



# PUMA 2600SYB II

*Product Quote*

**DN Solutions**

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**DN SOLUTIONS**

# PUMA 2600SYB II

## High Performance Sub Spindle Y-Axis Mill-Drill Turning Center

Puma 2600SYB II turning centers are designed for long-term high accuracy and superior surface finishes. High speed turret indexing and ultra-fast rapid traverse rates minimize non-cutting time. Mill-drill capability and Y-axis with a full C-axis sub spindle greatly reduce the need for secondary operations, eliminating additional set-up and handling costs. Classic manufacturing methods and ultra-rigid construction are combined with advanced technological features to provide exceptional value.



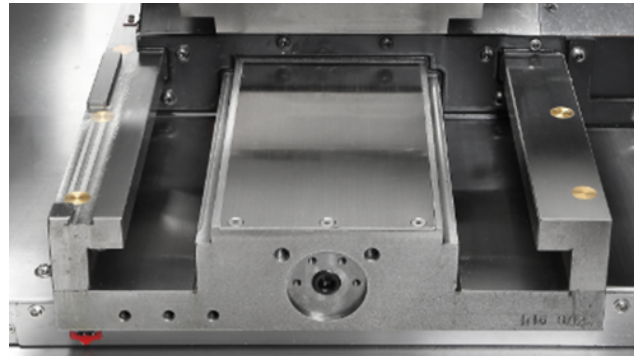
# CONSTRUCTION

## • BED

The PUMA 2600SYB II bed is a one piece Meehanite® casting that inhibits thermal deformation and twisting. The Meehanite process produces a fine grain casting with excellent vibration dampening characteristics minimizing cutting vibration and greatly extending tool life. The bed guideways are on a 30-degree angle to maintain a minimal and constant distance from tool tip to guideway. This ensures maximum rigidity and virtually no deformation under heavy loads. The slant angle ensures chips and coolant fall unobstructed into the chip pan reducing heat transfer and retention. The natural design advantages of a slant bed are further optimized to reduce the proximity of the chucks and turret to the front of the PUMA 2600SYB II for a superior ergonomic design. The ease with which the operator is able to inspect, load and unload parts or change tools minimizes fatigue and increases productivity.

## • GUIDEWAYS

All NTN sliding bearing guideways are wide wrap-around rectangular type for unsurpassed long-term rigidity and accuracy. The guideways are widely spaced to ensure stability. The NTN sliding bearing provides a low friction surface which virtually eliminates guideway wear. It also provides vibration dampening for better surface finishes. Friction rate decreases as load increases. The bed guideways are protected by a one-piece heavy gauge stainless steel cover.

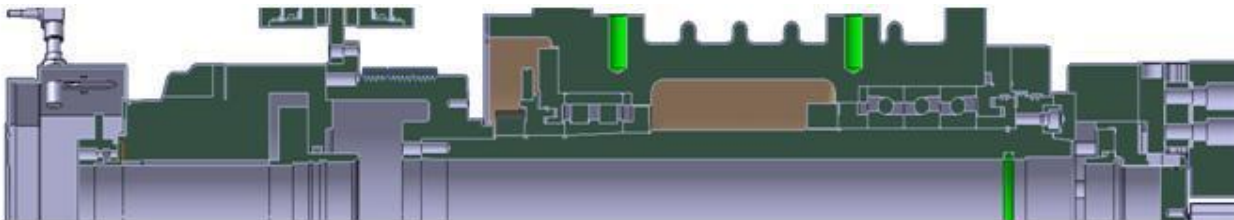


## • BALL SCREWS AND AXIS DRIVES

Each axis is driven by a large diameter high precision ball screws specifically selected to achieve an outstanding combination of high accuracy, high rapid traverse rates and high feed thrust. Both ball screws are supported on each end. The X & Z axis ball screws are pre-tensioned for accurate positioning and thermal stability. The thrust bearings are precision class P4 (PN7A) angular contact type. Ball screws are centered between the guideways and are directly mounted to the AC servo motors without intermediate gears or belts to minimize backlash. The Z axis servo motor is mounted on the headstock end of the ball screw. Each axis has an electric torque limiter to protect the ball screw and minimize damage in case of a crash. Upon impact, the electric torque limiter senses the abnormal load and immediately reverses the servomotor and stops the axis movement. The electric torque limiter can be quickly reset, minimizing downtime.

## • MAIN SPINDLE AND HEADSTOCK

The robust headstock and sub spindle castings are mounted on the same ground surface to maintain perfect alignment and center height regardless of the bed temperature. The headstock has a refrigerated temperature control system to minimize thermal growth. The heavy duty spindle is supported by triple row angular ball bearing design in the front and a double row cylindrical roller bearing in the rear. This design provides reduced heat and increased accuracy while ensuring the highest rigidity for heavy loads and high surface finishes.



All spindle bearings are precision class P4 AFBMA-B7 and are permanently grease lubricated. The precision bearings and perfectly balanced spindle allow a high maximum RPM.

- **MAIN SPINDLE MOTOR**

A large spindle motor provides power for heavy stock removal, reducing the number of roughing passes required. The powerful AC motor provides fast spindle acceleration. The spindle motor is flange mounted on the side of the bed casting, assuring perfect alignment with the headstock. Power is delivered to the 2,800 rpm spindle by drive belts for smooth vibration-less operation. The gear-less spindle drive design requires no maintenance and eliminates the possibility of vibration to ensure the highest surface finishes. The motor is a spindle/servo type. Low end torque is 828 ft-lb and full horsepower is available from 187 rpm.

- **SUB SPINDLE**

The sub spindle enables the complete machining of parts in one setup. The full C-axis design allows milling, drilling, and tapping on the back side of parts. The sub spindle body is accurately positioned by a ball screw and servo motor. The PUMA 2600SYB II has a 7.5 kW (10 hp spindle motor flange mounted to the rear of the sub spindle assembly. Drive belts deliver power to the 4,500 rpm spindle for smooth vibration-less operation. Maximum spindle torque is 85 Nm (63 ft-lbs). The spindle is supported by angular contact bearings in the front and cylindrical roller bearings in the rear. The sub spindle can be synchronized with the main spindle at speeds up to 4,000 rpm for "on the fly" part transfer. Parts can be automatically ejected into the standard parts catcher. The maximum chuck size is 210 mm (8.0")

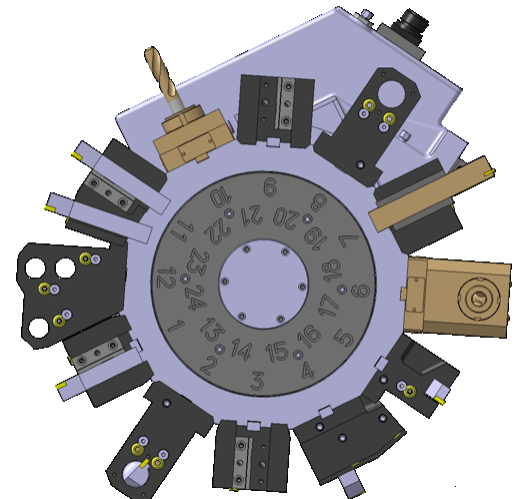


- **SUB SPINDLE PART EJECTOR / COOLANT FLUSH**

The sub spindle part ejector is a tube mounted inside the sub spindle drawtube. The ejector tube has a stroke of 120 mm (4.7") and is actuated by a pneumatic cylinder mounted behind the hydraulic cylinder used for chuck clamping. The part is ejected with less velocity than a conventional spring actuated part ejector. This helps eliminate surface marring. The long stroke of the ejector tube allows longer parts to be swallowed and removed. The coolant flush allows coolant to be applied through the bore of the ejector tube to remove chips from the work holding area or provide coolant for ID cutting operations on the sub spindle.

- **SERVO TURRET**

The non-lifting design eliminates the possibility of contamination reaching the coupling. This heavy-duty turret with a (230 mm) 9.05" curvic coupling and (53 kN) 11,915 lb of hydraulic clamping force, provides high rigidity for heavy stock removal, fine surface finishes, long boring bar overhang ratios, and extended tool life. Indexing repeatability is  $\pm 0.0005$  degrees. A high torque servo motor rotates the turret head at high speed. Turret clamp is confirmed by a proximity switch. Turret indexing is non-stop Bi-directional, with a fast 0.15 second adjacent station index time. Turret indexing is possible during the rapid traverse move away from the work piece. The large diameter 12 station turrets feature base mounted tooling with all tool holders being mounted to the periphery of the turret. All 12 stations can accommodate live tools. The turret has 24 position indexing to accommodate double turning tool and boring holders, increasing the number of tools in the turret. Holders are also available with tools facing both the main and sub spindles. This design gives the machine operator maximum flexibility when setting up a job and provides a large tool capacity for complex jobs and redundant tools for tool life management. Standard turning tool holders utilize 1.0" square shank tooling and ID tool holders have a maximum diameter of 2.0". Coolant is delivered to the cutting tool through the center of the turret. This style of coupling eliminates the coolant inducer normally found on the outside of the turret body.



- **24 POSITION TURRET INDEXING**

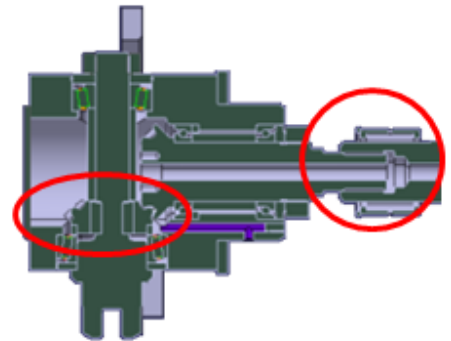
The servo turret has 24 position index capabilities to accommodate optional double and triple holders, increasing the number of available tools. 24 position holders mount on the standard 12 position turret. The 24 position feature can be turned on by keep relay selection.

- **TOOL HOLDERS FOR 24 POSITION INDEXING (OPTIONAL)**

Optional holders are required to use the 24 position turret indexing. Double and triple tool holders are available which locate one of the cutting tools at the half station index position.

- **ROTARY TOOLS**

Rotary tools can be mounted on all 12 turret stations. The 7.5 kW (10 hp) rotating tool motor delivers 95.5 Nm (70 ft-lb) of low end torque. It takes just .5 second for the turret to engage the rotating tools. The standard rotating tool holders have an RPM range of 5,000 rpm. The base mounted tool holders are bolted directly to the periphery of the turret for maximum rigidity and feature precision grease lubricated bearings. The holders are pre-lubed for 1,000 hours of operation. Rotating tool holders included with the standard machine can accommodate milling, drilling and rigid tapping. The holders use readily available ER 32 collets for milling, drilling and rigid tapping. Polar coordinate interpolation is provided for easy C-Axis contouring. Helical interpolation and cylindrical interpolation are both standard. Rigid tapping is standard. The improved rigidity and design includes double keyed bevel gear drive and splined motor power shaft.



- **PRECI-FLEX® TOOL SYSTEM**

The standard milling heads are Preci-Flex® ready. Preci-Flex is a tooling system made by Eppinger that utilizes the existing ER collet taper in the rotary holders. The spindle face is precision ground relative to the taper and there are four drilled and tapped holes in this face. The Preci-Flex adapters are attached with four bolts and locate on both the taper and the spindle face for maximum rigidity. A variety of Preci-Flex adapters are available for special applications. These include extended collet chucks for smaller diameter drills and to reach cross holes on small diameter work pieces. End mill adapters are available for heavier cutting without potential slippage. Three Preci-Flex adapters are included with the machine. Preci-Flex adapters are available from Exsys Tool Inc. Exsys Tool web site is [www.exsys-tool.com](http://www.exsys-tool.com).

- **OPTIONAL STATIC TOOL HOLDERS and ACCESSORIES**

**Note\*** these static tool holders listed in this quote is for reference only and can only be ordered thru DN Solutions Parts. Part numbers listed may change without notice and should be confirmed when placing order.

## Fanuc i Plus' operation panel enhances operating convenience



### Fanuc i Plus

- 15 inch color display  
Intuitive and user-friendly design

### USB & PCMCIA card QWERTY keyboard

- EZ-guide i standard
- Ergonomic operator panel
- 2MB Memory
- Hot key



### iHMI Touch screen option

- iHMI provides an intuitive interface that utilizes a touch screen for quick and easy operation

### Variety of applications

- Providing various applications related to PLANNING, MACHINING, IMPROVEMENT, and UTILITY for customer convenience.

