A World Leader of Horizontal Machining Centers

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NIIGATA MACHINE TECHNO

BOX in BOX®

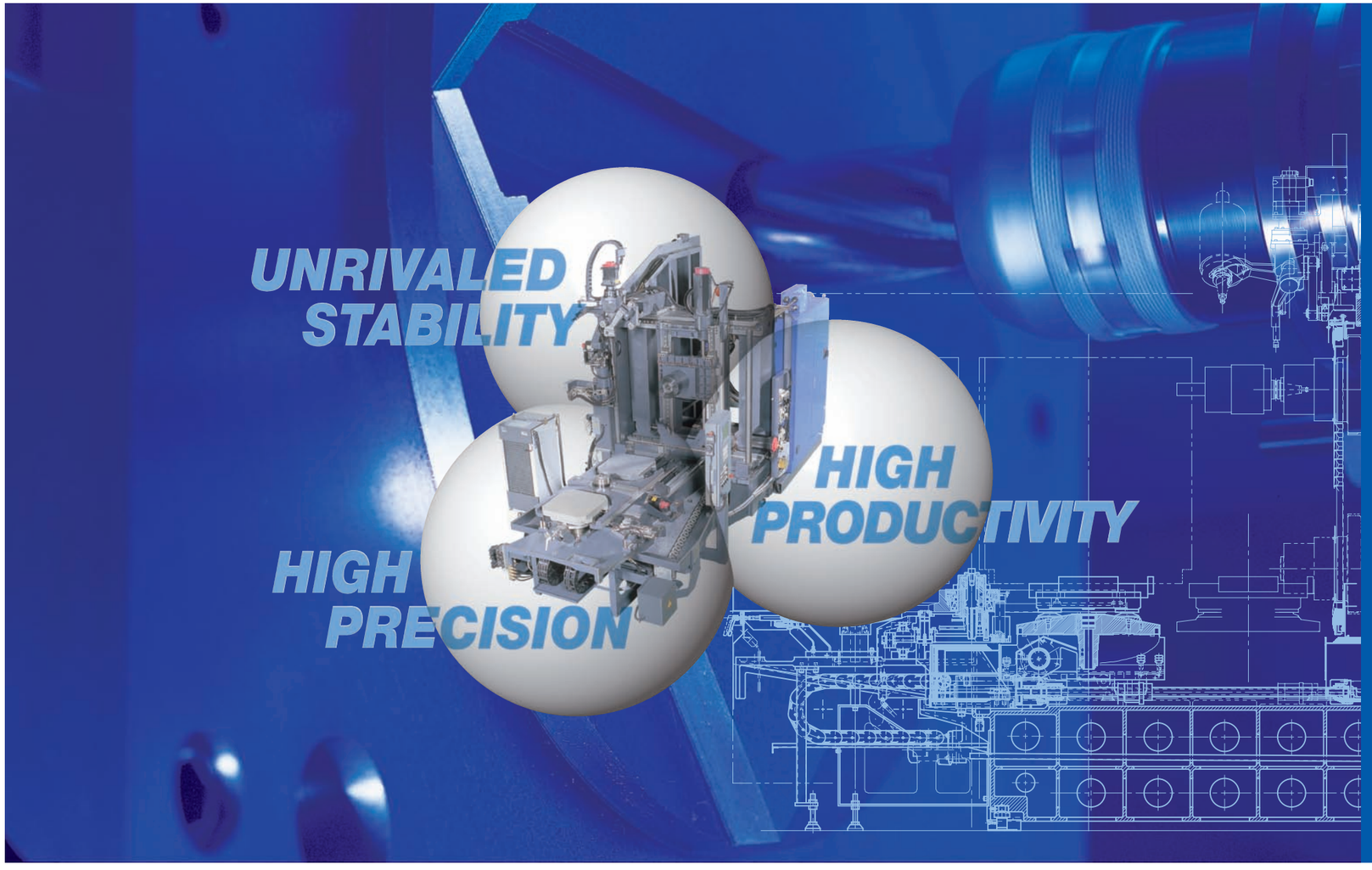
SPN01 SERIES

SPN501/701/901

UNRIVALED PERFORMANCE—HIGH PRODUCTION Horizontal Machining Centers

NIIGATA MACHINE TECHNO CO., LTD.
Niigata, Japan

NIIGATA, the originator of the "BOX in BOX®" design, Introduces the 3rd Generation SPN Series—the High Performance SPN501/SPN701/SPN901 Horizontal Machining Cente rs



Building on a century of machine tool design and innovation, Niigata is proud to be recognized as a leader and specialist in horizontal machining centers. Niigata's renowned "BOX in BOX®" SPN machines were introduced in 1993 and have earned the global respect as the VALUE leader.

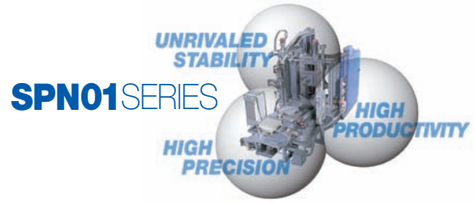
As a compliment to Niigata's intelligent design, there are a growing number of imitators.

However, those, who try to copy or mimic Niigata, can not match the functionality of the components which work in harmony in the Niigata SPN machines. While others try to "catch-up", Niigata continues to innovate in introducing the 3 model SPN-01 series.

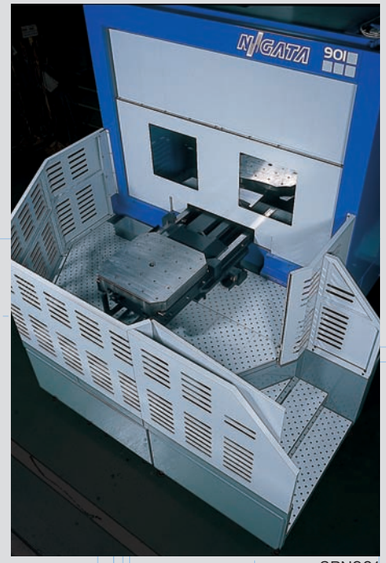
- **The casting design, the leading linear roller-guide way system, the unique reliable tool changer, and the spindle cutting capability are designed to allow you to achieve your goal of accurate parts produced in the shortest time.**
- **Dependable, repeatable, long-term stability is achieved in the stationary column design.**
- **The innovative casting design yields industry's most rigid " T-shaped" base – enabling the use of a 3-point contact with your floor, and more accurate machining.**
- **The most reliable tool changer, Niigata's Synchronous Swing Motion (SSM) ATC continues to give you years of fast dependable performance.**
- **8000, 12000, 15000 min^{-1}(rpm) spindles give you the choice to fit your application.**

CONTENTS

NIIGATA's ORIGINAL THINKING AND CONTINUOUS IM PROVEMENTS YIELD THE GREATEST VALUE IN HIGH SPEED HORIZO NTAL MACHINING CENTERS INTRODUCING THE LATEST "SPN" FAMILY




SPN901



SPN901

- Excellent Chip Evacuation
- Huge Work Enclosures
- Convenient Work Platform

	SPN501	SPN701	SPN901
TRAVEL X axis:	800 mm (31.5")	1000 mm (39.4")	1500 mm (59.1")
Y axis:	750 mm (29.5")	950 mm (37.4")	1300 mm (51.2")
Z axis:	750 mm (29.5")	850 mm (33.5")	1150 mm (45.3")
PALLET SIZE	500 × 500 mm (19.7" × 19.7")	630 × 630 mm (24.8" × 24.8")	800 × 800 mm (31.5" × 31.5")
Maximum Work Piece			
Swing diameter:	800 mm (31.5")	1100 mm (43.3")	1750 mm (68.9")
Height:	1000 mm (39.4")	1200 mm (47.2")	1400 mm (55.1")
Spindle Speed	8000 min^{-1} (rpm) ～15000 min^{-1} (rpm)		
Spindle Power	AC30 kW (40 HP) ～AC45 kW (60 HP)		
Rapid Traverse (X,Y,Z axis)	60 m/min (2362 ipm)	60 m/min (2362 ipm)	50 m/min (1968 ipm)

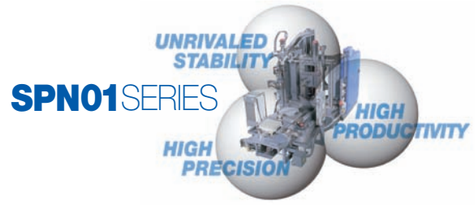
High Torque Spec. and High Power Spec. Spindle are available — See page 12.

⬆SPN501

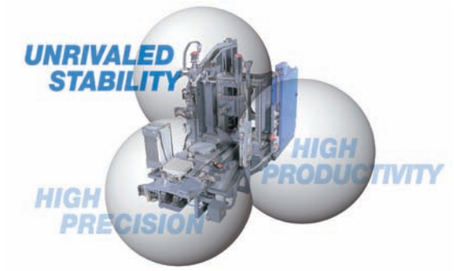
⬆SPN701

⬆SPN901

NIIGATA ORIGINATED THE "BOX in BOX®" MACHINE D ESIGN to PROVIDE HIGH-SPEED, OPTIMUM CUTTING PERFORMANCE AND LONG-TERM STABILITY. INTRODUCING THE SPN-01 SERIES—*the INNOVATION CONTINUES*—



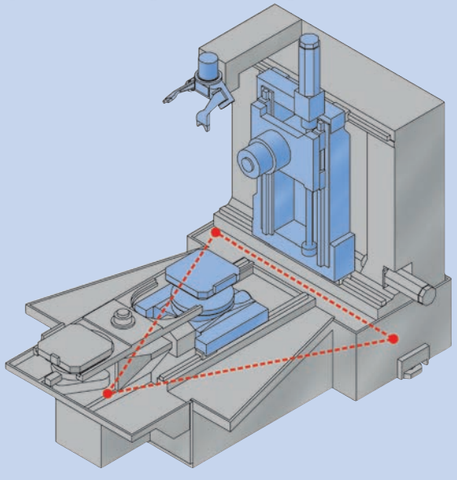
SPN501/701/901
UNRIVALED STABILITY

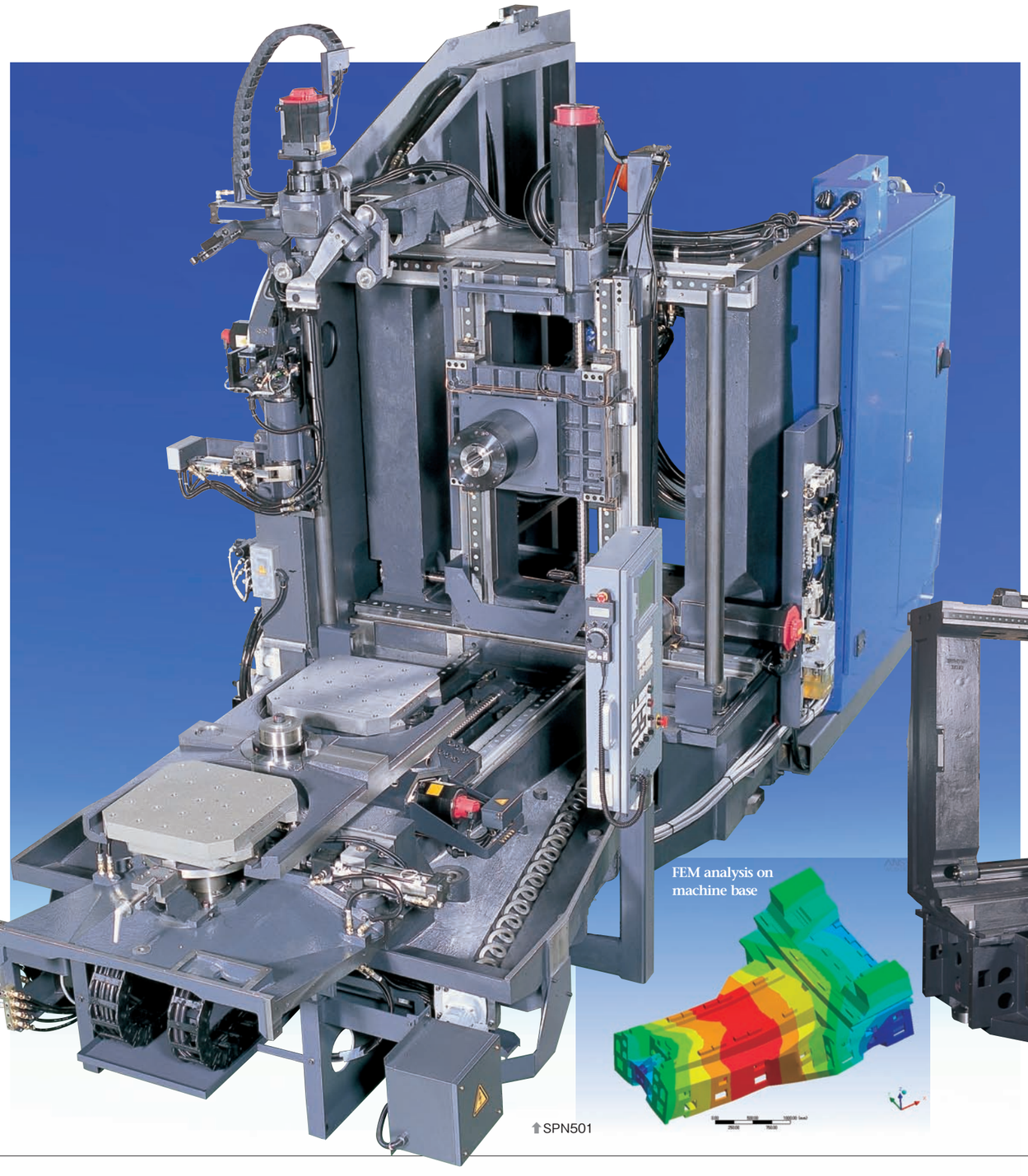


The innovative "SPN" design begins with the "BOX in BOX®" structure, originated by Niigata.

The stationary "one-piece" column is mounted on a rigid T-shaped "mono-cast" base. This is the heart of machine squareness, which is so critical in achieving accurate machining. Mount the spindle carrying saddle to the column and the goal of practical long-term high speed movement is realized.

3 points levelling with ultra rigid machine base



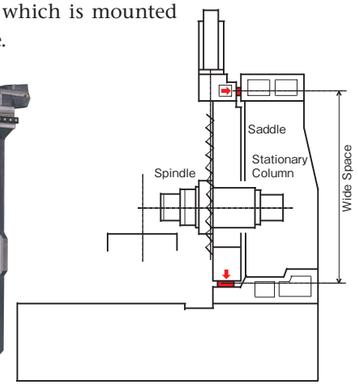


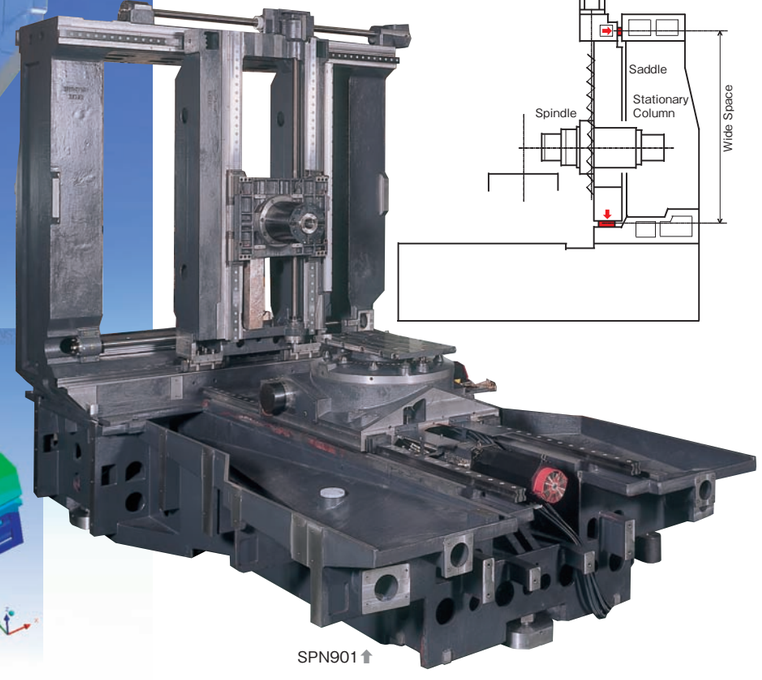
SPN501

FEM analysis on machine base

BOX in BOX®

- Rigidity: Less than few micron of deflection of the base and column under dynamic load maintains squareness and allows for a 3-point (base to floor) installation.
- The base rigidity is further increased by eliminating the" U" shaped cut-out found in some "center-trough" designs.
- The spindle is carried on a ductile iron saddle (1.5 times stiffer than cast iron), which is mounted on wide-spaced perpendicularly oriented X-axis ways.
- Reduced mass provides higher ACC/DEC rates and contributes to lower maintenance with longer life cycle.
- Axial thrust is always captured between the upper and lower X-ways, and no column" lean" when working in high" Y" positions (compared to traditional moving column designs).
- The center of the gravity of the mass of the spindle and the spindle saddle is positioned directly above the bottom X-way, which is mounted in the Z-X plane.

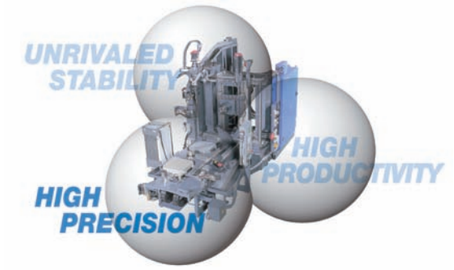




SPN901

SPN01 SERIES

SPN501/701/901 NIIGATA PRECISION



Niigata's" BOX in BOX®" design ensures long-term stability of machine accuracy

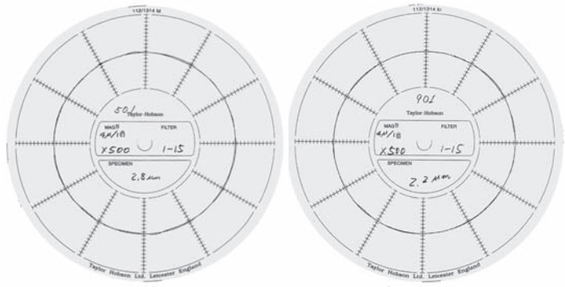
Here is the data to proof unrivaled stability of machine accuracy. It is basically no change of the machine accuracy after 3 years of the machine installation.

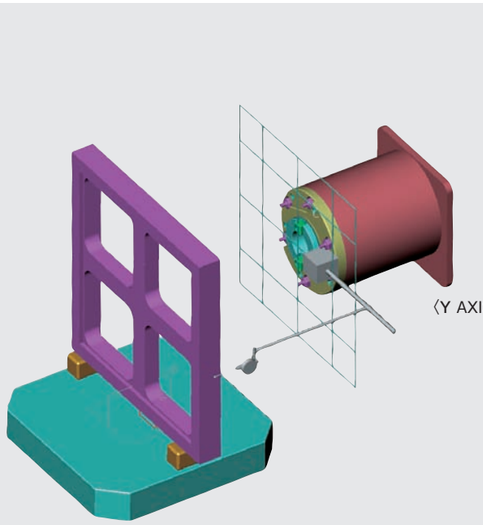
Exacting Accuracy (Accuracy of circular interpolation)

	SPN501	SPN901
Roundness (Tolerance)	10 μm (0.0004")	10 μm (0.0004")
Roundness (Actual record)	2.8 μm (0.00011")	2.2 μm (0.00009")

Cutting Data (SPN501 / 901)

Material····· A5052
Diameter ····· ϕ 218mm {8.58"}
Cutting tool····· ϕ 16mm {0.62"} end mill 4T Carbide

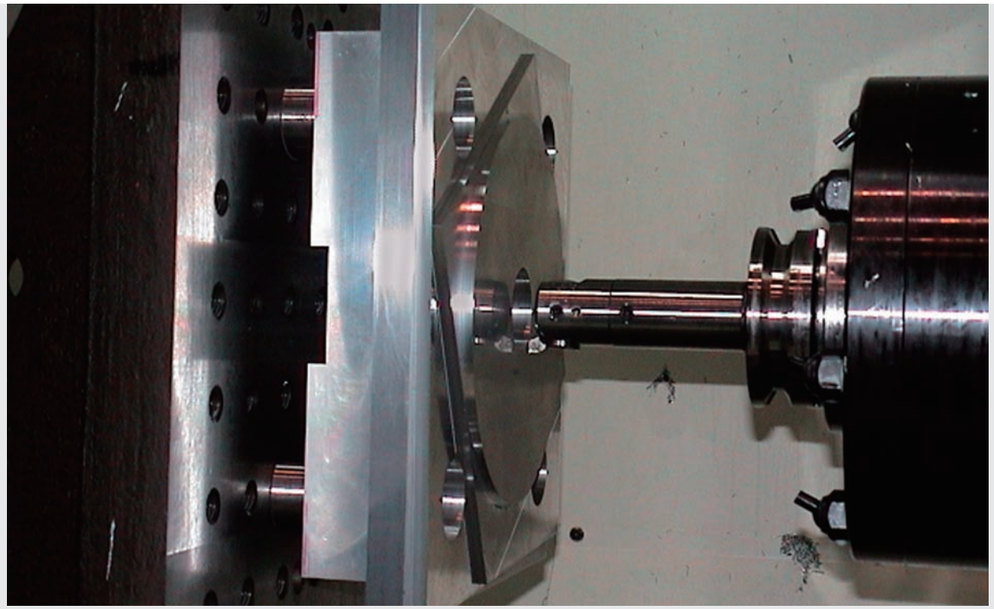




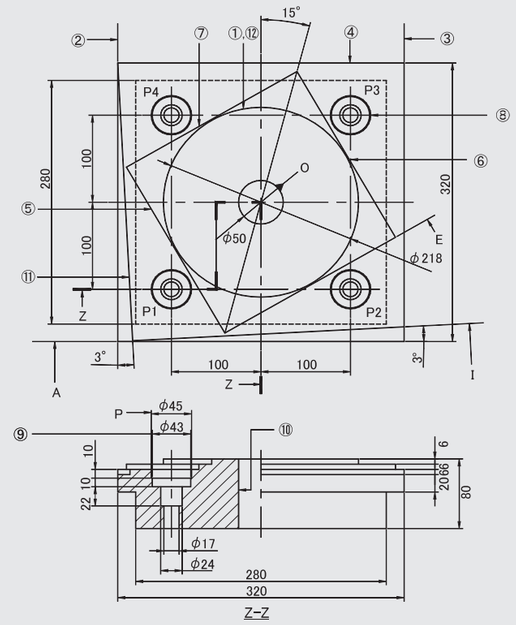
Installation → After 1.5 years → After 3 years

	(X-150)	(X-250)	(X-400)	(X-550)	(X-650)
(Y-130)	0→0→0	0→0→0	0→0→0	0→0→0	0→0→0
(Y-230)	0→0→-2	-1→0→-1	0→-1→-2	0→0→0	0→0→-2
(Y-380)	-1→0→-2	-2→-2→-2	0→-2→-2	0→-1→-2	-1→0→-3
(Y-530)	-2→-1→-3	-2→-2→-3	-2→-2→-2	0→-1→-2	-1→-1→-3
(Y-630)	-1→0→0	-2→-2→-2	-2→-2→0	0→0→0	0→0→-1

〈Y AXIS〉 (+) (−)
〈X AXIS〉 (+) (−)
UNIT:μm



Exacting Accuracy (Cutting data by SPN501/SPN901 with scale feedback system)



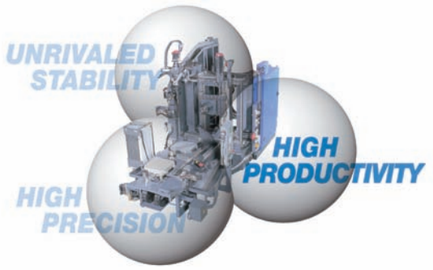
Cutting accuracy (μm)

	Items	SPN501	SPN901
❶	Roundness	2.8	2.2
❷	Squarrenss (A)	2	3
❸	Squarrenss (A)	2	2
❹	Parallelism (A)	1	1
❺	Squarrenss (E)	5	6
❻	Squarrenss (E)	1	1
❼	Parallelism (E)	1	7
❽-P1	Position error (O)	6	8
❽-P2	Position error (O)	6	6
❽-P3	Position error (O)	1	4
❽-P4	Position error (O)	7	0
❾-P1	Concentricity (❽-P1)	2	4
❾-P2	Concentricity (❽-P2)	1	1
❾-P3	Concentricity (❽-P3)	1	2
❾-P4	Concentricity (❽-P4)	1	2
❿	Cylindricity	1	3
⓫	Squarrenss (I)	5	0
⓬	Concentricity (O)	3	5

NIIGATA's INNOVATION LEADS TO HIGH SPEED, HIGH PRODUCTIVITY

SPN01 SERIES

SPN501/701/901 HIGH PRODUCTIVITY



Niigata's unique Synchronous Swing Motion (SSM) Auto tool changing system.·····❶

For high speed and weight the SSM has proven to be the most reliable tool exchange mechanism. It employs Fanuc servo technology to achieve ease of maintenance and operator friendliness.

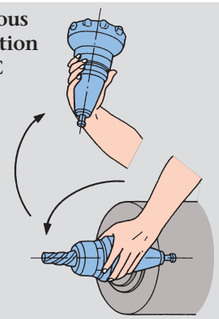
● ATC Time
(Exclude ATC shutter open/close time)

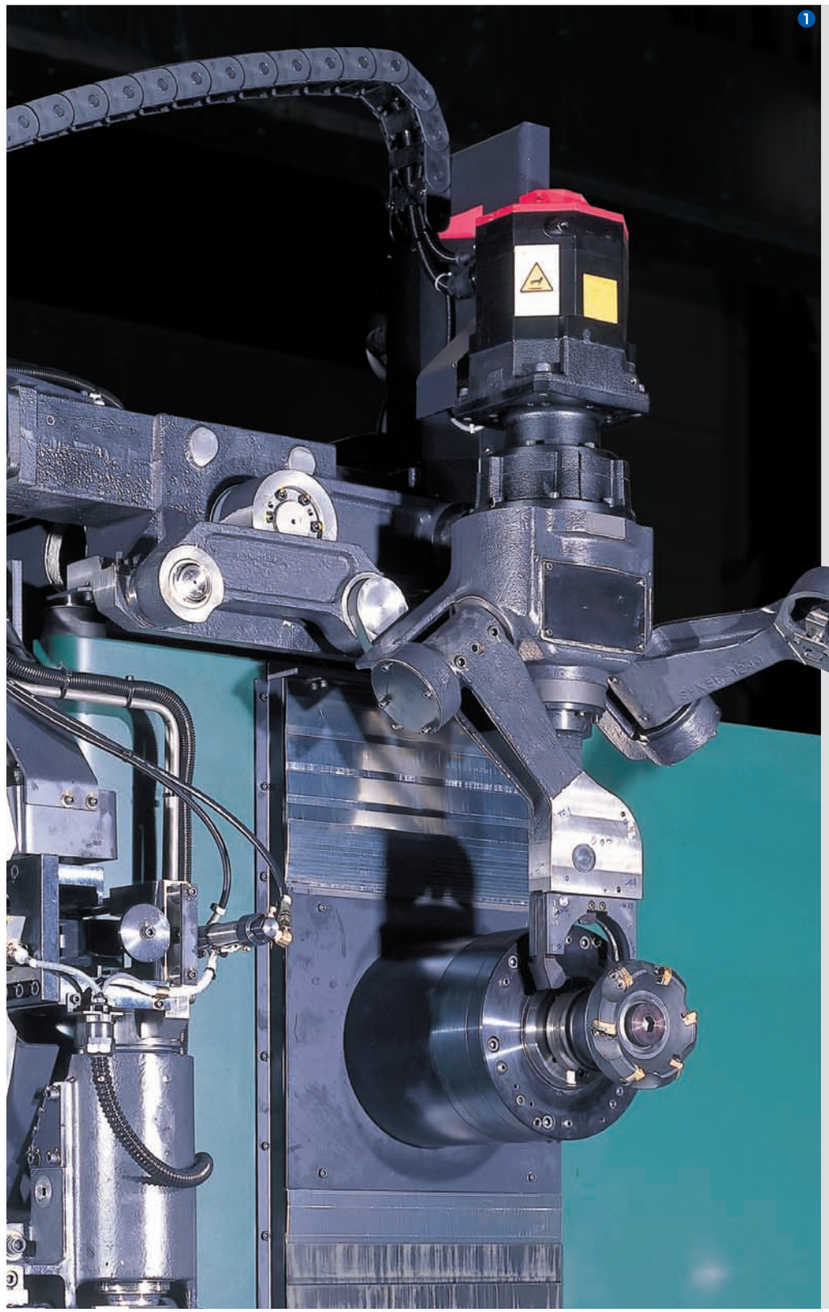
SPN501 (Tool weight 20kg {40lbs})
T to T···**1.4s** C to C···**3.8s**

SPN701 (Tool weight 20kg {40lbs})
T to T···**1.4s** C to C···**3.8s**

SPN901 (Tool weight 30kg {66lbs})
T to T···**2.7s** C to C···**5.8s**

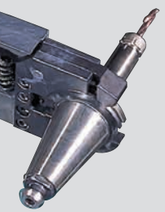
Synchronous Swing Motion (SSM) ATC





Shorter cycle time delivers high productivity

SPN501/SPN701
● Rapid traverse
60 m/min
(2362 ipm)

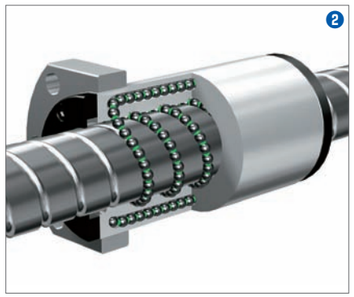


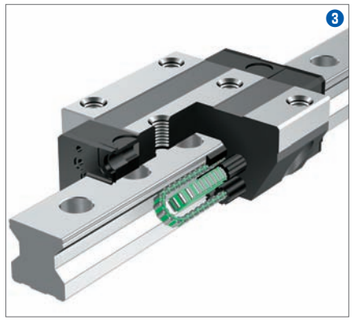
SPN901
● Rapid traverse
50 m/min
(1968 ipm)

■Self lubrication function···❷
Long duration lubrication designed into the ball nut and linear roller truck means lower operating cost and responsibility to the environment.

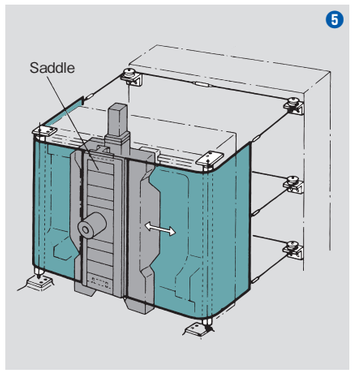
■Ultra rigid and high load type of roller guide way system
·····❸
To maximize rigidity and dampening, roller bearing guides are adopted on the X, Y and Z axes.
The combined engineering features, such as enhanced rigidity of the machine construction, wider span of the X and Y axes guide ways, and the roller guide way system meet rigorous production needs.
The roller bearings are guided with roller retainers resulting in no roller-to-roller contact and less friction.

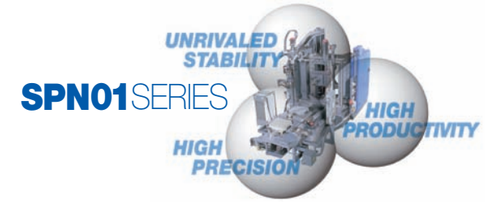
■Design details focuses on operator friendliness·····❹
The operator panel is positioned to the left side of operator door giving excellent accessibility and ease of operation.
The manual pulse generator has XYZ axis coordinate display by LCD as an option.

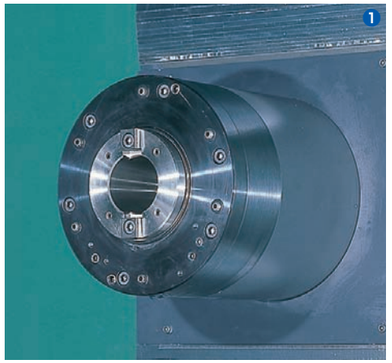




■Durable way covers for high speed positioning·····❺
It is simple, yet effective. The heat-resistant durable covers are inter-connected providing uniform movement with spindle- saddle.
•No collision parts. Fast and silent
•Durable and smooth movement
•Cover is one sheet, Minimizes coolant and/or swarf escape.







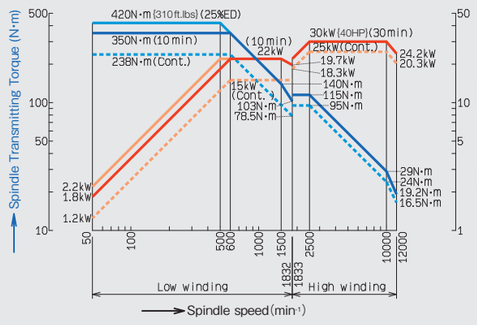
Variety of high performance spindles ❶

The spindle of performance is one of key evidence of the capability of the machine. The spindles provide Speed, Power, and Accuracy for full range of cutting conditions. 8000min-1(rpm), 12000min-1(rpm),15000min-1(rpm) / High Power Spec., and 8000min-1(rpm)/ High Torque Spec. are also available.

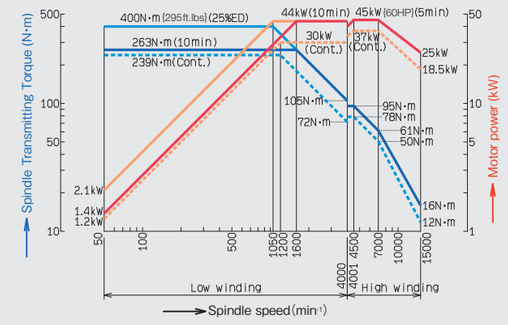
	❶12000min^{-1}(rpm) •Spindle Power 30kW {40HP} •Max.Torque 420N·m{310ft·lbs}	❷8000min^{-1}(rpm) •Spindle Power 30kW {40HP} •Max. Torque 600N·m{442ft·lbs}	❸15000min^{-1}(rpm) High Power Spec. •Spindle Power 45kW {60HP} •Max. Torque 400N·m{295ft·lbs}	❹8000min^{-1}(rpm) High Torque Spec. •Spindle Power 37kW {50HP} •Max. Torque 1009N·m{744ft·lbs}
SPN501	Standard	Option	Option	N/A
SPN701	Standard	Option	Option	Option
SPN901	N/A	Standard	Option	Option

SPINDLE SPEED AND TORQUE DIAGRAM

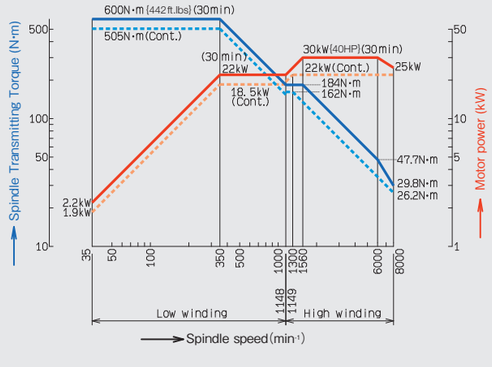
❶12000min^{-1} SPINDLE



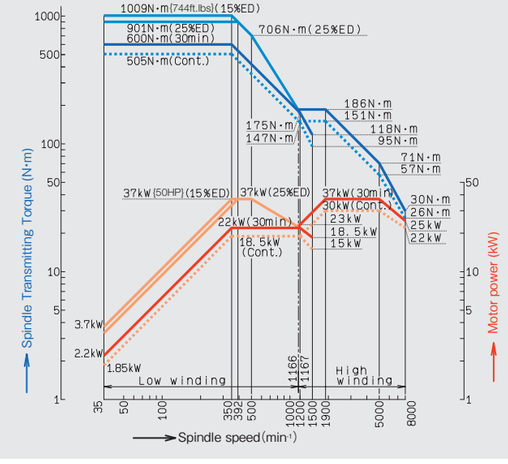
❸15000min^{-1} SPINDLE High Power Spec.



❷8000min^{-1} SPINDLE

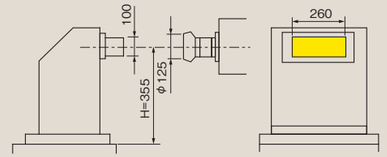


❹8000min^{-1} SPINDLE High Torque Spec.



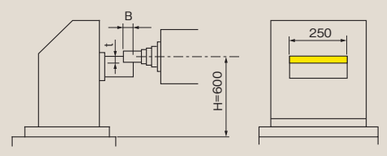
Example SPN01's Machining Performance

Milling Cutter—SPN501 Spindle 12000min^{-1} (rpm)



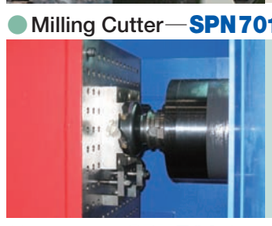
- Material: S45C •Tool: ϕ 125 × 6T
- Cutting volume: 630cm^3/min (38.4 in^3/min)
- Cutting depth: 5.5mm (0.21")
- Cutting width: 100mm (3.93")
- Feedrate: 1146mm/min (45.1 ipm)
- Spindle speed: 637min^{-1} (637rpm)
- Surface Speed: 250m/min (820 SFM)

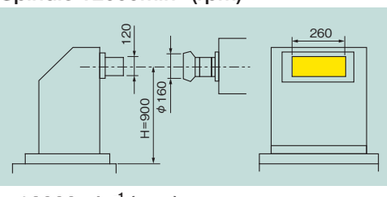
End milling—SPN501 Spindle 12000min^{-1} (rpm)



- Material: S45C •Tool: ϕ 50 × 2T
- Cutting volume: 343.8cm^3/min (21.0 in^3/min)
- Cutting depth: 15mm (0.59")
- Cutting width: 40mm (1.57")
- Feedrate: 573mm/min (22.8 ipm)
- Spindle speed: 955min^{-1} (955 rpm)
- Surface Speed: 150m/min (492 SFM)

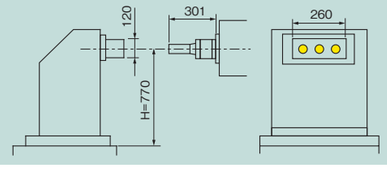
Milling Cutter—SPN701 Spindle 12000min^{-1} (rpm)





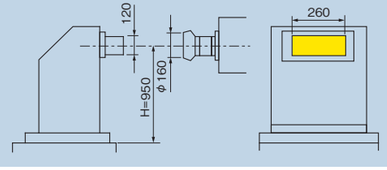
- Material: S45C •Tool: ϕ 160 × 8T
- Cutting volume: 493cm^3/min (29.9 in^3/min)
- Cutting depth: 6mm (0.24")
- Cutting width: 120mm (4.72")
- Feedrate: 686mm/min (27.0 ipm)
- Spindle speed: 400min^{-1} (400 rpm)
- Surface Speed: 200m/min (656 SFM)

Drilling—SPN701 Spindle 12000min^{-1} (rpm)



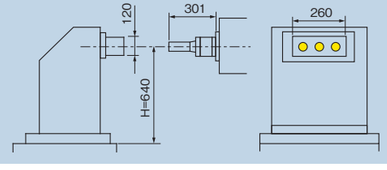
- Material: S45C
- Tool: ϕ 60 insert style drill
- Spindle load: 66%
- Zaxis load: 77%
- Spindle speed: 795min^{-1} (795 rpm)
- Feedrate: 95mm/min (3.7 ipm)
- Surface Speed: 150m/min (492 SFM)

Milling Cutter—SPN901 Spindle 8000min^{-1} (rpm)



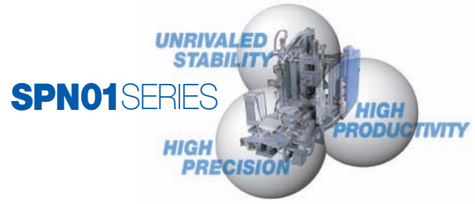
- Material: S45C •Tool: ϕ 160 × 8T
- Cutting volume: 700cm^3/min (42.7 in^3/min)
- Cutting depth: 6mm (0.24")
- Cutting width: 120mm (4.72")
- Feedrate: 980mm/min (38.6 ipm)
- Spindle speed: 350min^{-1} (350 rpm)
- Surface Speed: 176m/min (577 SFM)

Drilling—SPN901 Spindle 8000min^{-1} (rpm)



- Material: S45C
- Tool: ϕ 60 insert style drill
- Spindle load: 60%
- Zaxis load: 30%
- Spindle speed: 795min^{-1} (795 rpm)
- Feedrate: 95mm/min (3.7 ipm)
- Surface Speed: 150m/min (492 SFM)

WIDE RANGE OF OPTIONS TO ANSWER YOUR INDIVIDUAL MACHINING REQUIREMENTS



STANDARD EQUIPMENT

- Automatic Tool Changer With 60ATC Tool Capacity
- 50-12000min^{-1} (rpm) Direct Drive Spindle (SPN501 / SPN701)
- 35-8000min^{-1} (rpm) Direct Drive Spindle (SPN901)
- Spindle Cooling Unit
- One Degree Indexing Table
- Direct Turn Type Twin Pallet Change System With Idle Self Rotation (SPN501 / SPN701)
- Twin Pallet Change System With Walk Around Platform (SPN901)
- Chip Augers Built into the Bed
- Flood Coolant System
- Full Enclosure-Type Splash and Chip Guarding System
- Work Completion and Emergency Lamp
- Fanuc CNC System
- 10.4" Color LCD
- Rigid Tapping
- Spindle Load/Speed Meter display on CNC Screen
- Self Diagnostics Function
- Automatic Power-Off Device

OPTIONAL FEATURES

AXIS FEEDBACK SYSTEM
- Scale Feed back System on XYZ Axes (Optical Scale Type)
- Scale Feed back System on B axis (NC table)

ATC MAGAZINE(Field Expandable)
- 118 Tool Magazine (60×2) (SPN701/ SPN901 only)
- Matrix Style ATC System (126 / 178 / 230)

TABLES
- 0.001°(NC Table)/4th Axis Continuous
- 5 Axis Application (Table on Table)

PALLET and PALLET CHANGER SYSTEM
- Carousel Type Multiple Pallet Changer 6/8/10/12 APC (only 6 and 8 APC for SPN901)
- Linear Pallet Magazine System with Niigata ICC System Controller
- Additional Pallet
- T-slotted pallet (Tapped Hole pattern with edge locator is Standard / Restriction of Max Load on Pallet may apply)

COOLANT SYSTEM
- Spindle Center Through Coolant
- Spindle Flange Through Coolant
- Overhead Shower Coolant System
- Shower Coolant and Airblow Function
- Work piece Washing Gun
- Coolant Low Level Sensing Device

CHIP REMOVAL
- Hinge Type Lift-Up External Conveyor
- Lift-Up External Conveyor with Filtration System
- Chip Bucket with Caster and Handles

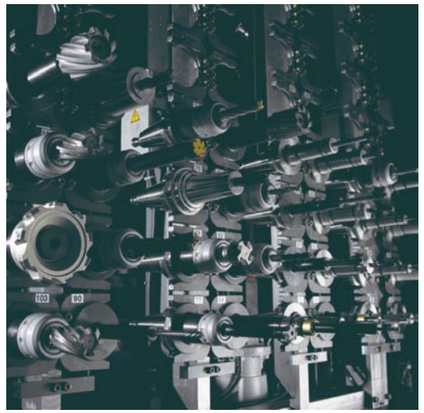
MONITORING FUNCTION
- Advanced Unmanned Monitoring System / NIIGATA MONITOR ACE
- Spindle Probe
- Table Probe
- Tool Breakage Detector LS-Z Type
- 4 Face Part Program Control Function

SPINDLE
- BIG PLUS Spindle (only for 12000rpm and 8000rpm)
- 15000min^{-1} (rpm) 45kW (60HP) Spindle
- 8000min^{-1} (rpm) 30kW (40HP) High Torque Spindle (SPN501 and SPN701 only)

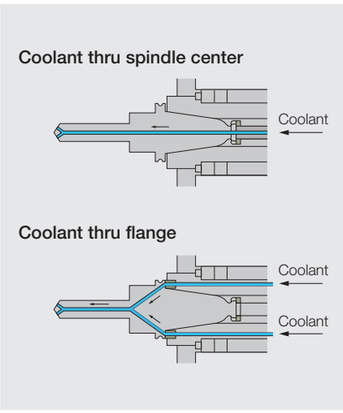
Lift-Up External Conveyor with Filtration System (SPN901)

OPTIONAL FEATURES

MATRIX TYPE AUTOMATIC TOOL CHANGE SYSTEM

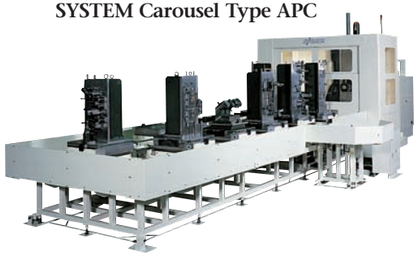


HIGH PRESSURE TYPE COOLANT THROUGH SPINDLE SYSTEM



LINEAR PALLET MAGAZINE SYSTEM WITH NIIGATA SYSTEM CONTROLLER

MULTIPLE PALLET CHANGE SYSTEM Carousel Type APC

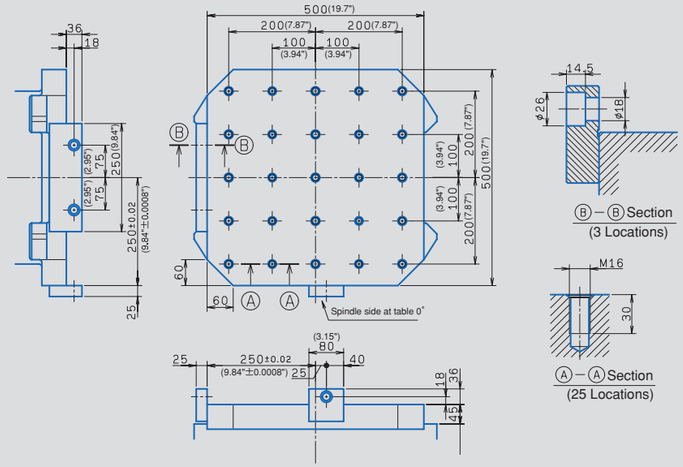


ADVANCED UNMANNED MONITORING SYSTEM NIIGATA MONITOR ACE (NM24 Generation II)

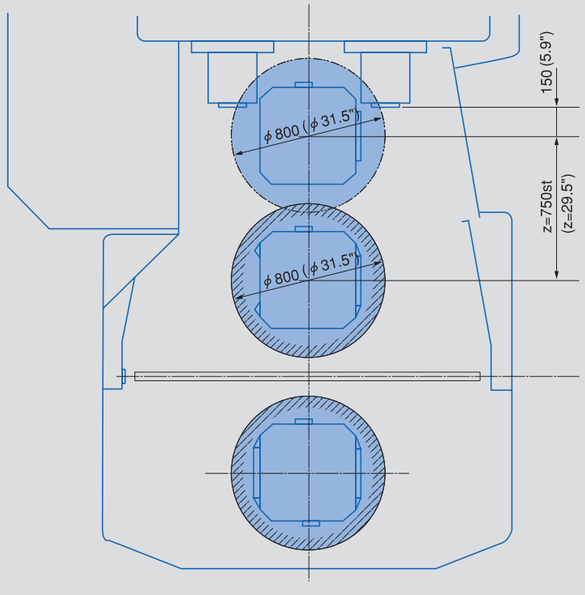
KEY FEATURES

- Display on machine operational screen:
All main features shown on machine operational screen (Fanuc CNC control)
- Cutting monitor–Max Spindle load monitor / Adaptive Control / Axis load monitor / Feed rate monitor:
Set the reference data of spindle load / Axis load and monitor the actual data during the machine run to minimize cutting Issues as well as machining of defective parts.
- Tool Life Monitor / Spare Tool Function:
Set life time value on each tool and monitor the actual time used. The alarm occurs when the time of use reaches the set value. Automatic change of the tool to alternative tool is available when spare tool is ready.
- Automatic Continuous Machine Run:
Automatically proceed to the next work piece after the monitoring system detects some alarm condition on current process.
- Tool Number Conversion:
Eight (8) digits tool number is available as a standard function.

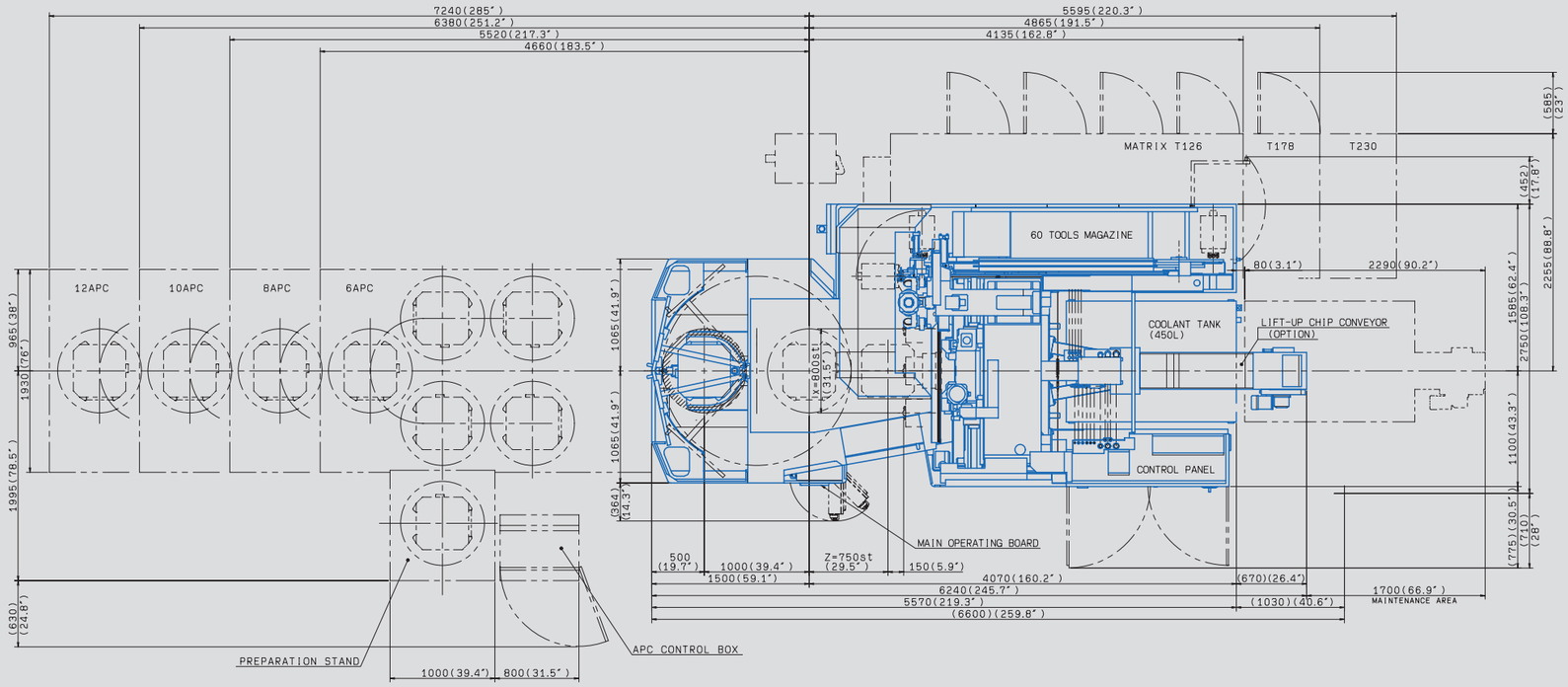
SPN501 Standard Pallet Top Surface

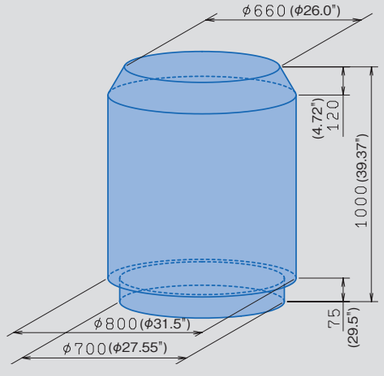


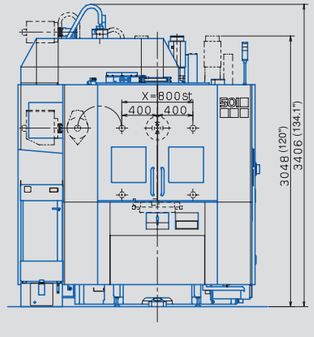
SPN501 Maximum work piece size

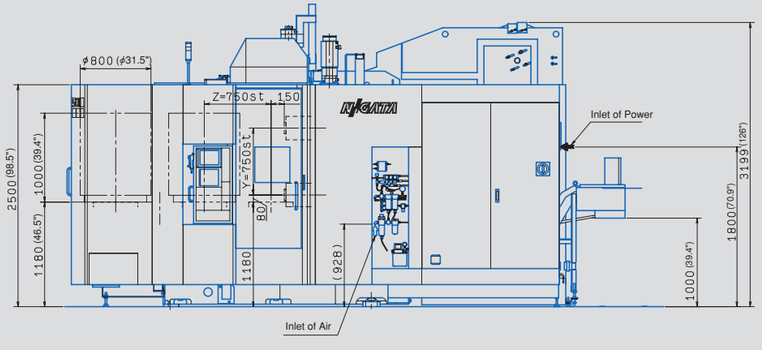


SPN501 General View

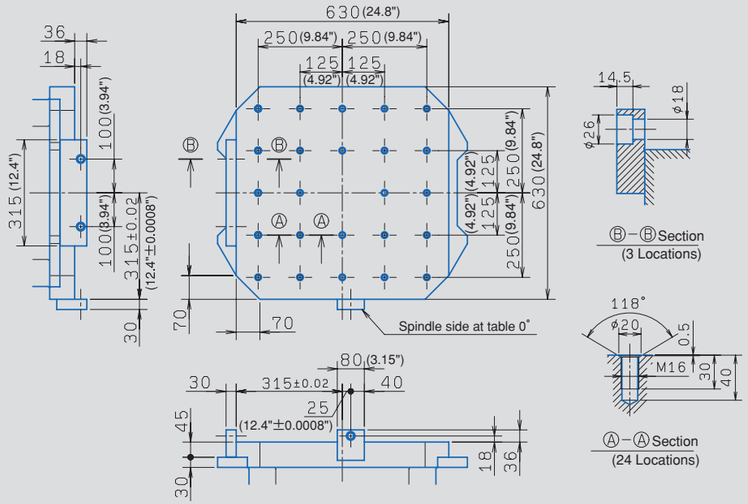




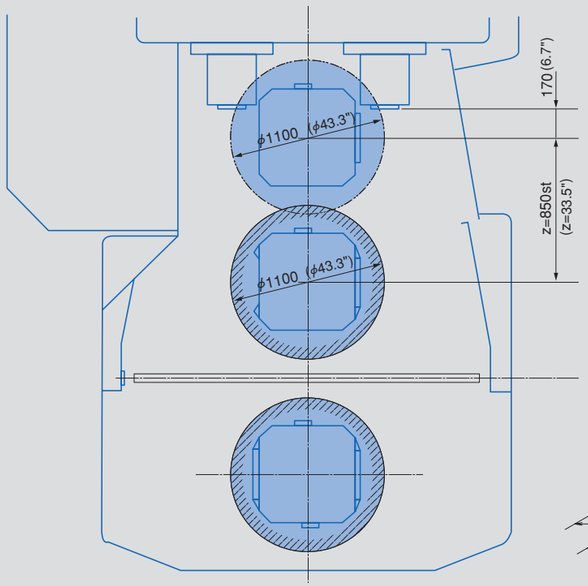


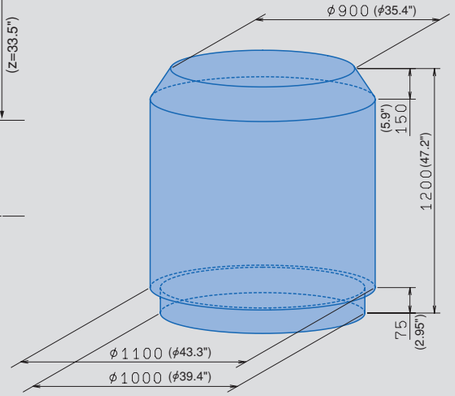


SPN701 Standard Pallet Top Surface

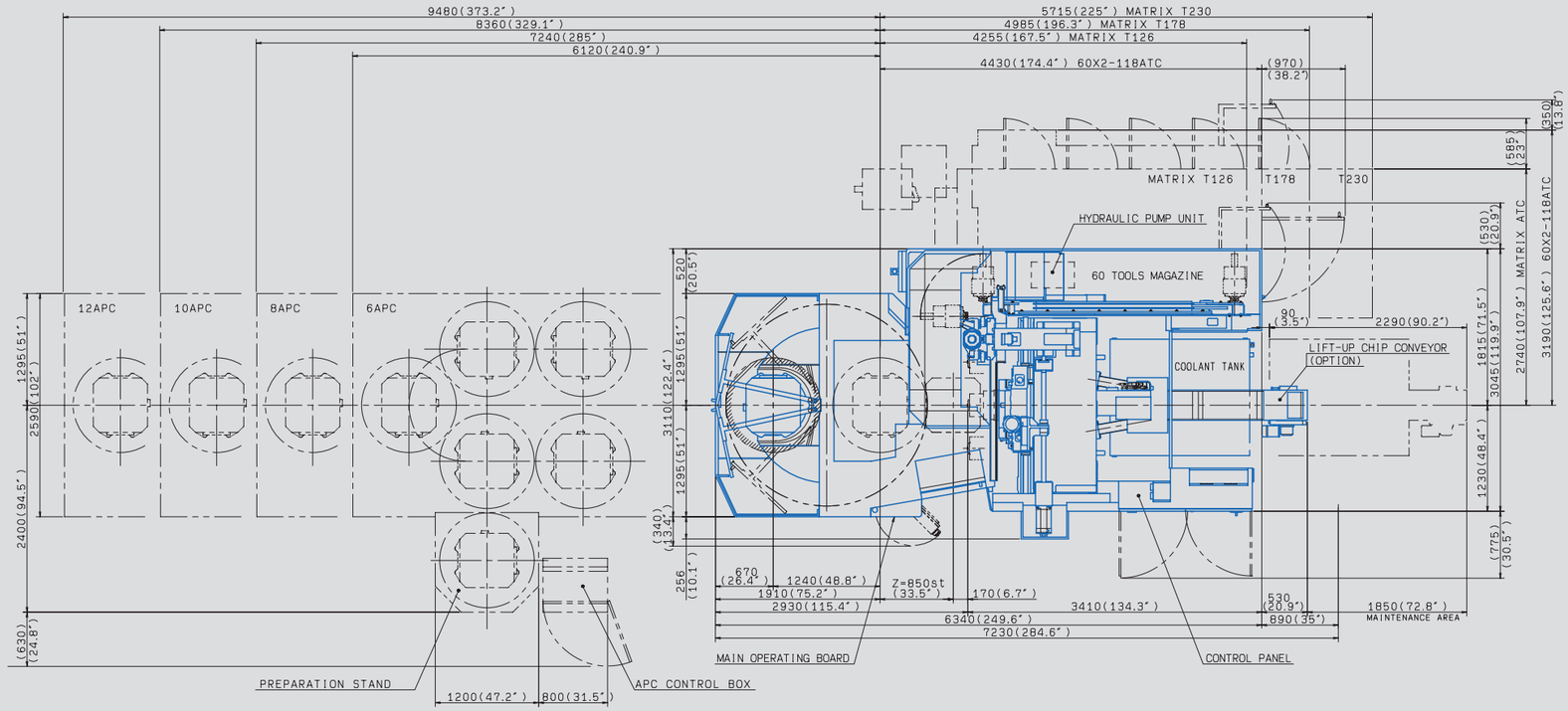


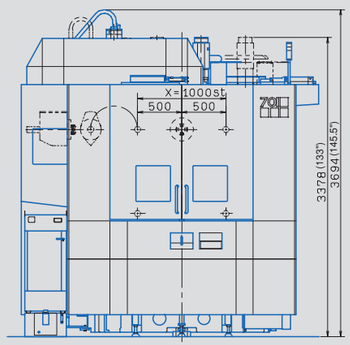
SPN701 Maximum work piece size

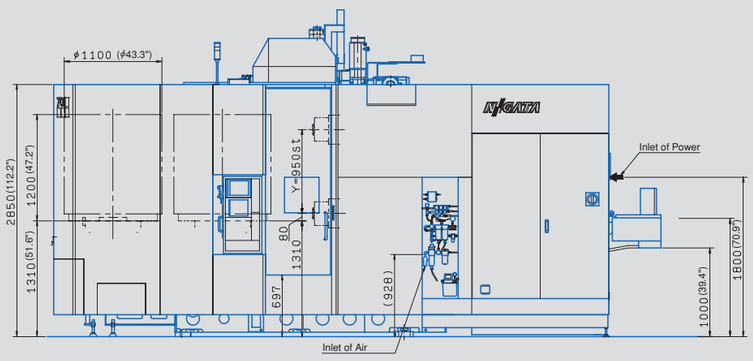




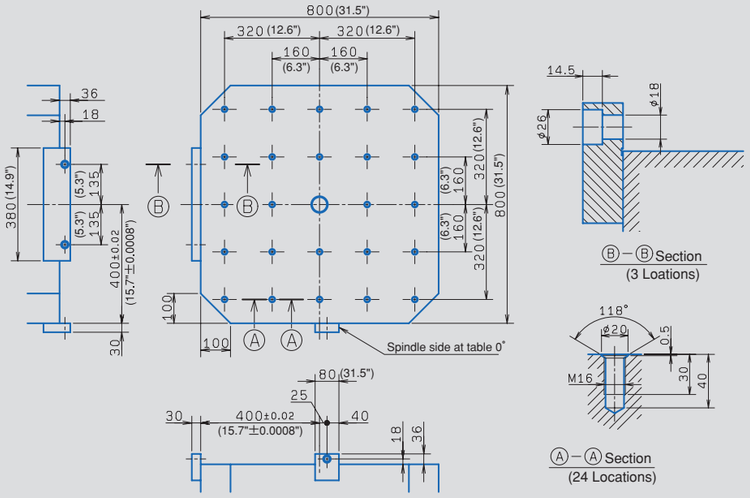
SPN701 General View



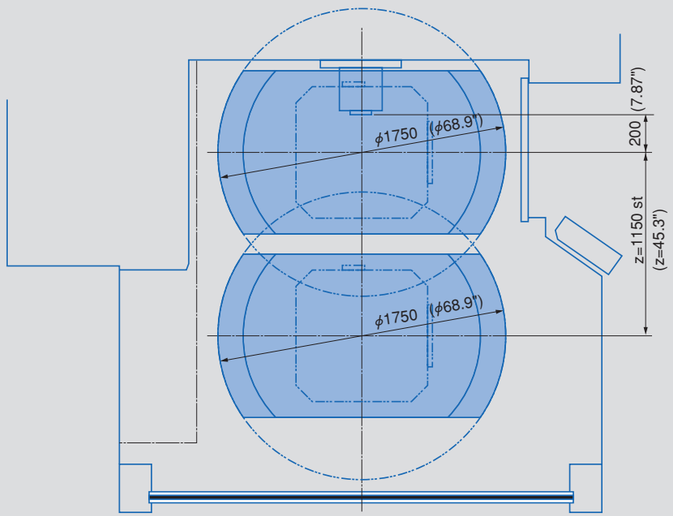


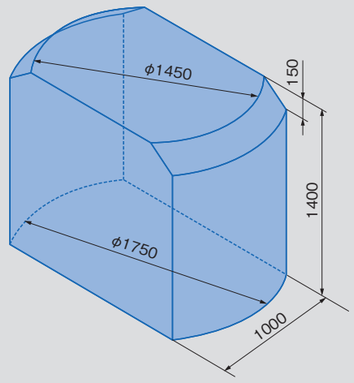


SPN901 Standard Pallet Top Surface

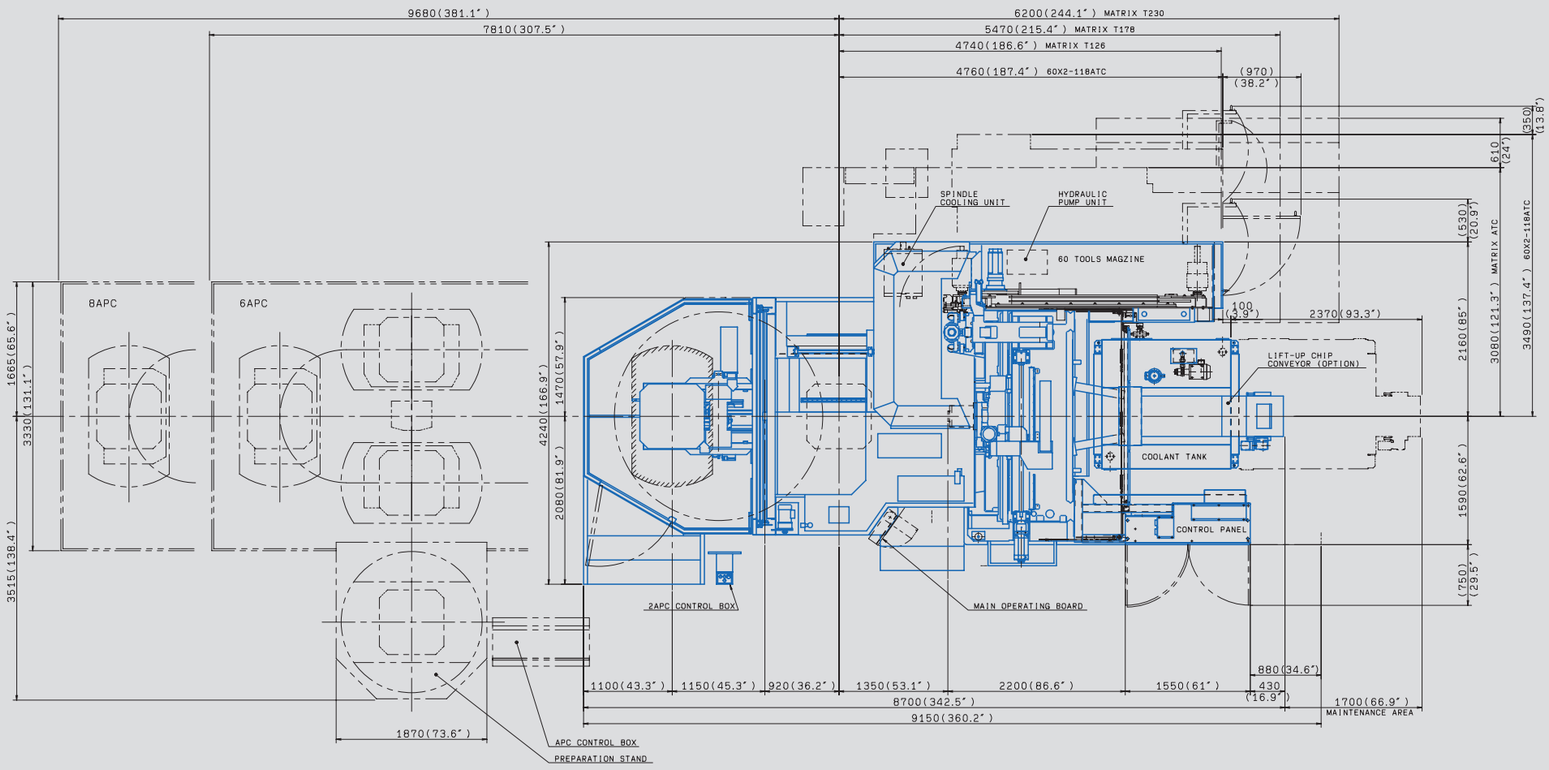


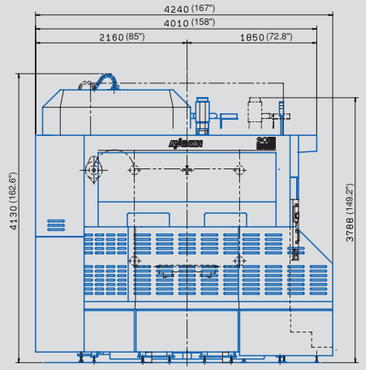
SPN901 Maximum work piece size

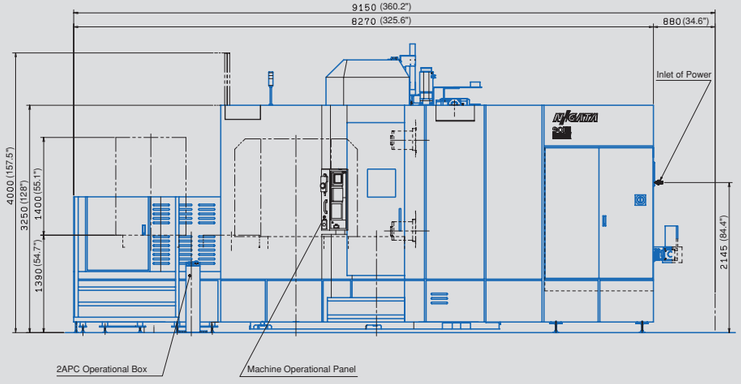




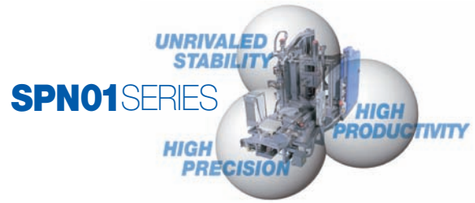
SPN901 General View







SPN501/701/901 — MACHINE SPECIFICATIONS



	ITEM	SPN501		SPN701		SPN901	
		Metric	Inch	Metric	Inch	Metric	Inch
TRAVEL	X axis travel (saddle side to side)	800 mm	31.5 "	1000 mm	39.4 "	1500 mm	59.1 "
&	Y axis travel (spindle head up and down)	750 mm	29.5 "	950 mm	37.4 "	1300 mm	51.2 "
WORK CAPACITY	Z axis travel (table front and rear)	750 mm	29.5 "	850 mm	33.5 "	1150 mm	45.3 "
	Spindle center line to pallet surface	80 ~ 830	3.15 ~ 32.7 "	80 ~ 1030 mm	3.15 ~ 40.6 "	80 ~ 1380 mm	3.15 ~ 54.3 "
	Spindle nose to table center line	150 ~ 900	5.9 ~ 35.4 "	170 ~ 1020 mm	6.7 ~ 40.2 "	200 ~ 1350 mm	7.87 ~ 53.15 "
TABLE	Table working surface	500 × 500 mm	19.7 × 19.7 "	630 × 630 mm	24.8 × 24.8 "	800 × 800 mm	31.5 × 31.5 "
	Table increments	1° [0.001°]	1° [0.001°]	1° [0.001°]	1° [0.001°]	1° [0.001°]	1° [0.001°]
	Maximum mass on pallet	600 kg	1320 lbs	1200 kg	2640 lbs	2000 kg [2500 kg]	4400 lbs [5500 lbs]
SPINDLE	Spindle drive motor	AC 30 / 25 Kw	AC 40 / 34 HP	AC 30 / 25 Kw	AC 40 / 34 HP	AC 30 / 22 Kw	AC 40 / 29.5 HP
	Spindle speeds	12000 min^{-1}	12000 rpm	12000 min^{-1}	12000 rpm	8000 min^{-1}	8000 rpm
	Spindle max. torque	420 N·m	310 ft.lbs	420 N·m	310 ft.lbs	600 N·m	443 ft.lbs
	Spindle taper	No.50	No.50	No.50	No.50	No.50	No.50
FEEDRATE	Rapid traverse X axis	60 m/min	2362 ipm	60 m/min	2362 ipm	50 m/min	1968 ipm
	Y axis	60 m/min	2362 ipm	60 m/min	2362 ipm	50 m/min	1968 ipm
	Z axis	60 m/min	2362 ipm	60 m/min	2362 ipm	50 m/min	1968 ipm
	Cutting X - Y - Z	1 ~ 40000 mm/min	0.04 ~ 1575 ipm	1 ~ 40000 mm/min	0.04 ~ 1575 ipm	1 ~ 40000 mm/min	0.04 ~ 1575 ipm
	Table index speed / 1° table	25 min^{-1}	25 rpm	20 min^{-1}	20 rpm	12 min^{-1}	12 rpm
	NC table	25 min^{-1}	25 rpm	20 min^{-1}	20 rpm	11.1 min^{-1}	11.1 rpm
AUTOMATIC	Tool magazine capacity	60 [126/178/230]	60 [126/178/230]	60 [126/178/230]	60 [126/178/230]	60 [126/178/230]	60 [126/178/230]
TOOL CHANGER				[118]	[118]	[118]	[118]
(ATC)	Tool selection	Short cut random	Short cut random	Short cut random	Short cut random	Short cut random	Short cut random
	Tool shank	BT50	CT50	BT50	CT50	BT50	CT50
	Maximum tool length	450 mm	17.7 "	550 mm	21.6 "	600 mm	23.6 "
	Maximum milling cutter dia.	130 mm	5.1 "	130 mm	5.1 "	130 mm	5.1 "
	Ditto adjacent pockets empty	260 mm	10.2 "	260 mm	10.2 "	260 mm	10.2 "
	Maximum tool mass (weight)	20 kg	44 lbs	20 kg [30 kg]	44 lbs [66 lbs]	30 kg	66 lbs
	Tool change time (tool to tool)	1.4 s	1.4 sec.	1.4 s	1.4 sec.	2.7 s	2.7 sec.
AUTOMATIC	Type	Direct Turn	Direct Turn	Direct Turn	Direct Turn	Rotary shuttle	Rotary shuttle
PALLET CHANGER(APC)	Number of pallets	2	2	2	2	2	2
ACCURACY	Positioning / full stroke X - Y - Z	± 0.0025 mm	± 0.00010 "	± 0.0025 mm	± 0.00010 "	± 0.004 mm	± 0.00016 "
	Ditto with scales X - Y - Z	± 0.0020 mm	± 0.00008 "	± 0.0020 mm	± 0.00008 "	± 0.003 mm	± 0.00012 "
	Repeatability X - Y - Z	± 0.0015 mm	± 0.00006 "	± 0.0015 mm	± 0.00006 "	± 0.0015 mm	± 0.00006 "
	Ditto with scales X - Y - Z	± 0.0010 mm	± 0.00004 "	± 0.0010 mm	± 0.00004 "	± 0.0010 mm	± 0.00004 "
GENERAL	Machine weight approx.	16000 kg	35200 lbs	20500 kg	45100 lbs	28000 kg	61600 lbs
	Machine space W / D	2685 / 5570 mm	105.7 / 219.3 "	3366 / 7210 mm	132.5 / 283.9 "	4240 / 8270 mm	167 / 326 "
	Ditto H	3406 mm	134.1 "	3694 mm	145.4 "	4130 mm	162.6 "
	Floor to table surface	1180 mm	46.5 "	1310 mm	51.6 "	1370 mm	53.9 "
	Power	83 kVA	83 kVA	92kVA	92kVA	90kVA	90kVA
	Control	Fanuc	Fanuc	Fanuc	Fanuc	Fanuc	Fanuc

NOTE: [ ] means optional specifications