20 / 25 / 30HP (cont. / 30min. / 15min.)	-		
Spindle Taper (opt.)	BBT40					
<b>TRAVEL</b>						
X-axis Travel	660 mm 25.98"	1,020 mm 40.16"	1,530 mm 60.24"			
Y-axis Travel	510 mm 20.08"	600 mm 23.62"	650 mm 25.59"			
Z-axis Travel	560 mm 22.05"	600 mm 23.62"	610 mm 24.02"			
Distance Between Spindle Nose & Table Top	100~660 mm 3.94"~25.98"	100~700 mm 3.94"~27.56"	80~690 mm 3.15"~27.17"			
<b>TABLE</b>						
Table Size	840 x 560 mm 33.07" x 22.05"	1,120 x 650 mm 40.16" x 25.59"	1,630 x 650 mm 64.17" x 25.59"			
No. T-slots x Size x Pitch	5 x 18 mm x 100 mm 5 x 0.71" x 3.94"	6 x 18 mm x 100 mm 6 x 0.71" x 3.94"				
Max. Load on Table	500 kg 1,102 lb	1,000 kg 2,205 lb	1,500 kg 3,307 lb			
<b>FEEDRATE</b>						
Rapid Feedrate (X/Y/Z)	50/50/48 m/min. 1,969/1,969/1,890 ipm	60/60/48 m/min. 2,362/2,362/1,890 ipm	24/24/24 m/min. 945/945/945 ipm	48/48/48 m/min. 1,890/1,890/1,890 ipm		
Cutting Feedrate	1~20,000 mm/min. 0.04 ~787ipm					
<b>ACCURACY</b>						
	ISO 10791-4	YCM*	ISO 10791-4	YCM*	ISO 10791-4	YCM*
Axial Travel	Full Length					
Positioning (X/Y/Z) A	0.025/0.025/0.025 mm 0.00098"/0.00098"/0.00098"	0.01/0.01/0.01 mm 0.00039"/0.00039"/0.00039"	0.032/0.025/0.025 mm 0.00126"/0.00098"/0.00098"	0.01/0.01/0.01 mm 0.00039"/0.00039"/0.00039"	0.042/0.025/0.025 mm 0.00165"/0.00098"/0.00098"	0.014/0.01/0.01 mm 0.0006"/0.00039"/0.00039"
Repeatability (X/Y/Z) R	0.015/0.015/0.015 mm 0.00059"/0.00059"/0.00059"	0.007/0.007/0.007 mm 0.00028"/0.00028"/0.00028"	0.018/0.015/0.015 mm 0.0007"/0.00059"/0.00059"	0.007/0.007/0.007 mm 0.00028"/0.00028"/0.00028"	0.02/0.015/0.015 mm 0.0008"/0.00059"/0.00059"	0.01/0.007/0.007 mm 0.0004"/0.00028"/0.00028"
*All values shown above are measured for the machine in good air-conditioned environments.						
<b>ATC</b>						
Tool Magazine Capacity (opt.)	30T (40T)	30T (48T / 60T)				
Max. Tool Weight (per piece)	6kg 13.2 lb					
Max. Tool Dimensions	ø76 x 300mm ø3" x 11.8"					
Max. Tool Dimensions (w/o adjacent tools)	ø125 ø4.9"					
Tool Change Method	Arm Type					
Tool Selection Method	Random					
<b>GENERAL</b>						
Pneumatic Supplier	5.5kg/cm <sup>2</sup> 78.2psi					
Power Consumption (Transformer)	34kVA (40kVA)	55kVA (65kVA)	42.46kVA (45kVA)			
Machine Weight	6,500 kg 14,330 lb	7,000 kg 15,432 lb	9,000 kg 19,841 lb			

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms, etc. to improve the performance of the machine without notice.  
All the specifications shown above are just for reference.

## ACCESSORIES

●: Standard ○: Option -: None

	NSV 66A	NSV 102A	NSV 102AM	NSV 156A
Tool Kit	●	●	●	●
Work Lamp	●	●	●	●
Pilot Lamp	●	●	●	●
Coolant Gun	●	●	●	●
Coolant Equipment System	●	●	●	●
Cutting Air Blast	●	●	●	●
Spindle Air Blast	●	●	●	●
Spindle Air Seal	●	●	●	●
Central Lubrication System	●	●	●	●
Oil Skimmer	●	●	●	●
Coolant Through Spindle System	○	○	○	○
Foundation Bolts	○	○	○	○
Leveling Blocks and Bolts	●	●	●	●
Oil-mist Coolant System	○	○	○	○
Oil Hole Holder Function	○	○	○	○
Chip Conveyor	○	○	○	○
Workpiece Measurement System	○	○	○	○
Automatic Power Off	●	●	●	●
Heat Exchanger for Electrical Cabinet	●	●	●	●
A/C. Cooler for Electrical Cabinet	○	○	○	○
Mechanical, Electrical and Operating Manuals	●	●	●	●
Rigid Tapping	●	●	●	●
Guideway Cover (X/Y/Z)	●	●	●	●
Optical Scale	○	○	○	○
Automatic Door	○	○	○	○
Safety Door	●	●	●	●
4th Axis Rotary Table	○	○	○	○
Spindle Cooling System	●	●	●	●
Heavy Duty Coolant Pump	●	●	●	●
Auto Tool Length Measurement System	○	○	○	○
Full Chip Enclosure	●	●	●	●
Circular Coolant Nozzle	●	●	●	●
Triple-Chip Augers	-	●	●	-
Quad-Chip Augers	-	-	-	●
Air Gun	●	●	●	●
hydraulic System	○	○	○	○
Oil-mist Collector	○	○	○	○
CE	○	○	○	○
STC Plus	○	○	○	○
Paper Filter	○	○	○	○
Separator	○	○	○	○
CNC Control : MXP-200FB	●	●	●	●
CNC Control : MXP-200FC	○	○	○	○
CNC Control : HEIDENHAIN iTNC-530	○	○	○	○

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms, etc. to improve the performance of the machine without notice.  
All the specifications shown above are just for reference.

# VMC

## Vertical Machining Center

**FP Series** High Precision High Performance Die Mold Vertical Machining Center / High Precision Graphite Vertical Machining Center  
**FP55LX, FP66A, FP100A / FP66G**



**NXV Series** High Performance Vertical Machining Center  
**NXV560A, NXV1020A/AM, NXV1380A, NXV1680A/B**



**TV Series** Heavy Duty Vertical Machining Center  
**TV116B, TV146A/B, TV158B, TV188B, TV2110B, TV2610B**

**NTV Series** High Efficiency T-base Vertical Machining Center  
**NTV158A/B**

**NMV Series** High Performance High Rigidity Vertical Machining Center  
**NMV76A, NMV106A**



**WV Series** Ultra Wide High Performance Vertical Machining Center  
**WV108A/B**

**FX Series** High Performance 5-axis Vertical Machining Center  
**FX380A**

**NSV Series** Ultra High Performance Vertical Machining Center  
**NSV66A, NSV85A, NSV102A, NSV156A**



**NDV Series** High Precision Die Mold Vertical Machining Center  
**NDV66A, NDV85A, NDV102A**

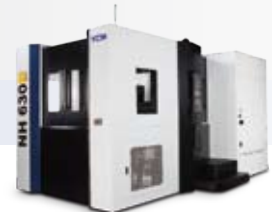
**TCV Series** High Performance Traveling Column Vertical Machining Center  
**TCV2000A, TCV3000A, TCV3000A-5AF, TCV3000A-5AX**



**DCV Series** Advanced Double Column Vertical Machining Center

**DCV2012A/B, DCV3016B, DCV4016B, DCV3021B, DCV4021B, DCV5021B, DCV6021B, DCV3025B, DCV4025B, DCV5025B, DCV4030B, DCV5030B, DCV6030B, DCV4035B, DCV5035B, DCV6035B, DCV2018A-5AX, DCV4030B-5AX, DCV5030B-5AX, DCV6030B-5AX, DCV4030B-5AF**

**NDC Series** High Performance Double Column Vertical Machining Center  
**NDC2016B, NDC3016B, NDC4016B, NDC2018B-AHC, NDC3018B-AHC, NDC4018B-AHC**



# HMC

## Horizontal Machining Center

**H Series** High Production Horizontal Machining Center  
**H500A/B, H630B, H2612B**

**NH Series** High Speed High Precision Horizontal Machining Center  
**NH450A, NH630B, NH800B**



# HBM

## Horizontal Boring Milling Machining Center

**BMP Series** High Accuracy Heavy Duty Boring Machine  
**BMP1416B**



# CNC LATHES

## CNC Turning Center

**NT Series** High Performance Mill/Turn Center  
**NT-2000Y/SY, NT-2500Y/SY**



**GT Series** High Performance Geo Turning Center  
**GT-200A/B/MA, GT-250A/B/MA/MB, GT-300A/B/LA/LB/MA/MB/LMA/LMB, GT-380A/B/LA/LB**



**TC Series** High Performance High Precision CNC Lathe  
**TC-16A/B/LA/LB/MA/MB/LMA/LMB, TC-26, TC-26L, TC-36, TC-36W, TC-46, TC-46M**



### INTEGRATION AND SOLUTIONS

Integrated Operation Control System **iOPERATION**

Spindle Thermal Compensation System **STC PLUS**

Remote Monitoring System **iDirect**

Automation Solutions



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