



# MTX Series

Multi-Tasking Machines



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## OVERVIEW

The MTX Series is state-of-art designed machine from Jyoti, to cater special needs of those complex components, demanding 5-Axis complex precise milling + precise 4-Axis turn-mill operations in single machine with very high accuracy output in 3D contour profile.

MTX series machines are multi tasking machines offers uninterrupted & unmanned machining of typical applications demanding with close tolerance machining for industries like Aerospace, Automotive, Mechanical, Power Generation, Oil & Gas, etc.

- Highly reliable and thermally stable graded CI structure delivering highest part accuracy in multi-axis machining with precision.
- 60° slant bed structure with roller type heavy duty LM guideways for maximum stability and anti vibration behavior by considering force transmitted from turning, boring & milling operations
- Inclined saddle on rear part of the structure make perfect equilibrium in mass balancing
- Cost and time saving for hardened steel to aluminum material machining with more flexibility, reduced setup time and least clamping.
- Absolute measuring scales in all liner axes for maximum accuracy
- 0.001° resolution of the angle encoder for rotary axes to achieve high surface quality
- Fully flexible design to adopt options of sub-spindle instead of tailstock and steady rest instead of turret



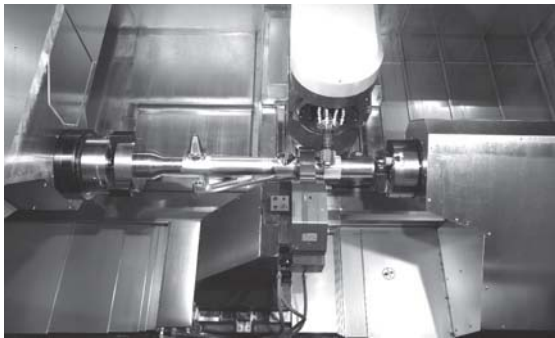
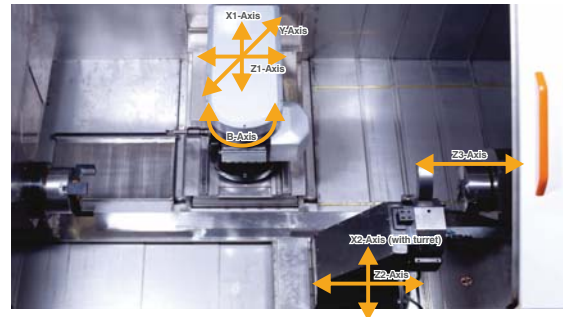
MTX series machines are perfectly designed and developed to accomplish various critical component machining application such as 5-Axis Milling, Drilling, Boring, Cam Profiling, B-Axis Turning, Cam Shaft Turning, Grinding, Gear Hobbing, Shaping, Off Center Angular Machining in a single machine. MTX series is the perfect solution for the complex and high precision jobs like landing gears, crankshaft, diffuser and helical gear. It reduces the multiple setups and offers highly accurate finished products.





### PRECISION AXIS

- Widely spaced L.M. guideways with high rapid traverse rate up to **40 m/min**
- Off-center machining with bigger Y-Axis travel up to **600 mm**
- High precision positioning accuracy by linear glass scale
- Special algorithm and better acceleration for better dynamics in 5-Axis cutting
- **6-sided complete Milling & Turning** of complex workpieces in single setup part clamping.
- Separate slide for tailstock and steady rest moment
- High precision pre-loaded ballscrew for long term accuracy
- Productivity with high accuracy for complex jobs requiring machining with interpolation of 4<sup>th</sup> or 5<sup>th</sup> Axis

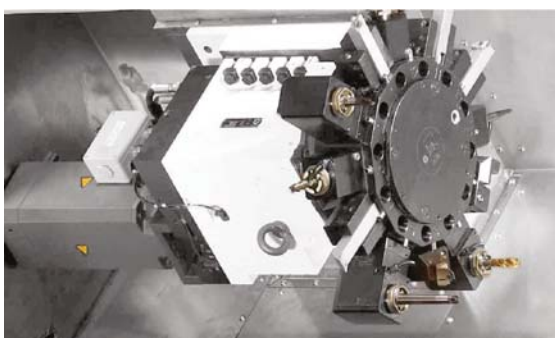


### MAIN & SUB-SPINDLE (Motorized)

- Both turning spindles having C-Axis with hyd. braking system for milling operations
- High Power & High Torque **Motorized Spindles** with chiller unit for better provision of heat dissipation
- Sub-spindle having independent travel (Z3-Axis) to collect job from main spindle for 2nd set-up machining
- For long jobs, both main and sub-spindle can work in synchronization for various typical turning and milling operations
- Separate C-Axis drive for synchronized turn-mill operation at low rpm
- Hydraulic work holding

### MILLING SPINDLE (B-AXIS)

- 5-Axis capability for complex profile machining, working with C-Axis
- B-Axis with direct drive for up to **60 rpm** rapid traverse
- Hydraulic locking for milling spindle for turning operations
- Effectively can hold & do boring up to **1000mm** long boring bar
- Full Z-Axis stroke of spindle to work with main and sub-spindle
- Heavy inside machining with long tool
- Through coolant facility up to **80 bar** pressure
- Geared Milling Spindle option available for high torque requirements
- CAPTO taper available as an option



### LOWER LIVE TOOL TURRET

- VDI 50 Live Tool Turret for better rigidity against cutting force and higher boring capacity
- Live tool for milling operations with suitable power and speed
- Flexible lower slide with option of steady or turret
- Through coolant facility available

### SERVO PROGRAMMABLE STEADY REST

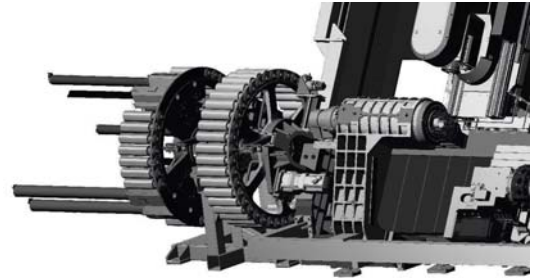
- Hydraulic operated turret head steady rest to support long components
- Bigger size separate servo driven steady rest instead of lower turret

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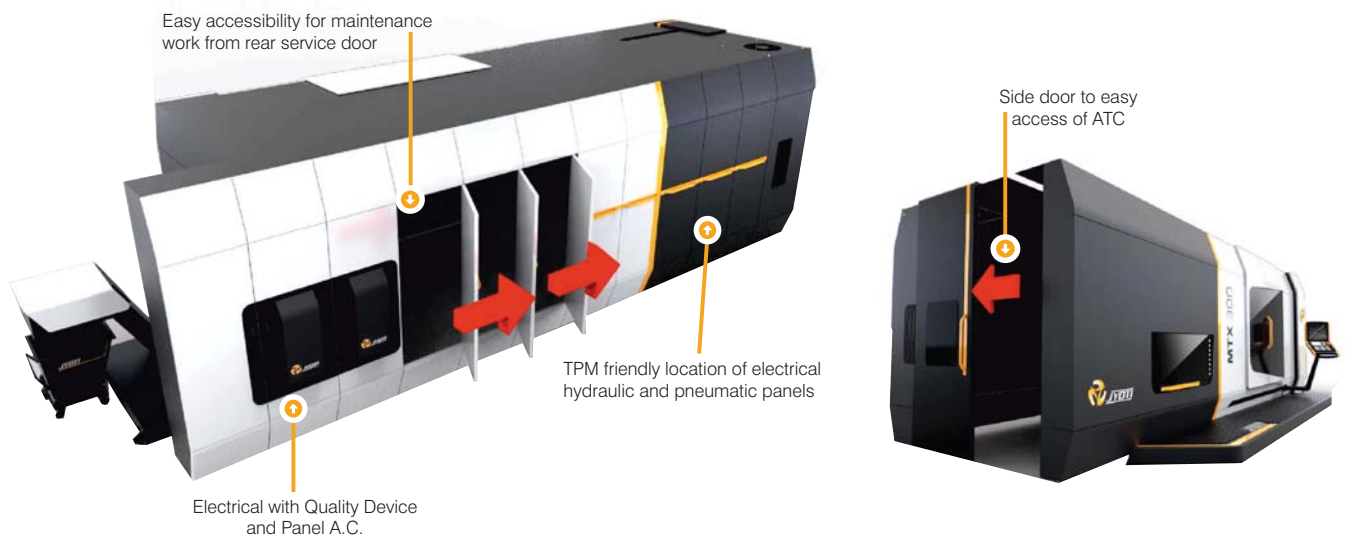
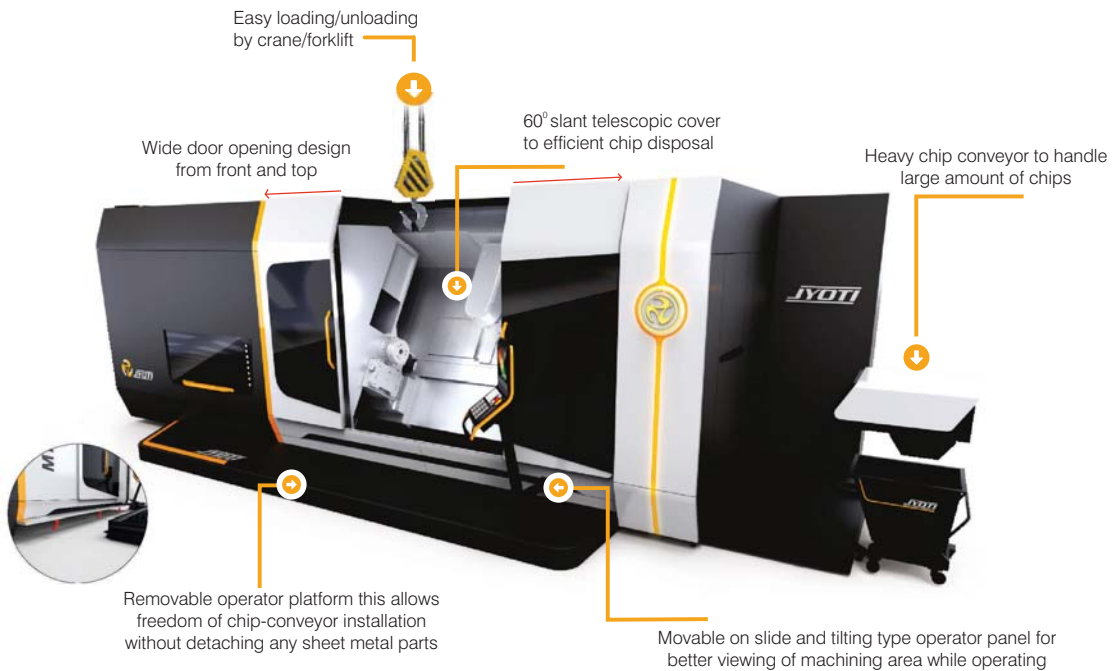
## AUTOMATIC TOOL CHANGER

- 40 tool ATC provided to accommodate various tools to support variety of operations.
- Tool change in any Z-Axis position.
- Optional ATC available to hold 6 long boring tool up-to **1000mm** long and **100 kg** weight.
- Additional transfer unit for long boring tool
- Option available of 80, 120 tool changer



## ERGONOMIC DESIGN

- Tool magazine outside of working area
- Complete safeguard ensuring safety of the machine, the operator and working environment
- Easy access to spindle from front
- Electrical cabinet fixed on the rear of the portal and IP 54 protection





### ADDITIONAL PRODUCTIVITY IMPROVEMENT CYCLES WITH SIEMENS 840D SL

- 5-Axis simultaneous machining cycle for 5-Axis interpolation at the main and counter spindle with B-Axis
- Special cycle for Shaping, Drilling, Tapping, Multi threading, B-Axis turning, Turn-Milling, Circular milling cycles
- Gear Hobbing cycle for generation of gear teeth and helical gear
- Cam Milling, Gun Drilling and Boring with long tool cycles
- Grinding and fine machining cycle
- Eccentric turning and milling cycle
- CAM Programming with NX CAM
- In-process measuring cycle

### 7<sup>th</sup> SENSE

We lead the fourth industrial revolution in CNC automation and manufacturing with 7<sup>th</sup> SENSE. The next generation's i4.0 tool that redefines the conventional PPC model to Plan. Produce. Complete.

## The Next-Gen Industry 4.0 Tool.

## Redefining PPC Plan. Produce. Complete.

### Cockpit

Comprehensive Dashboard

### OEE

Live Overall Equipment Efficiency

### Production

Scheduling & Productivity Monitoring

### Live

Machine Monitoring

### Reports

Intelligent Reports

### Health

Health Monitoring

### Tool

Tool Life Management

### Big Data

Cloud / Local data Management

#### Master Modules & Productivity Features

- Machine, Part, Shift Management
- Production Scheduling Tool
- Daily Production & Virtualization
- Daily Task Manager / Reports
- Alarm Logs
- Dedicated operator Screen\*\*
- Live Breakdown Alarms
- Virtual Screen
- Live Production & Machine Monitoring
- Planned Downtime Management
- Downtime & Productivity Alerts
- User Management (Operator, Supervisor etc.)

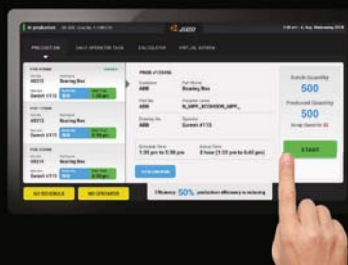
#### Health Monitoring Features\*

- Live Machine Health Monitoring
- Machine Health Alarms Logs & Analysis
- Spindle : Bearing Temperature, Head Stock Temperature, Vibration, Load, Power Utilization, Run Hours
- Coolant : Flow, Pressure, Temperature & Coolant Level
- Hydraulic : Pressure Status, Oil Level Status, Oil Temperature
- Gear Box : Lubrication Temperature, Oil Level and Filter Obstruct
- Axis Lubrication : Oil & Pressure Level
- Pneumatic Pressure
- Electrical Cabinet Temperature

#### Smart Reports & Analysis

- OEE & Down Time Analysis
- Availability Chart
- Good/Scrap Parts
- Machine Utilization
- Production Trend
- Speed-loss Analysis
- QMS\*\*\*

#### Smart Operator Panel



- Cycle Time Analysis
- Live Production update
- Live machine schedule screen
- Live Downtime Reasons
- Drawing View in Single Tap
- Daily Operator Task
- Customizes Screen Availability



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MACHINING CAPACITY		MTX 200 1050 / 1550	MTX 300 1250 / 2150 / 3150	MTX 400 2150
Swing Over Bed	mm	500	520	800
Max. Turning Diameter (with Milling Spindle)	mm	500	520	700
Max. Turning Diameter (with Lower Turret)	mm	350	350	---
Distance Between Main Spindle & Sub Spindle	mm	1350 / 1850	1400 / 2300 / 3300	2300
Maximum Turning Length	mm	1050 / 1550	1250 / 2150 / 3150	2000
Distance Between Main Spindle & Tail Stock	mm	1350 / 1850	1400 / 2300 / 3300	2300

AXIS TRAVELS				
X1 - Axis (Milling Spindle)	mm	600 (-100,+500)	620 (-20,+600)	700 (-20,+680)
Y - Axis (Milling Spindle)	mm	±125	±150	600 (-200,+400)
Z1 - Axis (Milling Spindle)	mm	1050 / 1550	1250 / 2150 / 3150	2150
X2 - Axis (Lower Turret)	mm	220	230	230
Z2 (Lower Turret) & Z3 (Sub-Spindle)* Axis	mm	1050 / 1550	1250 / 2000 / 3000	2000
B-Axis Milling Spindle	Degree	±120	±110	±110

RAPID FEED				
X1 / Y / Z1 Axis (Milling Spindle)	m/min	40 / 40 / 40	40 / 40 / 40	20 / 15 / 20
X2 / Z2 Axis (Lower Turret)	m/min	26 / 40	26 / 30	15 / 20
Z3-Axis (Sub Spindle)	m/min	40	30	20
B-Axis (Milling Spindle)	rpm	60	40	30

MAIN SPINDLE (Left Side)				
Spindle Nose		A <sub>2</sub> 6	A <sub>2</sub> 8	A <sub>2</sub> 11
Chuck Diameter	mm	210	304	380 (450)*
Spindle Bore	mm	65	77	115
Spindle Power (S1-Continuous / S6-40%)	kW	20.9 / 26.8	35	37
Spindle Torque (S1-Continuous / S6-40%)	Nm	200 / 256	585	1380
Spindle Speed	rpm	5000	4000	3300

ALTERNATIVE MAIN SPINDLE (Left Side) *				
Spindle Nose		A <sub>2</sub> 8	A <sub>2</sub> 11	A <sub>2</sub> 15
Chuck Diameter	mm	254	380 (450)*	450 (630)*
Spindle Bore	mm	77	115	145
Spindle Power (S1-Continuous / S6-40%)	kW	28.3 / 36.2	37	60
Spindle Torque (S1-Continuous / S6-40%)	Nm	300 / 384	1380	2400
Spindle Speed	rpm	4000	3300	2500

TAIL STOCK (Servo Programmable)				
Taper		MT 4	MT 5	MT 6
Tail Stock Travel	mm	1050 / 1550	1250 / 2150 / 3150	2150
Quill Dia.	mm	85	120	150



<b>SUB SPINDLE (Right Side) *</b>		<b>MTX 200</b> 1050 / 1550	<b>MTX 300</b> 1250 / 2150 / 3150	<b>MTX 400</b> 2150	
Spindle Nose		A <sub>2</sub> 6	A <sub>2</sub> 8	A <sub>2</sub> 11	A <sub>2</sub> 15
Chuck Diameter	mm	210	304	380 (450)*	450 (630)*
Spindle Bore	mm	65	77	115	145
Spindle Power (S1-Continuous / S6-40%)	kW	26.8 / 20.9	35	37	60
Spindle Torque (S1-Continuous / S6-40%)	Nm	256 / 200	585	1380	2400
Spindle Speed	rpm	5000	4000	3300	2500

<b>MILLING SPINDLE (B-AXIS)</b>				
Spindle Taper		HSK 63T	HSK 63T (CAPTO C6)*	HSK100T (CAPTO C8)*
Spindle Motor Power (S6-40% / S1 Continuous)	kW	24 / 18	26	30
Spindle Motor Torque (S6-40% / S1 Continuous)	Nm	77 / 58	125 (200)*	300
Max. Spindle Speed	rpm	12000	12000 (6000)*	6000

<b>LOWER LIVE TOOL TURRET</b>				
Number of Driven Station		12	12	12
Tool Holder Type		VDI 40	VDI 50	VDI 50
Max. Live Tool Speed	rpm	4500	3000	3000
Live Tool Motor Power	kW	4.8	8.8	8.8
Live Tool Motor Torque	Nm	31 / 20	50 / 42	50 / 42
Max. Boring Bar Dia.	mm	40	50	50

<b>MAIN TOOL MAGAZINE</b>				
Number of Tool Station		40 (80)*	40 (80, 120)*	36 (72, 108)*
Max. Tool Dia. (All / Adj. Empty)	mm	90 / 125	90 / 160	110 / 200
Max. Tool Length	mm	300	500	700
Max. Tool Weight	kg	10	15	25

<b>SUB. TOOL MAGAZINE *</b>				
Number of Tool Station		--	6	3
Max. Tool Dia.	mm	--	100	100
Max. Tool Length	mm	--	1000	1000
Max. Tool Weight	kg	--	100	100

<b>OTHER DATA</b>				
Steady Rest Max. Dia. (with Turret)*	mm	120	165	165
Steady Rest Max. Dia. (without Turret)*	mm	240	360	360
Machine Weight (approx.)	kg	10000 / 12000	18000 / 20000 / 22000	30000

\* Sub Spindle is optional in lieu of tail stock

( ) \* Optional