# LYNX 2600SY

*Product Quote*

**DN Solutions**
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DN SOLUTIONS

# LYNX 2600SY

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

Lynx 2600SY 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.

## MAIN FEATURES

- 25 hp high torque digital AC spindle motor
- Large 3.19" bar capacity
- High speed 3,500 rpm spindle
- High precision pre-tensioned X-axes double nut ball screw with electric torque limiter protection (Airbag Function)
- 12 station heavy duty servo controlled turret with 24 position indexing and (0.15 second) next station index
- Rigid 30-degree one piece cast iron slant bed
- Large 14.96" maximum turning diameter
- Widely spaced, high precision roller type linear motion guideways
- Main - sub spindle synchronization
- Fast 1,181 ipm Z axis rapid traverse
- Full contouring C-Axis on main and sub spindle
- Y axis mill / drill with rigid tapping on both main spindle, sub spindle and rotary tools. 3 rotating tool holders included in standard tooling package
- 5,000 rpm, 7 hp, rotating tool spindle motor. Live tools can be mounted on all stations
- Y-Axis turret with 4.13” (±2.065”) total travel
- Bolt up chip conveyor design for easy access and removal of coolant tank
- FANUC 0i-Plus control with iHMi touch screen interface with swiveling operator's panel
- EZ Guide I Conversational Programming
- Tool Load Monitoring System

## STANDARD EQUIPMENT AND WARRANTY

- Main spindle chuck: MH-210 10" Samchully 3-jaw chuck. 254 mm (10") diameter with 82 mm (3.23") bore, 4.4 mm (.173") jaw stroke – includes one set of soft jaws
- Main spindle chuck actuator with chuck clamp / unclamp proximity switches: SD-18582 hydraulic - 82 mm (3.23") through hole - 30 mm (1.18") stroke
- Sub spindle chuck: MH-208 8" Samchully 3-jaw chuck. 210 mm (8.26") diameter with 66 mm (2.59") bore, 3.7 mm (.145") jaw stroke – includes one set of soft jaws
- Programmable part catcher and part conveyor with bar feed interface standard
- Automatic tool setter
- Sub spindle part ejector with coolant flush
- 65 psi multi-stage coolant pumps
- Separate coolant tank with coolant level switch and cartridge lubrication system
- Automated metered lubrication system with oil skimmer
- P4 class spindle bearings and P4 class angular thrust bearings
- 725 psi hydraulic unit
- Air blast system for chuck cleaning
- Safety features: fully enclosed work area, door interlock, hydraulic pressure safety switch, spindle Interlock, program protect, chucking signal
- 3 color signal tower and work light
- Tool box with operating tools
- Leveling bolts and pads
- Turning center instruction, operation, parts list and electrical drawing manuals in hard copy format. FANUC manuals provided on USB drive (Hardcopy available for purchase, contact parts department)
- Chuck clamp / unclamp proximity switches (main and sub spindle)
- Two-year machine parts warranty, one year labor warranty. Two-year control warranty: Parts and Labor. See warranty pages for details.

## STANDARD TOOLING PACKAGE TURRET TOOL HOLDERS:

| Turret Holder Part # | Description | Quantity |
|---|---|---|
| 7.073.118 | Eppinger Preci-Flex BMT-55 ER25 X-axis (Straight) milling head | 2 |
| 7.073.280 | Eppinger Preci-Flex BMT-55 ER25 Z-axis (Angular) milling head (85mm CL) | 1 |
| 2501-0081 | Eppinger Preci-Flex ER25 collet chuck adapter | 1 |
| 2503-0102 | Eppinger Preci-Flex 5/8" Weldon type end mill holder | 1 |
| 2507-0262 | Eppinger Preci-Flex shell mill adapter with 3/4" arbor | 1 |
| 10000 EPPINGER | Spanner wrenches for Eppinger rotary tools | 1 |
| 850418-02732 | Tool holder - OD - Wedge clamp (3/4" sq) | 2 |
| L21590537E | Tool holder - OD Face - (R & L) (3/4" sq) | 1 |
| 850418-02734 | Tool holder - OD - Double - (R & L) (3/4" sq) | 1 |
| 850418-02913 | Tool holder - OD - Double - F (3/4" sq) (for 24 station index) | 1 |
| 850418-00242 | Tool holder - OD - Double - R (3/4" sq) (for 24 station index) | 1 |
| L21590587C | Tool holder - OD Cut-off - (RH) (3/4" sq) | 1 |
| L21590527C | Tool holder - ID - 1.250" ID | 1 |
| L21591114 | Cap - U-Drill for 1.250" ID holder - coolant through the drill / boring bar | 1 |
| 850418-02916 | Tool holder - ID - Triple - 1.000" ID (for 24 station index) | 1 |
| L21590927B | Sleeves - Boring bar (5 pc kit) - 1.250" OD X (0.375, 0.500, 0.625, 0.750 & 1.000" ID) | 1 |
| L32590217E | Sleeves - Boring bar (4 pc kit) - 1.000" OD X (0.375, 0.500, 0.625 & 0.750" ID) | 1 |
| L21590947 | Sleeves - U-Drill (2 pc kit) - 1.250" OD X (0.750 & 1.000" ID) | 1 |
| 110949-00146 | Sleeves - U-Drill (2 pc kit) - 1.250" OD X (0.750 & 1.000" ID) | 1 |

**LYNX 2600SY with FANUC 0i-Plus control**

# SPECIFICATIONS

## CAPACITY:

| | |
|---|---|
| Swing over bed | 630 mm (24.8") |
| Swing over carriage | 460 mm (18.1") |
| Maximum turning diameter | 380 mm (14.96") |
| Maximum turning length | 610 mm (24.0") |
| Distance between main and sub spindle nose | 954 mm (37.56") |

## MAIN SPINDLE:

| | |
|---|---|
| Spindle speed | 3,500 rpm |
| Spindle nose | A2-8 |
| Draw tube ID | 82 mm (3.23") |
| Standard chuck through hole ID | 82 mm (3.23") |
| Spindle bore diameter | 91 mm (3.58") |
| AC spindle motor (S6 25% rating) | 18.5 kW (25 hp) |
| Maximum spindle torque (S6 25% rating) | 403 Nm (297 ft-lb) |
| Standard chuck size | 254 mm (10") |
| Max Bar Length (for bar feed application) | 915 mm (36”) |

## C-AXIS – MAIN SPINDLE:

| | |
|---|---|
| Minimum programmable angle | 0.001 degree |
| Rapid traverse rate | 150 rpm |
| C-axis repeatability | ±0.006 degree |
| C-axis positioning accuracy | 0.0167 degree |

## SUB SPINDLE:

| | |
|---|---|
| B axis travel (sub spindle) | 680 mm (26.77”) |
| Sub spindle guideway span | 300 mm (11.8") |
| Spindle speed | 4,500 rpm |
| Spindle nose | A2-5 |
| Draw tube ID | 50 mm (1.96") |
| Standard chuck though hole ID | 66 mm (2.59") |
| Spindle bore diameter | 61 mm (2.4") |
| AC spindle motor S6 25% rating | 7.5 kW (10 hp) |
| Maximum spindle torque (S6 25% rating) | 84 Nm (62 ft-lbs) |
| Standard chuck size | 210 mm (8") |

## C-AXIS – SUB SPINDLE:

| | |
|---|---|
| Minimum programmable angle (degrees) | 0.001 deg |
| Rapid traverse rate | 150 rpm |
| C-axis repeatability | ±0.006 deg |
| C-axis positioning accuracy | 0.0167 deg |

**BED, SADDLE & CROSS SLIDE:**

| | |
|---|---|
| Angle of slant bed | 30-degree |
| X axis travel | 250 mm (9.8") |
| Z axis travel | 680 mm (26.77”) |
| X axis guide way span | 378 mm (14.88") |
| Z axis guide way span | 445 mm (17.5") |
| X axis rapid traverse rate | 30 m/min (1,181 ipm) |
| Z axis rapid traverse rate | 30 m/min (1,181 ipm) |
| X axis ball screw diameter | 32 mm (1.26") |
| Z axis ball screw diameter | 36 mm (1.4") |
| X axis feed thrust (continuous) | 9,421 N (2,118 lb) |
| X axis feed thrust (intermittent) | 14,132 N (3,177 lb) |
| Z axis feed thrust (continuous) | 9,421 N (2,118 lb) |
| Z axis feed thrust (intermittent) | 14,132 N (2,382 lb) |
| X axis repeatability | ±0.002 mm (±0.00008") |
| Z axis repeatability | ±0.003 mm (±0.00012") |

**TURRET:**

| | |
|---|---|
| Number of tools | 12 |
| Number of index positions | 24 |
| Tool holder type | BMT-55 |
| Turning tool shank size | (metric turret 20 mm) .75" |
| Boring bar diameter | (metric turret 32 mm) 1.25" |
| Turret index time (next station swivel time) | 0.15 second |
| Tool selection | Bi-directional |
| Curvic coupling diameter | 203 mm (8.0") |
| Turret clamping force | 66 kN (14,837 lb) |
| Turret index repeatability | ±0.0005 degree |

**ROTARY TOOLS:**

| | |
|---|---|
| Rotating tool RPM | 5,000 rpm |
| Rotating tool spindle motor (S3 15% rating) | 5.5 kW (7 hp) |
| Rotating tool torque (S3 15% rating) | 42 Nm (31 ft-lb) |
| Rotating tool collet type | ER 25 |
| Milling collet capacity | 5/64 to 5/8" |

**Y-AXIS:**

| | |
|---|---|
| Y-axis travel (total) | 105 mm (±52.5mm) (4.13” (±2.065”)) |
| Y-axis travel (above center) | 52.5 mm (2.065”) |
| Y-axis travel (below center) | 52.5 mm (2.065”) |
| Y-axis rapid traverse rate | 10 m/min (394 ipm) |
| Y-axis repeatability | ±0.003 mm (±0.00012") |
| Y-axis feed thrust (continuous) | 7,758 N (1,744 lb) |
| Y-axis feed thrust (intermittent) | 12,414 N (2,790 lb) |

**COOLANT SYSTEM:**

| | |
|---|---|
| Coolant pump pressure | 4.5 bar (65 psi) |
| Coolant pump motor | .75 kW (1.0 hp) |
| Coolant tank capacity | 247 l (65 gal) |

**HYDRAULIC / LUBRICATION:**

| | |
|---|---|
| Hydraulic tank capacity | 20 l (5 gal) |
| Hydraulic oil required* | ISO VG32 |
| Way lubrication tank capacity | 2 l (0.5 gal) |
| Way lubrication oil required* | ISO VG68 |
| Way lubrication grease capacity | .7 l (.18 gal) |
| Way lubrication grease required* | HGP-10LMG |

** Cross reference these numbers for other brands*

**GENERAL:**

| | |
|---|---|
| Machine weight | 6,000 kg (13,225 lb) |
| Floor space - length x width | 3,425 mm x 1,920 mm (135" x 75.6") |
| Floor space – length with hinge belt chip conveyor | 4,372 mm (172") |
| Machine Height | 2,095 mm (82.5") |
| Height from floor to spindle center | 1,110 mm (43.7") |
| Voltage required | 205-235V/3 ph/60 Hz |
| Power requirement | 38 kVA (99 Amps @ 220 Volts) |

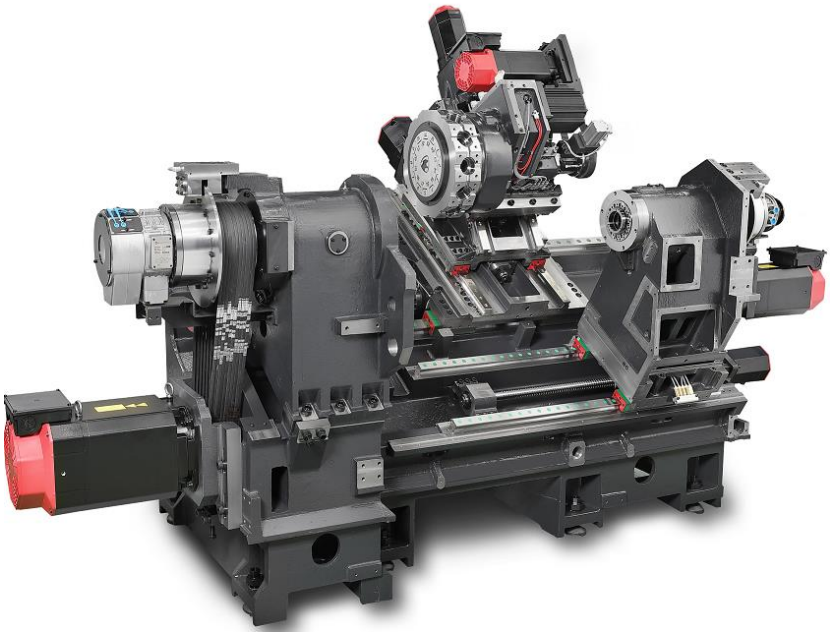
*It is the purchaser's responsibility to insure correct power requirements are met and properly supplied to the machine tool*

*Accuracy data in the specifications are measured using KS B 4207*

# CONSTRUCTION

- **BED**

The LYNX 2600SY bed is a one piece Meehanite® casting to prevent 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 LYNX 2600SY 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.

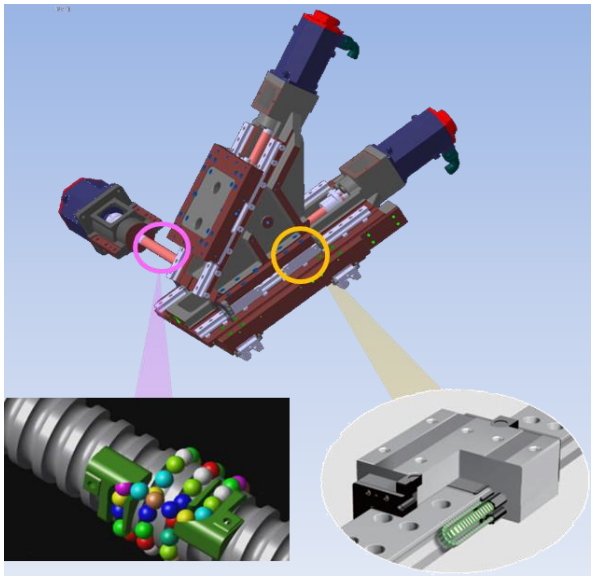


- **GUIDEWAYS**

Machine tool rated high precision full roller type linear guideways on all axes allow high rapid traverse rates with extra high load capacity and rigidity. The circular-arc contact design uses four guide blocks for maximum rigidity and accuracy. The X-axis rapid traverse is 30 m/min (1,181 ipm) and the Z-axis rapid traverse is 30 m/min (1,181 ipm). The heavy-duty guideway rails are 28 mm (1.1") wide in the X-axis and 34 mm (1.34") in the Z-axis. Widely spaced for maximum stability, the guideways are fully protected by heavy gauge steel covers.

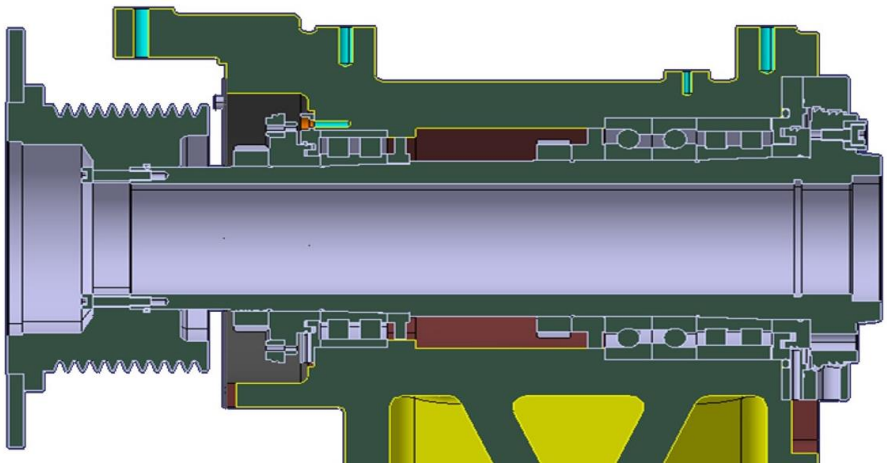
- **BALL SCREWS AND AXIS DRIVES**

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 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 ground surface to maintain perfect alignment and center height regardless of the bed temperature. The heavy duty spindle is supported by double row angular ball bearings and single row or roller bearings in the front and double row roller bearings in rear. Cylindrical roller bearings feature a large contact surface which ensures 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 NTN bearings are perfectly balanced to allow high spindle speeds. Front bearing inner diameter is 130 mm (5.12") and the bar capacity is 81 mm (3.19").



- **SPINDLE DRIVE**

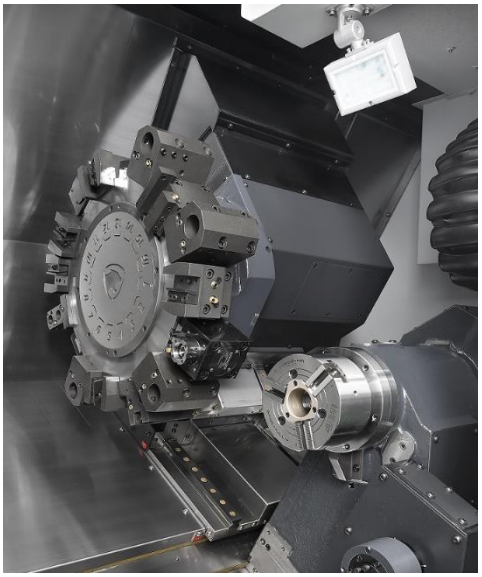
The LYNX 2600SY features a powerful 18.5 kW (25 hp) FANUC digital AC spindle motor. This high torque motor provides fast spindle acceleration and plenty of power for heavy stock removal reducing the number of roughing passes required. Full power is available from 438 rpm with an impressive 403 Nm (297 ft-lb) of torque. The spindle motor is flange mounted on the side of the bed casting, assuring perfect alignment with the headstock. 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, controlling both the spindle in 2-axis mode and full contouring C-axis in the 3-axis mode. Switching between the two modes is virtually instantaneous.

- **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 LYNX 2600SY 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 84 Nm (62 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 4,500 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")

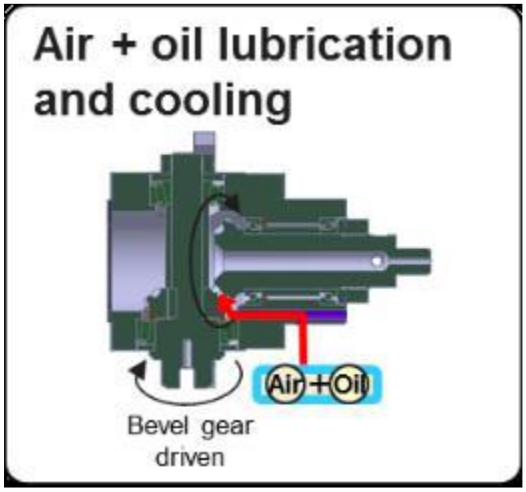
- **SUB SPINDLE PART EJECTOR / COOLANT FLUSH**

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**

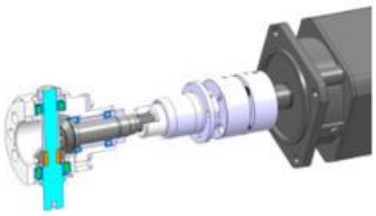
The non-lifting design eliminates the possibility of contamination reaching the coupling. This heavy-duty turret with a (203 mm) 8.0" curvic coupling and (66 kN) 14,837 lb of hydraulic clamping force, provides high rigidity for heavy stock removal, fine surface finishes, long boring bar overhang ratios, and extended tool life. Indexing repeatability is ±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 .75" square shank tooling and ID tool holders have a maximum diameter of 1.25". 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.



- **ROTARY TOOLS**

Rotary tools can be mounted on all 12 turret stations. The 5.5 kW (7 hp) rotating tool motor delivers 42 Nm (31 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 25 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.

**Direct coupled milling spindle**



- **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.

- **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.*

**(for standard 24 position indexing):**

| Part Number | Description |
|---|---|
| 850418-00242 | Tool holder - OD - Double - R (3/4" sq) (for 24 station index) |
| 850418-02734 | Tool holder - OD - Double - (R & L) (3/4" sq) |
| 850418-02913 | Tool holder - OD - Double - F (3/4" sq) (for 24 station index) |
| 850418-02916 | Tool holder - ID - Triple - 1.000" ID (for 24 station index) |
| L21590527C | Tool holder - ID - 1.250" ID |
| L21590537E | Tool holder - OD Face - (R & L) (3/4" sq) |
| L21590587C | Tool holder - OD Cut-off - (RH) (3/4" sq) |
| 850418-02732 | Tool holder - OD - Wedge clamp (3/4" sq) |
| L21596513B | Sleeve - Boring bar - 1.250" OD X 0.375" ID |
| L21596523B | Sleeve - Boring bar - 1.250" OD X 0.500" ID |
| L21596533B | Sleeve - Boring bar - 1.250" OD X 0.625" ID |
| L21596543A | Sleeve - Boring bar - 1.250" OD X 0.750" ID |
| L21596553A | Sleeve - Boring bar - 1.250" OD X 1.000" ID |
| L21596913 | Sleeve - U-Drill 1.250" OD X 0.750" ID |
| L21596923 | Sleeve - U-Drill 1.250" OD X 1.000" ID |
| L32514713D | Sleeve - Boring bar - 1.000" OD X 0.375" ID |
| L32514723D | Sleeve - Boring bar - 1.000" OD X 0.500" ID |
| L32514733D | Sleeve - Boring bar - 1.000" OD X 0.625" ID |

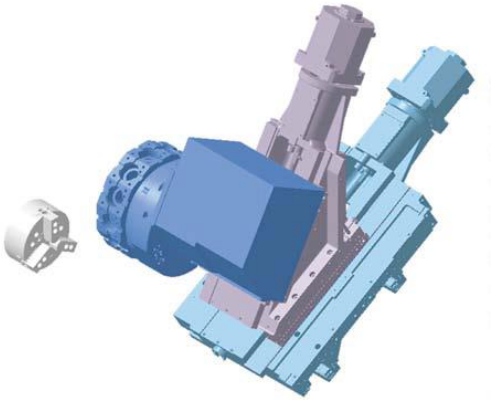
| | |
|---|---|
| L32514743D | Sleeve - Boring bar - 1.000" OD X 0.750" ID |
| L21591114 | Cap - U-Drill for 1.250" ID holder - coolant through the drill / boring bar |

**(for optional 12 station tooling):**

| Part Number | Description |
|---|---|
| 850418-00080 | Tool holder - ID - 1.500" ID |
| 850418-00082A | Tool holder - ID - Double - 1.000" ID |
| 850418-00074B | Tool holder - OD - (R & L) (1" sq) |
| 850418-00076A | Tool holder - OD - Double - (R & L) (1" sq) |
| 850418-02814 | Tool holder - OD Cut-off - (RH) (1.0" sq) |
| L31560637D | Tool holder - OD Face - (R & L) (1" sq) |
| 110949-00129 | Sleeves - U-Drill (2 pc kit) - 1.000" OD X (0.625 & 0.750" ID) |
| 110949-00720 | Sleeve - U-Drill 1.500" OD X 0.750" ID |
| 110949-00721 | Sleeve - U-Drill 1.500" OD X 1.000" ID |
| 110949-00722 | Sleeve - U-Drill 1.500" OD X 1.250" ID |
| L31512713E | Sleeve - Boring bar - 1.500" OD X 0.375" ID |
| L31512723E | Sleeve - Boring bar - 1.500" OD X 0.500" ID |
| L31512733E | Sleeve - Boring bar - 1.500" OD X 0.625" ID |
| L31512743D | Sleeve - Boring bar - 1.500" OD X 0.750" ID |
| L31512753D | Sleeve - Boring bar - 1.500" OD X 1.000" ID |
| L31512763D | Sleeve - Boring bar - 1.500" OD X 1.250" ID |
| L32514713D | Sleeve - Boring bar - 1.000" OD X 0.375" ID |
| L32514723D | Sleeve - Boring bar - 1.000" OD X 0.500" ID |
| L32514733D | Sleeve - Boring bar - 1.000" OD X 0.625" ID |
| L32514743D | Sleeve - Boring bar - 1.000" OD X 0.750" ID |
| L31563104 | Cap - U-Drill for 1.500" ID holder - coolant through the drill / boring bar |
| L32563134C | Cap - U-Drill for 1.000" ID holder (Sub) - coolant through the drill / boring bar |

- **Y-AXIS**

The Y-axis greatly increases the number of work pieces that can be machined complete without using expensive custom rotary tool holders. The Y-axis enables the milling cutter, drill or tap to machine above or below centerline. A few of the operations possible with Y-axis are drilling and tapping of off-center cross holes, milling of flats, and rough and finishing of key-ways. The Y-axis is a double slide wedge type. When a Y-axis move is commanded, the X-axis and the wedge both move automatically to produce the up or down Y-axis movement. The wedge has its own guideways, ballscrew and (1.8 kW) 2.4 hp FANUC servo motor. The Y-axis stroke is (105 mm (±52.5mm)) 4.13" (±2.065"), (52.5 mm) 2.065" above and (52.5 mm) 2.065" below center.



Note: Among the factors effecting Y-Axis travel are distance to spindle center line and tool diameter and length. Available Y-axis travel is limited when approaching the X-axis travel limits. For applications with critical Y-axis requirements you should review your requirements with DN Solutions application department.

- **AUTOMATIC TOOL SETTER**

Tool offsets can be quickly and conveniently set with the automatic tool setter, reducing set-up time by minimizing the need for manual skim cuts, measurement, and entering tool offsets. The tool setter arm is brought down either by switch or program function. The arm is made of tubular steel to minimize thermal expansion. A four-position touch sensor mounted on the end of the arm allows tool setting in any direction. As tools are touched-off on the sensor, tool offset values are automatically calculated and entered. The tool setter design will clear most chucks up to 315 mm (12") diameter.

- **PART CATCHER (Standard)**

The part catcher permits unattended operation with a barfeeder. The part catcher design allows the basket to remain vertical until just before the part is discharged through an opening under the machine door. Parts accumulate in a box mounted to the machine front. The part catcher can handle parts 130 mm (5.12") long at a diameter of 75 mm (2.95") and a maximum part weight of 3 kg (6.6 lb).

- **PART CONVEYOR (Standard)**

A part conveyor is available for more advanced part handling applications. In this case, parts are deposited on a conveyor belt and moved to the right hand side of machine where they can be offloaded either manually or through robotic application.

- **GREASE LUBRICATION**

A cartridge lubrication system protects all guideways and ball screws. The ecofriendly grease lubrication system requires less maintenance and using less lube than oil systems reducing operational cost. One grease cartridge can last as long as 6 months and doesn't contaminate the coolant with tramp oils. When the remaining grease is approximately 10% of whole cartridge, a warning alarm will appear.
When the grease is completely exhausted, the grease unit can detect it so that another alarm appears and prevents the machine from restarting until the cartridge is replaced.

- **Oil LUBRICATION (Rotary Tool Models Only)**

The automatic forced lubrication is provided on live tool models. Maintenance free piston distributors deliver a precise quantity of oil to the rotary tool bevel gears only. The piston distributors are non-clogging and the design allows way lube consumption to be minimized. The 2 l (.5 gal) reservoir is mounted on the front of the machine and lasts up to 6 months. A low-level alarm prevents the machine from restarting until the oil reservoir is replenished. System pressure is monitored to detect open or broken lube lines.

- **COOLANT SYSTEM**

A .75 kW (1.0 hp) high capacity multi-stage centrifugal pump delivers a high volume of coolant through the turret to ball nozzles at each turret station. The pump delivers 4.5 bar (65 psi) of pressure, which meets the requirements of most insert drill manufacturers. The high pressure flushes chips out of the drilled holes and reduces the need for time consuming peck drilling cycles. High coolant pressure also significantly increases tool life. A flow control valve located at the coolant pump allows pressure and flow rate to be reduced if necessary. The large coolant tank has a 247 l (65 gal) capacity. The coolant tank and chip pan are separate from the machine bed, greatly reducing heat transfer from chips and coolant to the machine casting. The coolant tank pan is mounted on rollers and can be removed without the chip pan and conveyor for easy cleaning. Screen filters prevent small chips from reaching the coolant pump.

***NOTE* WATER BASED COOLANT***

*Turning centers are designed for use with water based coolant fluid only. The use of non-water based cutting oils requires special consideration. Some cutting oils can create excessive heat and affect the accuracy of the machine tool and even damage the machine tool or coolant system which will void the machine warranty. If cutting oil is to be used, please discuss the oil viscosity and composition of your oil from your coolant manufacture's material safety data sheet (MSDS) or the product data sheet (PDS) with DN Solutions service. High pressure coolant (HPC) options for non-water based coolant must be reviewed directly by the HPC system's manufacturer to determine the correct equipment.*

- **145 PSI COOLANT (Optional)**

Higher pressure coolant can improve cycle times, improve finishes and increase tool life. A larger 145 PSI multistage coolant pump is available as an option. This pump replaces the existing 65 PSI flood coolant pump and more than doubles the coolant pressure. 145 PSI flood coolant is helpful in removing chips from deep holes, ensuring that coolant is reaching the cutting edge and removing more heat from the process.

- **1,000 PSI COOLANT (Optional)**

1,000 PSI coolant is an available option. With flood coolant, a vapor blanket forms over the cutting area and prevents the coolant from actually reaching the tool tip. Heat is removed by radiating through this blanket and by conduction from areas around the cut. 1,000 PSI coolant pressure can be directed to penetrate the vapor blanket and reach the tool tip. Chips will break better and finishes will improve. Tool life can be significantly longer, even with increased feeds and speeds. The 1,000 PSI pump options in this quotation will allow both high pressure and normal flood coolant (M-code selectable).

- **WAYLUBE SEPARATION SYSTEM**

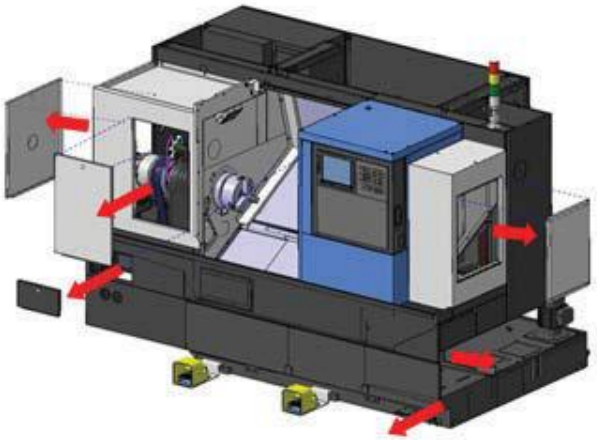
The bed casting has channels that deliver way lube from the Z axis into a separate reservoir. An oil skimmer picks up remaining waste oil from the coolant tank and deposits it into the same reservoir. As a result the coolant is kept clean and coolant life is extended. Waste oil tank can be conveniently drained.

- **CHIP GUARDING**

Chips and coolant are contained by the fully enclosed guarding made of heavy gauge sheet metal. Improved guarding directs the chips and coolant to the chip pan keeping the work area cleaner. The door moves effortlessly on a round steel rail. The double-layer viewing window features tempered safety glass on the inside, which resists scratching and an outside layer of Lexan which is virtually impenetrable.

- **MAINTENANCE ACCESIBILITY**

Redesigned machine guarding improves service and operator access. Convenience and protection are increased.



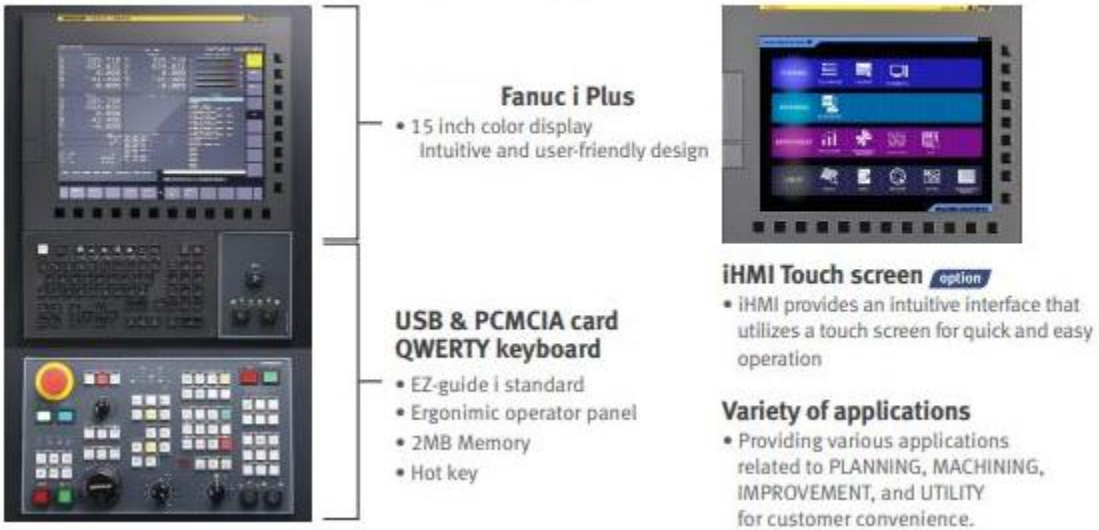
- **CONVENIENT OPERATION**

The vertical / slant type operator's console with ergonomic design is mounted on the right side and swivels for easy viewing. All push buttons on the operator's panel are sealed from coolant or dirt. To minimize set-up time, manual controls are provided for turret indexing, spindle, and feed functions. Controls and gauges for adjusting chuck pressure are located on the front of the machine.

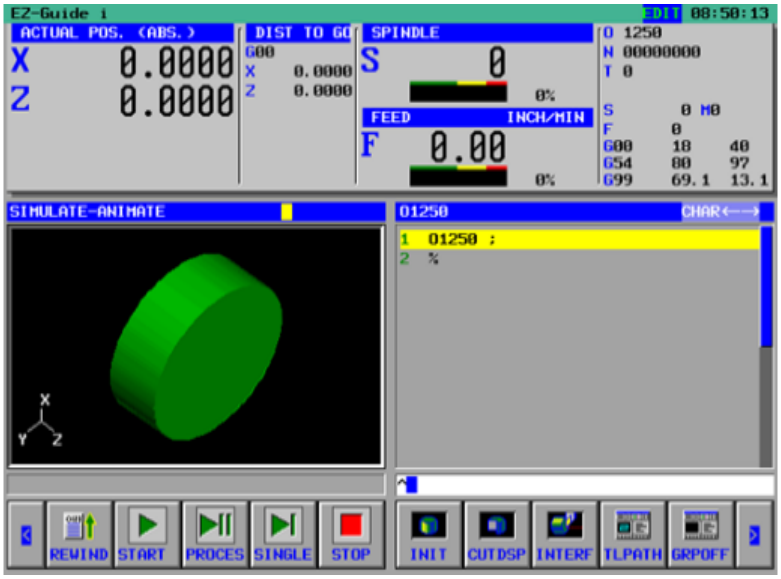
The LED work light is mounted to top of machine to prevent glare and reduce shadows in work area. The Eco-friendly shut off function lowers electric consumption and benefit machine accuracy by reducing heat buildup. The energy saving LED work light turns off if there is no control panel or door operation for ten minutes. Operator activity restores normal machine function.

New buzzer confirmation is available for chuck clamp, touch of tailstock onto the workpiece, program finish confirmation.

Fanuc i Plus' operation panel enhances operating convenience



- **EZ Guide *i***




EZ Guide *i* enables users to program and run the machine on the shop-floor using a conversational programming system allowing the user to program using friendly dialog buttons. EZ Guide *i guides* users thru variables to complete common pattern cycle functions. Roughing, finishing, castings, grooving, threading, peck drilling and more are all accomplished thru EZ Guide's menu functions. A customized tool offset screen with an area for describing cutting edge angles, tool length and cutting parameters allows quick and easy input without the need for a predefined tool database. EZ Guide *i* code is already in control compatible NC format similar to the pattern cycles found in the standard FANUC programming manual. Traditional G code programs easily combine with EZ Guide *i* code in the same program and are executed, simulated, or edited on the same screen.

- **EASY OPERATION PACKAGE**

Easy Operation Package (EOP) developed for customers to allow easy setup, operation and maintenance settings users require.
EOP features include:

  - **Tool load monitor**

    High and low limits can be set for each tool with wear and breakage settings to trigger alarms, tool change or shutdown.

  - **Optional block skip**
  - **Tool management**
  - **Alarm Guidance (included in iHMI touch panel)**
  - **Work auto setup**

EOP provides libraries for reference on G-Codes/M-Codes, Alarms and Parameters.

## FANUC 0iTP with TOUCH PANEL, SPECIFICATION FOR LYNX MODELS

High resolution color LCD display
Digital AC servos and spindle drives
Part program storage (2Mb)
1000 registrable programs
128 pairs of tool offsets
Constant surface speed control
0.0001” minimum programmable increment
Tool Monitoring System

15” color LCD with touch panel
Nano interpolation
Backlash compensation
Self-diagnostic functions
FANUC embedded Ethernet function
PCMCIA slot (for memory or modem card)
USB port
Multi language display (18 choices)
EZ Guide *i* programming

Controllable axes (up to 4 simultaneous):

| 2-Axis | Milling | Y-Axis Milling | Milling with sub spindle | Y-Axis milling with sub spindle |
|---|---|---|---|---|
| 2 | 3 | 4 | 4 | 5 |
| X / Z | X / Z / C | X / Y / Z / C | X / Z / C / B | X / Y / Z / C / B |

STANDARD PROGRAMMING FEATURES:

Direct drawing (line / angle) programming
Extended editing including cut and paste
Background editing
Password function
Absolute / incremental programming
Decimal point programming
Circular interpolation by radius designation
Polar coordinate interpolation (note 1)
Helical interpolation (note 2)
Cylindrical interpolation (note 1)
Polygon turning (note 1, 3 and 5)
Stored stroke check 1, 2 and 3
2nd reference point return
3rd/4th reference point return
Exact stop mode
Custom macro
Addition of custom macro variables
Interruption type custom macro (note 4)

Drilling canned cycles including rigid tapping (G81-G89)
Programmable work coordinates (G54-G59)
Tool nose radius compensation (G40-42)
Multiple repetitive cycles type I (G70-G76)
Multiple repetitive cycle type II (pocketing)
Canned cycles (G90,G92,G94)
Skip function (G31) / high speed
Reference point returns (G27-G30)
Programmable data input (G10)
G code system A/B/C
FANUC 10/11 tape format
Subprogram - 10 levels nested
Continuous thread cutting
Multiple lead thread cutting
Variable lead thread cutting
Thread chamfering on / off
.00001” program & offset increment (note 3)

Note 1: C-axis models only
Note 2: Y-axis models only
Note 3: Parameter changes required
Note 4: May require special engineering
Note 5: Consult DN Solutions Engineering before planning to use polygon turning. There are limitations in hex cutting capacity.
Re-trace or re-cut is not possible.

STANDARD OPERATION FEATURES:

Tool path graphic display
Tool life management
Extended tool life management
Parts counter display
Additional block skip
Direct input of offset value measured
Keyboard type manual data input (MDI)
Rapid traverse, feed rate and spindle speed override
Help function
Incremental offset
Manual absolute on and off

Geometry and wear offsets
Automatic tool offset calculation
Input / output interface (RS-232C)
Thread cutting retract
Program protect key
On-screen spindle and axis load meter display
Run hour display
Alarm and alarm history display
External message display
Operation history display
Clock function
Canned cycle graphic assist input