



PUMA *Series* **MX 2000/2500**

Multi-Axis Turning Center



Perfect Integrated Multi-Axis Turning Center

PUMA *Series*
MX 2500ST



Perfect integration of Horizontal Turning center and Machining center gives you unmatched flexibility in a wide variety of operations from the simplest general turn to mill-turn, as well as complex multi-axis mill-turn shapes in one machine. Complete addition of Y & B-axis increases remarkably the range of the machine application to the exclusive working area of machining centers.

B & Y-axis performance

B&Y-axis functional setup integrates milling jobs on incline plane and off-center point with general turning in single machine.

User oriented design

The operator panel built in front cover can swivel to most comfortable and optimal position for operator to do machine operation.



Lower Turret (MX2000/2500 T[LT],ST[LST])

Lower turret(12stations) equipped with rotary tool spindle function, increases production by aiding turning and milling jobs of B-axis Milling spindle.

Right Spindle (MX2000/2500 S[LS], ST[LST])

Stable machining of long shaft is possible by synchronous control of both spindles. Continuous process between first and second operation reduces the required cycle time.

Robust bed construction

Box type guide ways of the machine confirm high rigidity to support heavy duty multi-functional machining operations.
(Just Z1-axis is linear roller guide way)

Optimal support of automatic operation

Easy application of the machine to automated and less labor production system by various options like Gantry loader, Bar feeder and Parts unloader with conveyor.

MAIN SPINDLE *Perfect integral motor driven spindle.*

Left Spindle



Right Spindle *1



Both Left and Right spindle are designed to minimize the mal-effects of thermal distortion which can hit continuous machining precision seriously and to ensure remarkable range of applications from heavy duty cutting with high power at low speed to fine finish cutting at high speed.

*1 : on only S/ST type machine
*2 : on MX2000 series

PUMA MX2000 series

Max. spindle speed

5,000 rpm

Motor (10 min)

22 kW

PUMA MX2500 series

Max. spindle speed

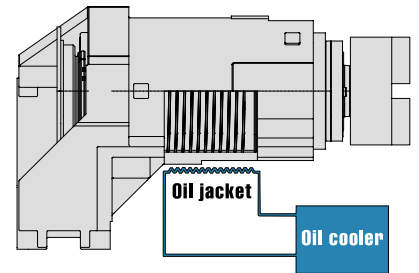
3,500 rpm

Motor (30 min)

26 kW

Oil cooling unit for Left & Right Spindles

Both left and right spindle have characteristic as integral motor spindles that are whole covered with oil cooling system to ensure remarkable range of applications from heavy duty cutting with high power at low speed to fine to finish cutting at high speed and optimize thermal displacement.



· Left spindle shown here.

Perfect C-axis control of both spindles

C1, C2-axis index

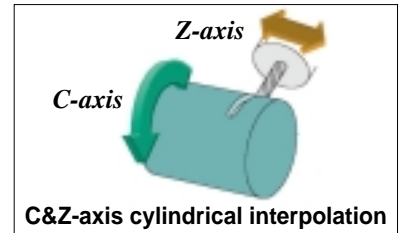
360₀ (in 0.001₀ increment)

C1, C2-axis braking torque

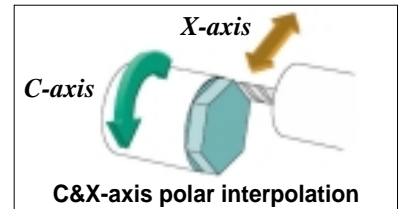
1,103 N.m

C1, C2-axis contouring torque

366^{*2} N.m



C&Z-axis cylindrical interpolation

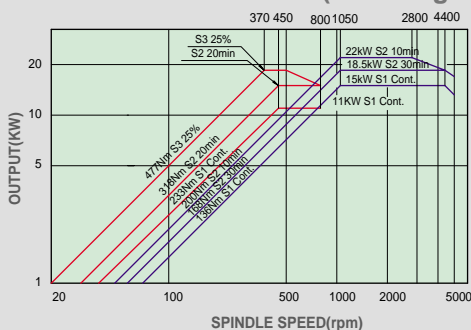


C&X-axis polar interpolation

MAIN SPINDLE POWER-TORQUE DIAGRAM

Spindle motor power : 22kW(Built-in)
Max. Spindle speed : 5,000 rpm

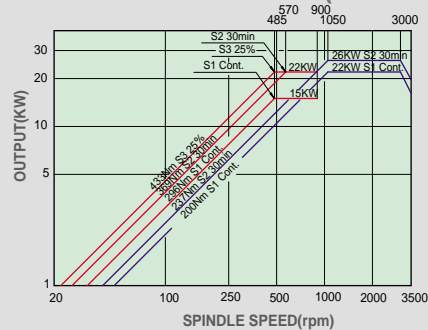
PUMA MX2000 series (Left & Right Spindle)



Right spindle is just for PUMA MX2000S [LS] / ST[LST].
PUMA MX2000 [L] / T[L] have Tail stock instead of Right spindle.

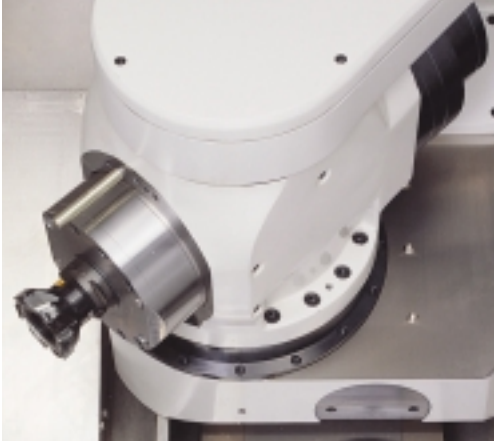
Spindle motor power : 26kW(Built-in)
Max. Spindle speed : 3,500 rpm

PUMA MX2500 series (Left & Right Spindle)



Right spindle is just for PUMA MX2500S [LS] / ST[LST].
PUMA MX2500 [L] / T[L] have Tail stock instead of Right spindle.

MILLING SPINDLE *Perfect integration of turning and milling.*



Milling spindle fully covered by oil cooling realizes the perfect integration of turning and milling jobs. The application of Multi-insert (2, 3 and 4 inserts) equipped turning tools are possible by 360 degree (in 30 degree increment) angular positioning of milling spindle itself.

Max. spindle speed

10,000 rpm

Motor (10 min)

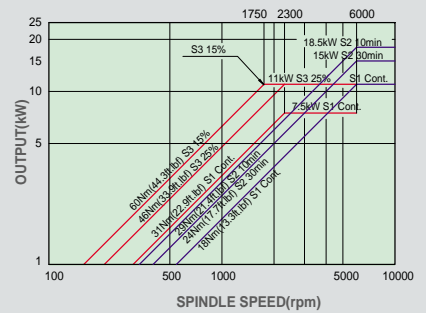
18.5 kW

**Dual contact tools
(Capto C6)**



Milling spindle power-torque diagram

Spindle motor power (10min) : 18.5kW (Built-in)
Max. Spindle speed : 10,000 rpm



TOOL MAGAZINE WITH ATC



Tool storage capacity

24 tools
[Opt:40/80]

The ATC is composed of tool magazine and change arm. All tools are returned to the pots from which they were originally taken so that collision problems involving large-sized tools need to be considered only once when they are first mounted.

Automatic tool changer (ATC)

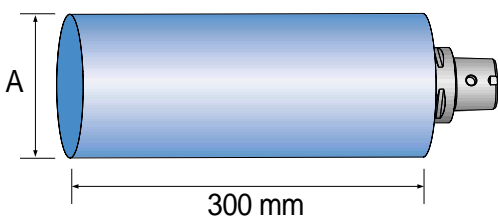
Tool change time

1.5 sec. (T-T-T)



Sophisticated mechanisms drastically reduce non-cutting time.

• **Maximum tool size**



• **Max. tool diameter (A)**

Ø90 mm
(Continuous)

Ø120 mm
(Adjacent pots are empty)

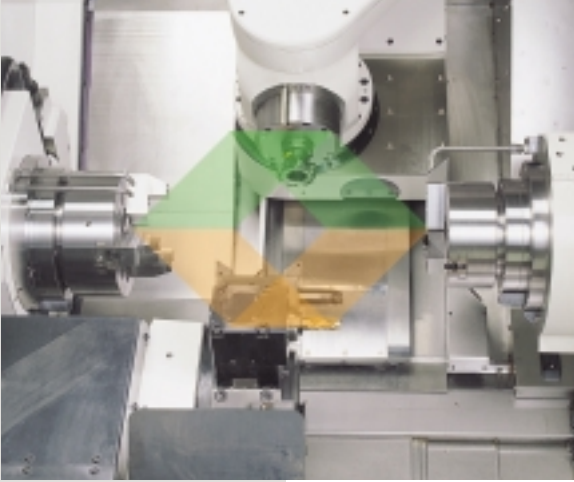
• **Max. tool length**

300 mm

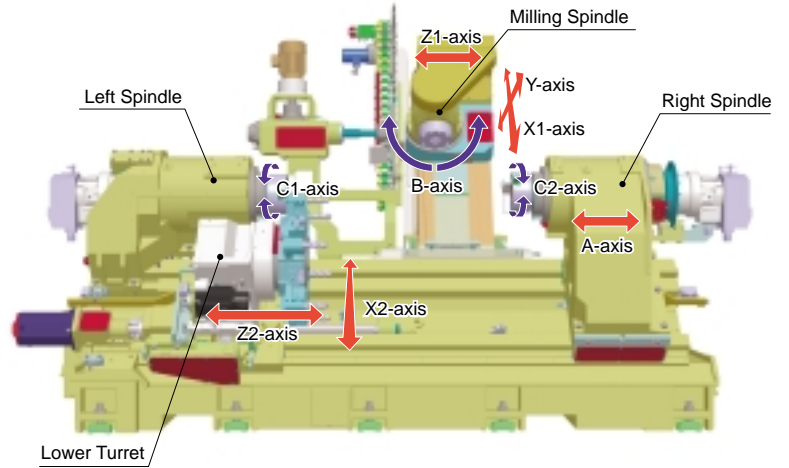
• **Max. tool weight**

8 kg

MACHINE CONSTRUCTION



Each or both Milling spindle and Lower turret can be controlled to do machining process on either spindle.



Multi-process accuracy,
Shorten setting times,
Optimal distribution of cycle and
Automated operation support



Achievement of
PUMA MX machines

AXIS FEATURES

Axis travel

X1-axis (Milling spindle)

555 mm

X2-axis*1 (Lower turret)

185 mm

Z1-axis (Milling spindle)

1,095 mm
[1,595]

Z2-axis*1 (Lower turret)

1,140 mm
[1,640]

A-axis*2 (Right spindle)

1,065 mm
[1,565]

Rapid travel

X-axis

24 m/min

C-axis

200 rpm

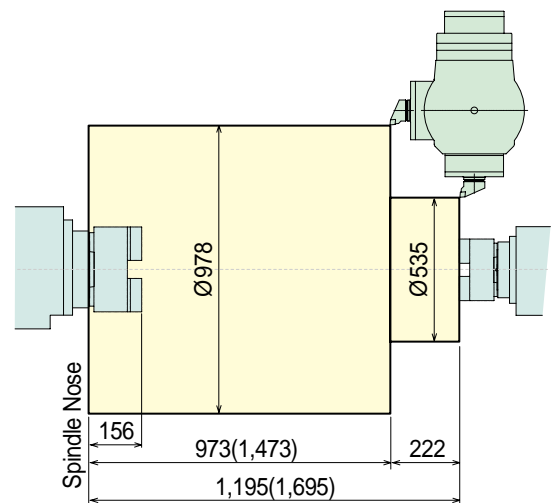
Z-axis

24 m/min

A-axis*2

24 m/min

Max. turning diameter, length

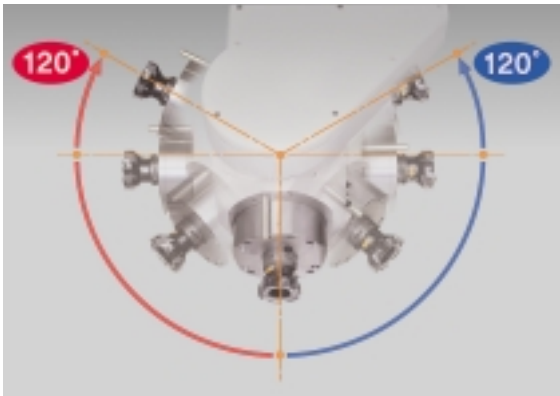


*1 : on MX2000T[LT], ST[LST] / 2500T[LT], ST[LST]

*2 : on MX2000S[LS], ST[LST] / 2500S[LS], ST[LST]

B-AXIS WITH VIRTUAL Y-AXIS

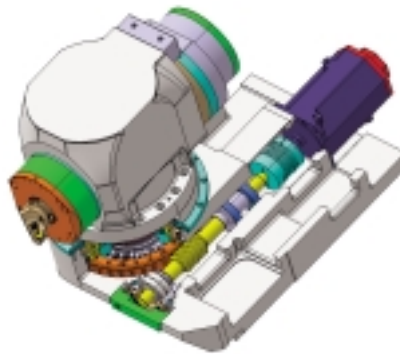
B-axis rotating range



Precise indexing control of B-axis makes milling jobs on inclined plane possible.

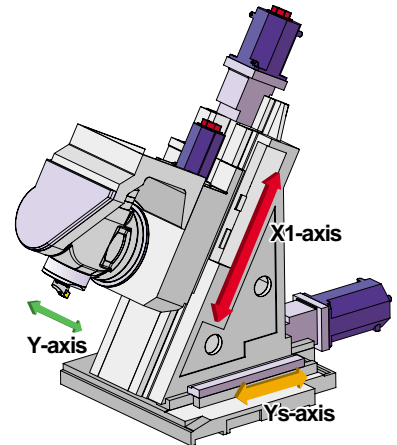
- 15, indexing (by coupling and hyd. brake clamp)
- 0.001, indexing (just hyd. brake clamp)

Precision control mechanism of B-axis



Angular position of B-axis is controlled precisely by dual lead worm gear and servo motor with 3 pieces curvic coupling.

Virtual Y-axis function

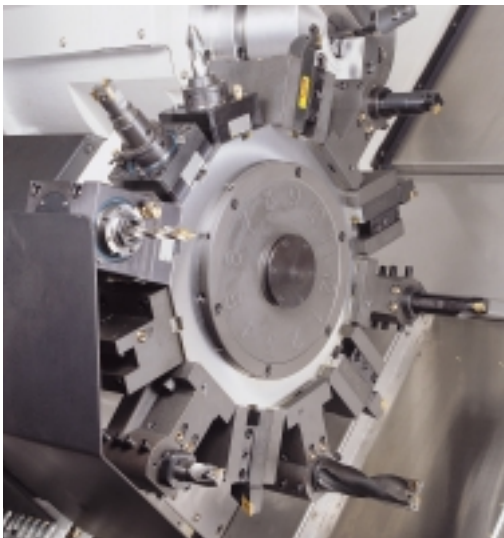


A rigid, double-slide Y-axis construction to withstand the cutting forces generated by heavy duty turning and milling.

B-axis rotation range $\pm 120^\circ$
 B-axis indexing time **2 sec. (90°)**

Y-axis stroke **160 mm**
 $\langle \pm 80 \text{ mm} \rangle$
 Y-axis rapid traverse **16 m/min**

LOWER TURRET*1



The large 12 station heavy duty turret features a large diameter Curvic coupling and heavy duty design with unsurpassed rigidity. Turret rotation, acceleration and deceleration are all controlled by a reliable high torque servo motor. Unclamp and rotation are virtually simultaneous. Its fast index response reduces the total cycle time required to machine parts.

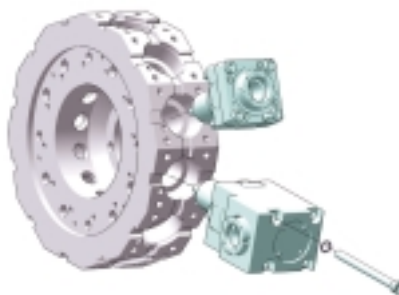
Index time (1-station swivel)

0.20 sec.

No. of tool station

12 stations

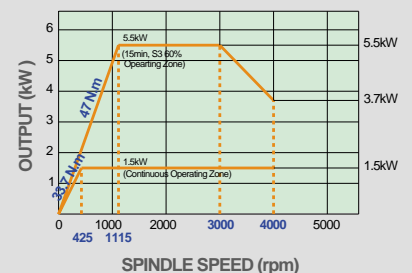
Radial BMT65P



The turret features BMT65P style tooling in which the toolholders are mounted directly to the turret's periphery using 4 large bolts. This type of mounting system allows an extremely high degree of rigidity.

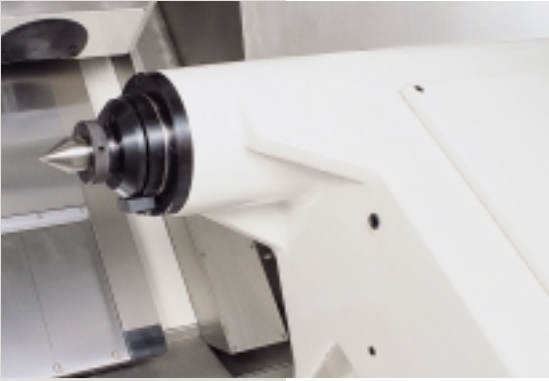
Rotary tool spindle power-torque diagram

4,000 rpm (5.5kW)



*1 : on only T/ST type machine

PROGRAMMABLE TAIL STOCK*1



Widely spaced guide ways and heavy-duty design of tailstock body ensure ample rigidity. The tailstock body is positioned by a drive bar, which engages with the carriage. The drive bar movement and hydraulic body clamping with guide way are programmable. Its built-in dead center ensures the high rotating support of workpiece.

Programmable tail stock specifications

Tail stock body travel	mm	1,015[1,375] (870[800])*2
Tail stock quill type		MT#4(Built-in dead)
Tail stock quill diameter	mm	100
Tail stock quill travel	mm	150
Tail stock quill thrust force	N	7,546 N

*1 : Programmable tail stock with built-in dead center is standard on only MX2000[L],T[LT] and MX2500[L],T[LT]

*2 : on only MX2000T[LT]/2500T[LT]

MACHINING CAPACITY

Heavy duty cutting (OD)



Spindle speed	485 rpm
Cutting speed	150 m/min
Feedrate	0.4 mm/rev

Cutting depth

9 mm

Chip removal rate

550 cm³/min

Workpiece material, KS(JIS) : SM45C(S45C), Carbon steel
The cutting test results indicated above are obtained as an example through real test cutting.
The results may not be obtained due to differences in cutting and environmental conditions during measurement.

Milling 1 (Face Milling)



Milling spindle speed	800 rpm
Tool	Ø80 mm (6Z)
Cutting depth	2.5 mm
Feedrate	480 mm/min

Milling 2 (End Milling)



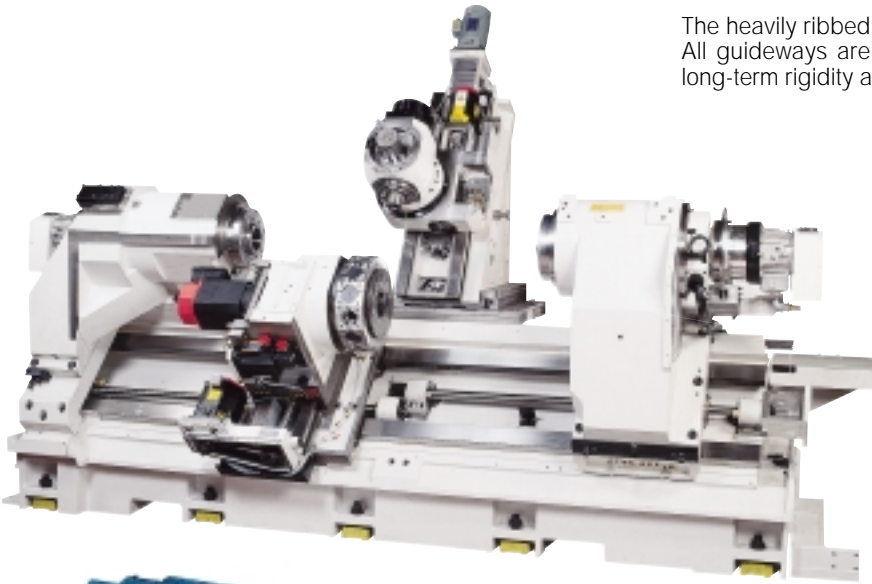
Milling spindle speed	380 rpm
Tool	Ø25 mm
Cutting depth	20 mm
Feedrate	160 mm/min

Milling 3 (Drilling)



Milling spindle speed	1,800 rpm
Tool (U-Drill)	Ø40 mm
Feedrate	0.15 mm/rev

ROBUST DESIGN *Stable base for supporting Multi-machining.*



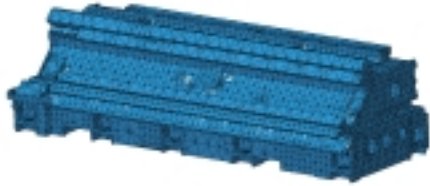
The heavily ribbed torque tube design prevents twisting and deformation. All guideways are wide wrap-around rectangular type for unsurpassed long-term rigidity and accuracy.

Rigid slant bed

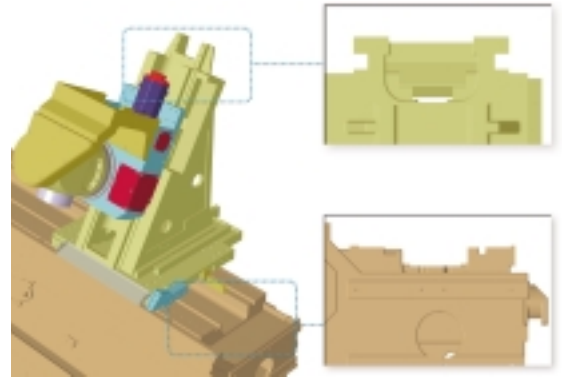
Guideway span

X1-axis **285 mm**

Z1-axis **540 mm**



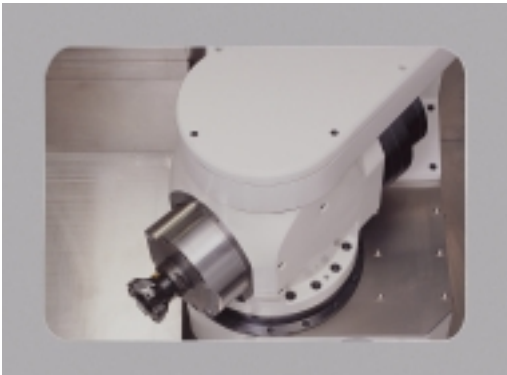
FEM analysis used to design a stable body.
(FEM : Finite Element Method)



ERGONOMIC DESIGN *Carefully tailored ergonomic operating environment.*

Safety & Operability

Safety window on front door



Viewing window is designed and was tested under heavy condition to protect operator against possible dangers during real cutting thanks to its shock absorbing laminated glass and double panel construction.

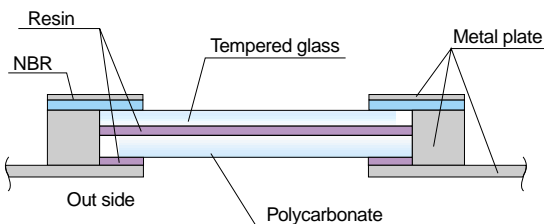
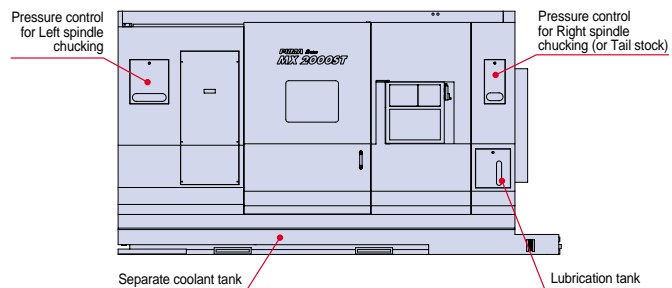
The window without grating also provides a clear view of the machine inside.

Swivel type operator panel



Operator oriented design with 90° swivel

High maintainability



OPTIONAL EQUIPMENTS



Tool magazine 40/80 tools



Oil mist collector



Air+Oil mist

Misting device

Minimum quantity lubrication(MQL) system



Oil skimmer



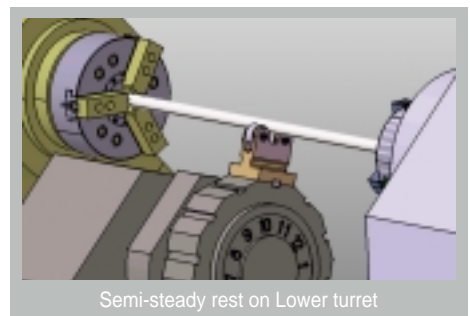
Chip conveyor



Tool setter(Hydraulic type)



Servo driven steady rest (auto centering)



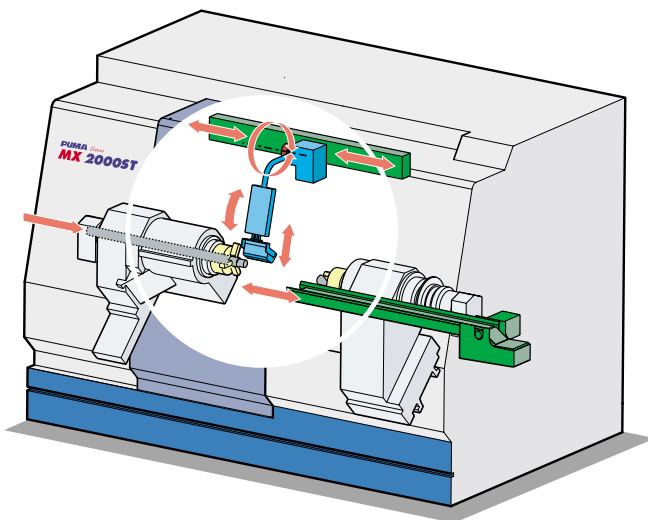
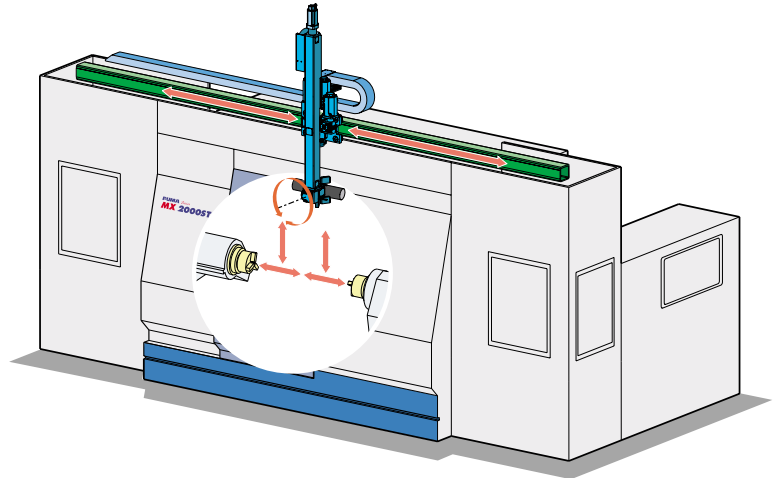
Semi-steady rest on Lower turret

OPTIMAL SUPPORT SYSTEM OF AUTOMATIC OPERATION (OPTION)

Gantry loader application

MX series can be integrated perfectly with a high-speed gantry loader to increase productivity in both short and long production runs.

Max. work diameter	Ø250mm
Max. work length	240mm
Max. work weight	30kg
Max. speed of Y-axis	56m/min
Max. speed of Z-axis	120m/min
Number of pallets	14 stations
Stack height	450mm



Parts unloader & conveyor

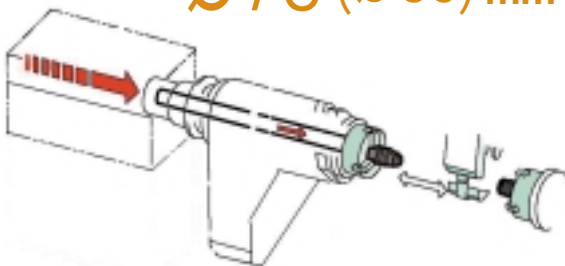
Parts unloader system built inside the machine can receive workpieces from both spindles. Automated operation is realized perfectly when the system is coupled with bar feeder system.

Max. work diameter	Ø76mm
Max. work length	170mm
Max. work weight	4kg

Bar feeder system

Automated bar working is possible by bar feeder system. When parts unloader system is added, its value of use will be in the best.

Max. Bar Working dia
Ø76 (Ø65)^{*1} mm



*1: on MX2000 series

Note) Depending on the chuck and cylinder spec. used in the machine, the bar working dia. can be reduced.

EASY OPERATING SYSTEM



Easy operating system has designed operation the many different machine in our products. We has supplied ease operation and high reliability with user-friendly interface to customer production lines.

Standard Features

High compact CNC is realized through LCD display with integrated CNC and a flash memory card interface is standard features.

Provides many support functions for set-ups, such as tool measurement, workpiece measurement at the original point, and workpiece measurement inside the machine.

Uses one display screen to perform all operations including programming, checking by animation, and real machining.

User-Friendly Operation : Soft key Selection of Comprehensive Cycle Library

● Guide for machining preparation

In preparation for machining, simple instructions on a selected screen allow to measure the setting error of workpiece and tool offset value for automated adjustment.



● Easy operation system

One single screen provides handy operation guidance for programming through machine operation.



For machining center, turning center and compound machine with milling and turning.

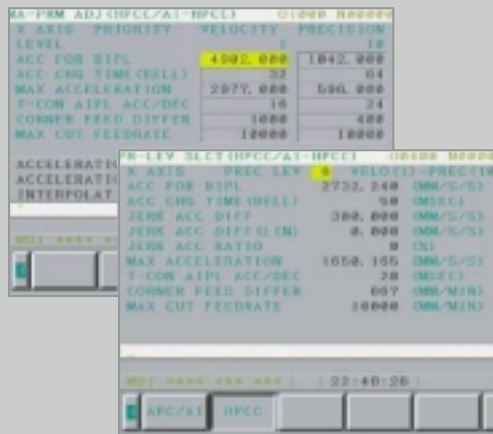
Solid modeling provides high speed animation.

Icon menu soft-keys provide convenient programming for sophisticated milling and turning.

Measurement cycles provide automatic offset measurement of workpiece (Available for machining center and for compound machine).

● Machining condition selecting function

One single screen provides convenient operation & parameter setting for high speed and high precision machining instructions.



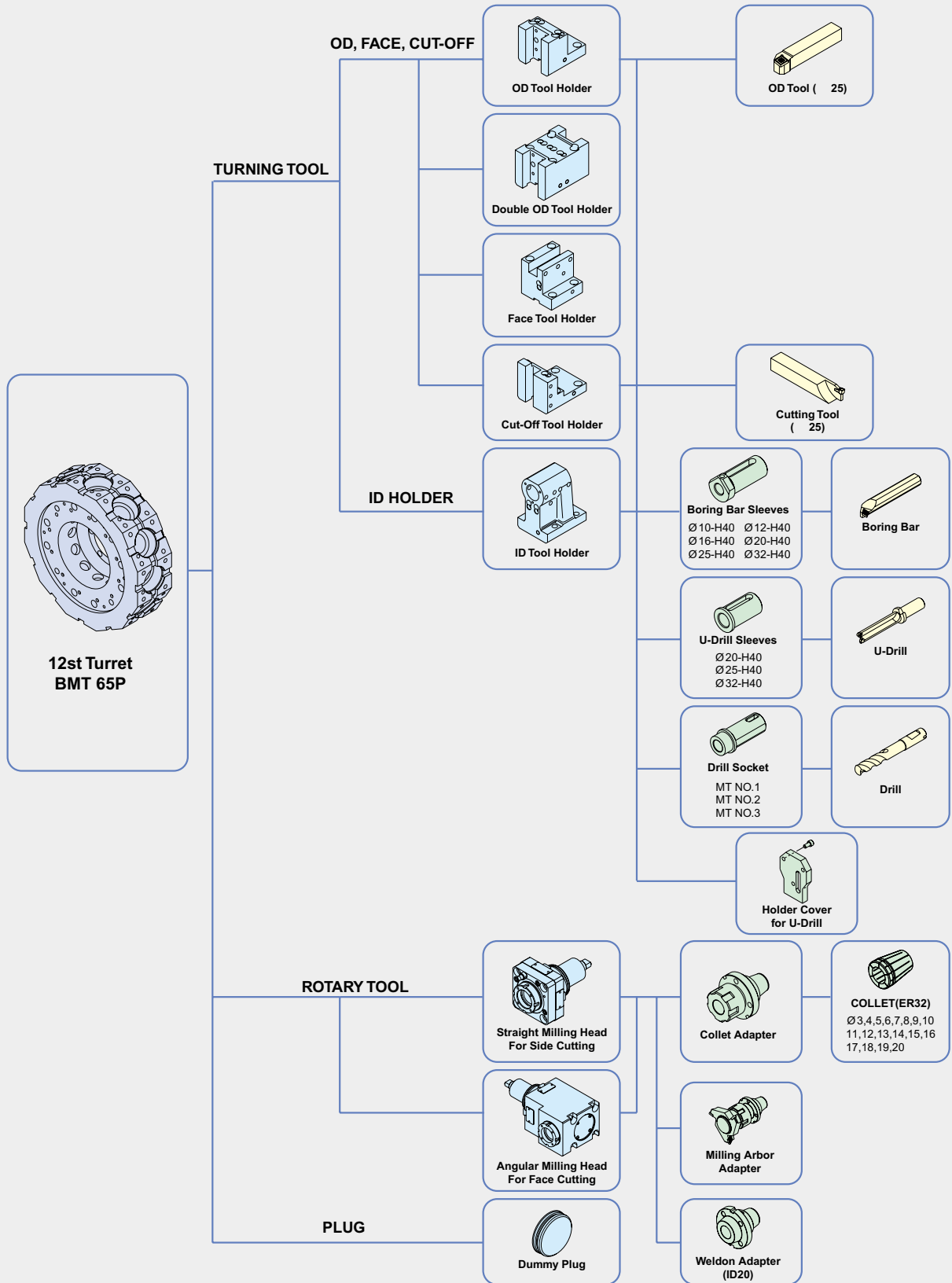
Registration of parameter sets for high speed machining and/or for high precision machining with machine configurations.

Instruction of precision level for desired machining selects appropriate parameters automatically.

Precision level can be instructed through NC program.

TOOLING SYSTEM (Lower turret*1)

unit : mm



*1 : on only T/ST machines

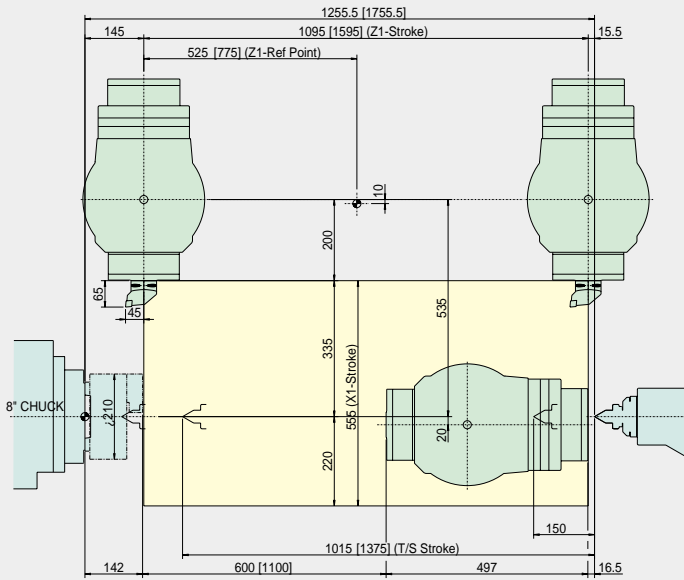
Note) Above tooling system is our recommendation.

Depending on export condition, the standard tooling packed with the machine can be different.

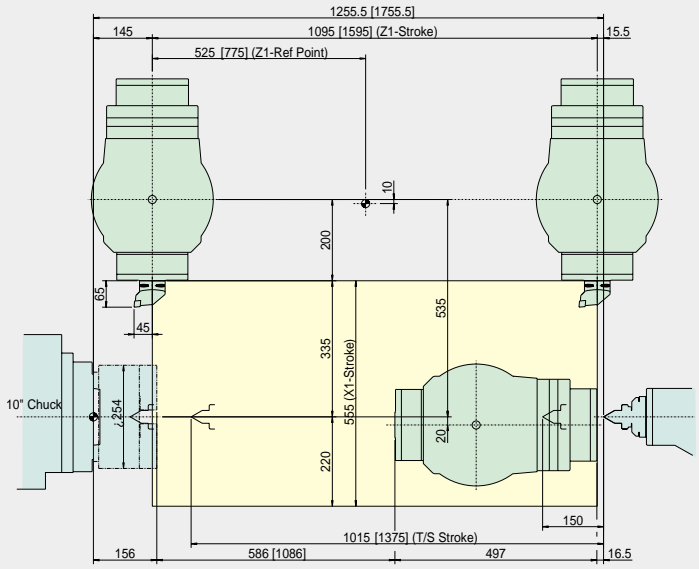
MILLING SPINDLE WORKING RANGE

unit : mm

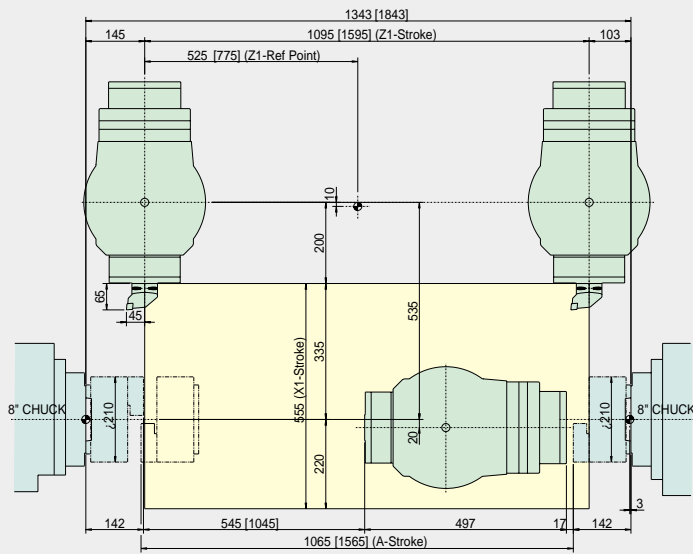
PUMA MX2000[L]



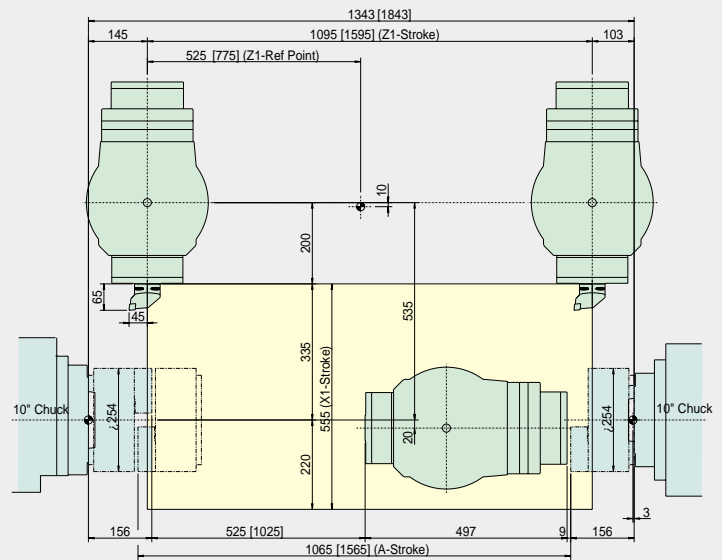
PUMA MX2500[L]



PUMA MX2000S[LS]



PUMA MX2500S[LS]



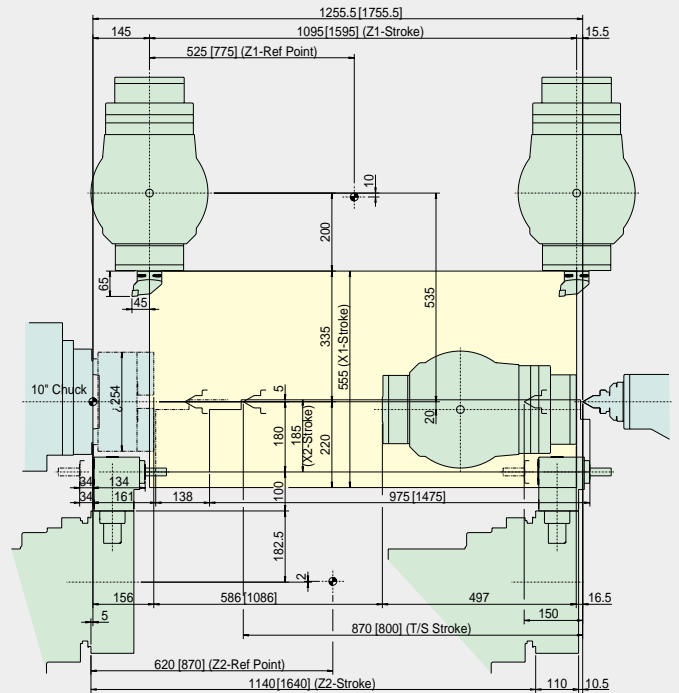
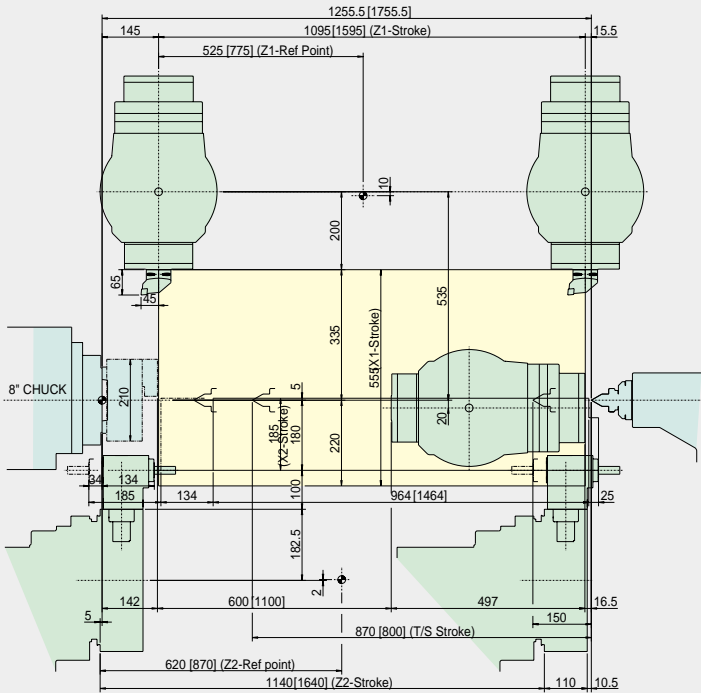
[] : Long bed

MILLING SPINDLE WORKING RANGE

unit : mm

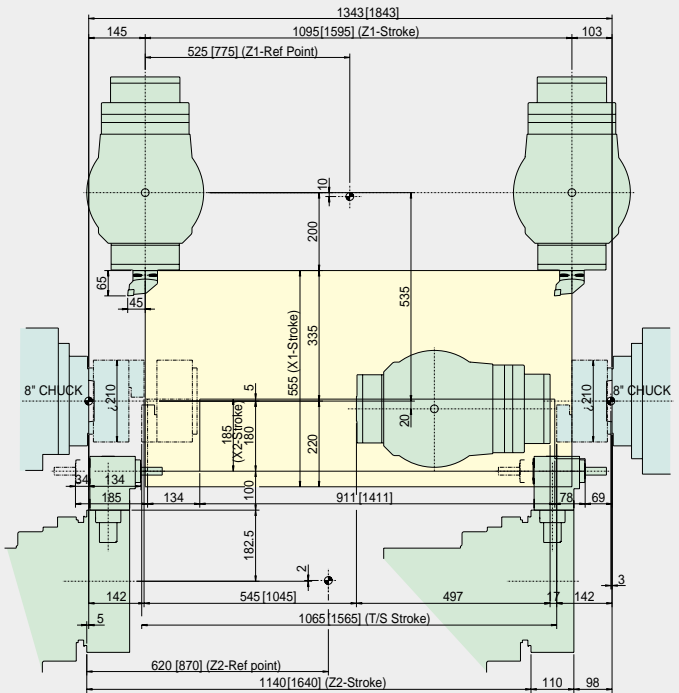
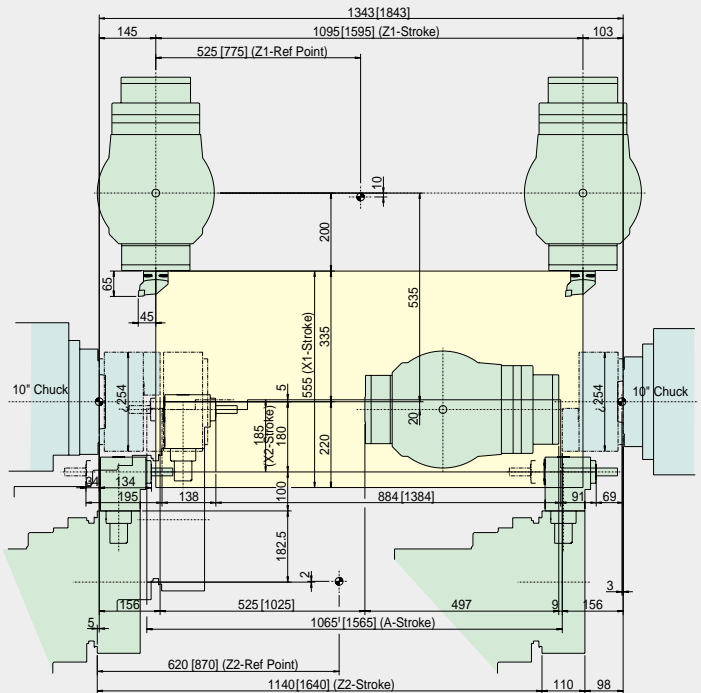
PUMA MX2000T[LT]

PUMA MX2500T[LT]



PUMA MX2000ST[LST]

PUMA MX2500ST[LST]



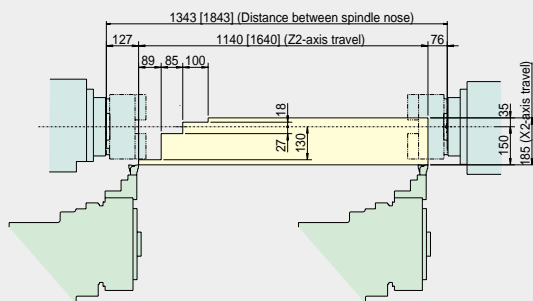
[] : Long bed

LOWER TURRET WORKING RANGE

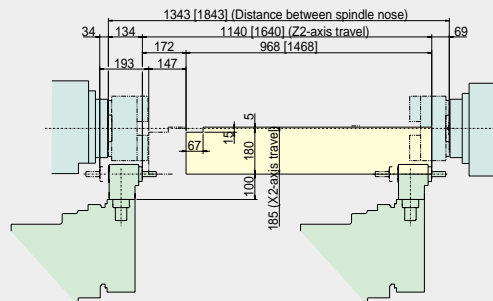
unit : mm

PUMA MX2000ST[LST] / 2500ST [LST]

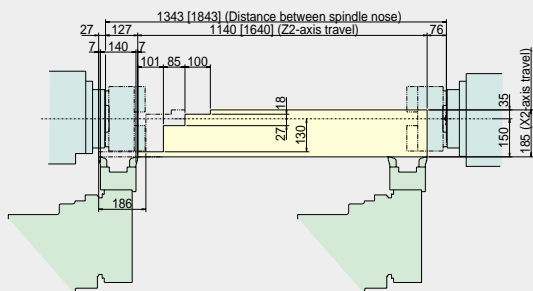
Single OD Tool holder



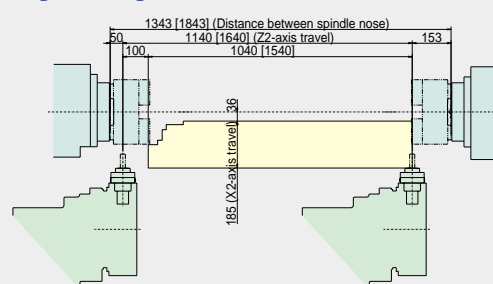
Angular milling unit



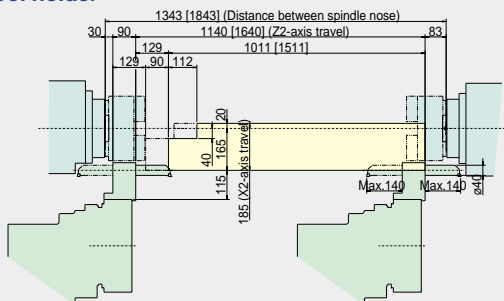
Double OD Tool holder



Straight milling unit

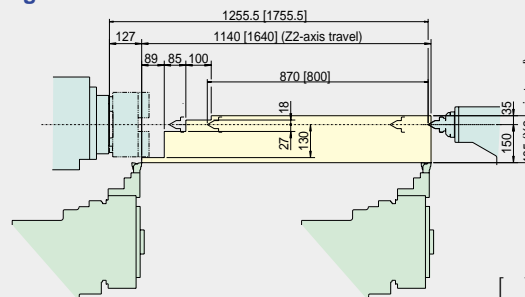


ID Tool holder



PUMA MX2000T[LT] / 2500T[LT]

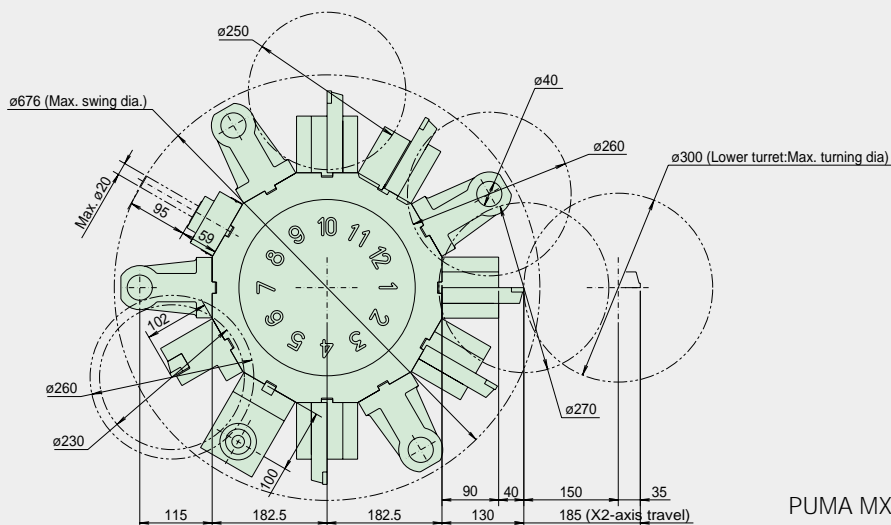
Single OD Tool holder



[] : Long bed

LOWER TURRET TOOL INTERFERENCE DIAGRAM

unit : mm

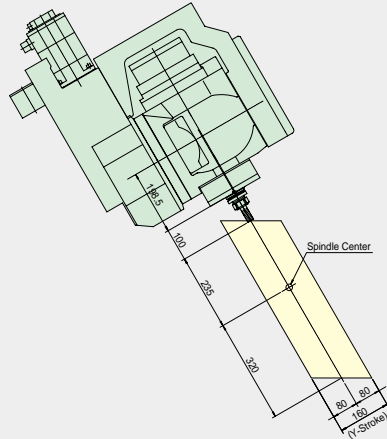
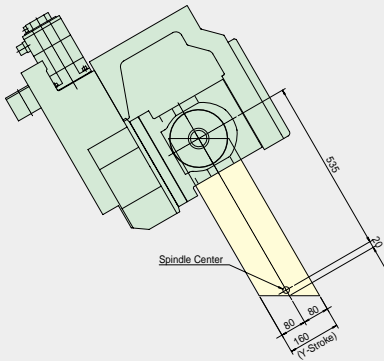


PUMA MX T, ST type machine

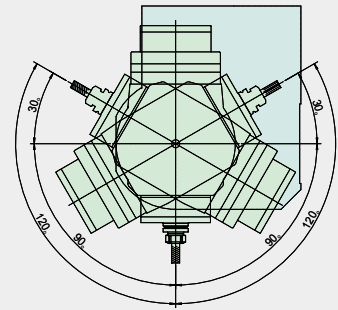
B-AXIS, Y-AXIS WORKING RANGE

unit : mm

Y-axis working range



B-axis rotating range

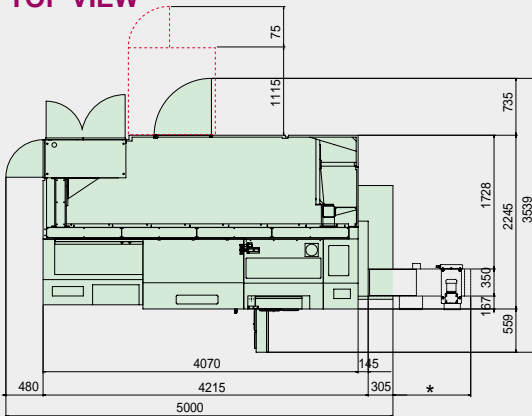


EXTERNAL DIMENSIONS

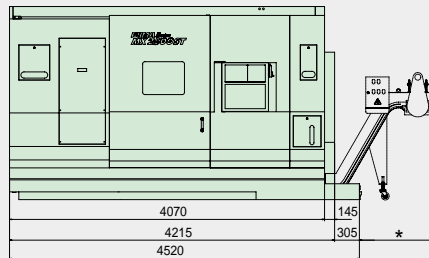
unit : mm

PUMA MX2000 / MX2500 T/S/ST

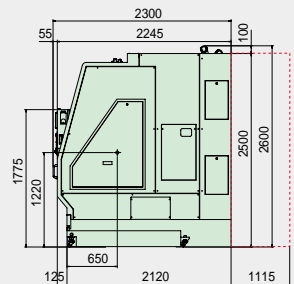
TOP VIEW



FRONT VIEW



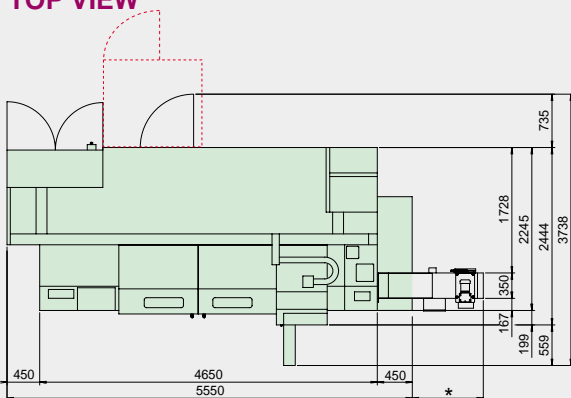
SIDE VIEW



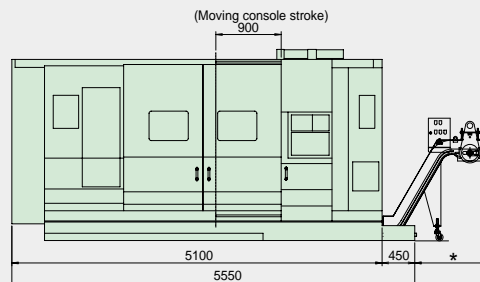
* : This dimension can be changed on the set-up condition of chip conveyor.

PUMA MX2000 / MX2500 LT/LS/LST

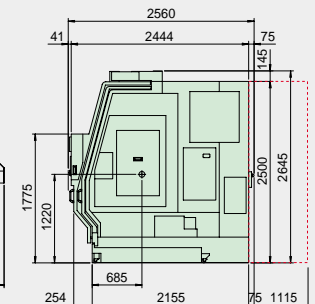
TOP VIEW



FRONT VIEW



SIDE VIEW



Note) Dotted color line means 80 tools magazine with the machine.

* : This dimension can be changed on the set-up condition of chip conveyor.

MACHINE SPECIFICATIONS

Item		PUMA MX2000/2500[L]	PUMA MX2000/2500T[LT]	PUMA MX2000/2500S[LS]	PUMA MX2000/2500ST[LST]	
Capacity	Max. turning diameter	mm	540			
	Max. turning length	mm	1,020 [1,520]			
	Bar working diameter	mm	65 / 76			
Travel	X1/2-axis travel	mm	555 / -	555 / 185	555 / -	555 / 185
	Y-axis travel	mm	160 (± 80)			
	Z1/2-axis travel	mm	1,095[1,595] / -	1,095[1,595] / 1,140[1,640]	1,095[1,595] / -	1,095[1,595]/1,140[1,640]
	A-axis travel	mm	-			1,065[1,565]
Left Spindle	Spindle speed	rpm	5,000 / 3,500			
	Spindle nose	ASA	A2#6/A2#8			
	Spindle bearing diameter(front)	mm	110 / 130			
	Spindle bore diameter	mm	76 / 90			
	Cs spindle index angle	deg	360(0.001)			
Prog. Tail stock	Chuck size	inch	8 / 10			
	Quill dia./ travel	mm	100 / 150			
Right Spindle	Quill bore taper	MT#	MT#4 (Built-in dead)			
	Spindle speed	rpm	-			5,000 / 3,500
	Spindle nose	ASA	-			A2#6 / A2#8
	Spindle bearing diameter(front)	mm	-			110 / 130
	Spindle bore diameter	mm	-			76 / 90
	Cs spindle index angle	deg	-			360(0.001)
	Chuck size	inch	-			8 / 10
Milling Spindle	Milling spindle speed	rpm	10,000			
	B-axis indexing	deg	240 (± 120), 0.001			
Tool post (Lower)	No. of tool station		-	BMT65P, 12st	-	BMT65P, 12st
	OD tool size	mm	-	25	-	25
	Boring bar diameter	mm	-	40	-	40
	Indexing time	sec	-	0.2	-	0.2
	Rotary tool spindle speed	rpm	-	4,000	-	4,000
Feedrates	Rapid traverse(X/Z/Y/A-axis)	m/min	24 / 24 / 16 / -		24 / 24 / 16 / 24	
Automatic Tool Changer	Tool shank		CAPTO-C6, KM63UT* HSK-A63*			
	Tool storage capacity		Cam 24 {Cam 40,80}			
	Max. tool diameter	mm	90			
	Max. tool diameter without adjacent tools	mm	120			
	Max. tool length	mm	300			
	Max. tool weight	kg	8			
	Tool selection method		Fixed address			
Motor	Tool change time(tool to tool)	sec	1.5			
	Left spindle motor	kW	22/26			
	Right spindle motor	kW	-		22/26	
	Milling spindle motor(30 min)	kW	15			
	Rotary tool spindle motor(15 min)	kW	-	5.5	-	5.5
	Servo motor (X, Z, Y, B, A-axis)	kW	X1:4, Z1:4, Y:3, B:1.6	X1:4, Z1:4, X2: 3, Z2: 4, Y:3, B:1.6	X1:4, Z1:4, Y:3, B:1.6, A:4	X1:4, Z1:4, X2: 3, Z2: 4, Y:3, B:1.6, A:4
	Coolant pump(Milling spindle/Lower turret)	kW	2.2	2.2 / 0.9	2.2	2.2 / 0.9
Power source	Electric power supply(Rated capacity)	kVa	43.2 / 55.9	50 / 62.6	58.7 / 83.5	60.1 / 85.4
	Machine height	mm	2,600			
Machine size	Machine dimensions	length	4,520[5,500]			
		width	2,300[2,565]			
	Machine weight	kg	11,500[13,500]	12,000[15,000]	12,000[15,000]	12,500[15,500]

Note) * : This is standard selection instead of CAPTO-C6 tool shank, { } : option

Standard Feature

Absolute positioning coder	Full enclosure chip and coolant shield	Hydraulic power unit	Soft jaws (total)
Air blast for chuck jaw cleaning	Hand tool kit	Levelling jack screw & plates	Spindle oil cooling unit
Coolant supply equipment	(including small tool for operations)	Lubrication equipment	Tail center (Programmable built-in dead)
Foot switch	Hyd. chuck & actuating cylinder	Manuals	Through Spindle coolant (Milling spindle)
Front guard door inter lock		Safety precaution name plates	Work light

Optional Feature

Air gun	Bar puller	Oil skimmer	Tool monitoring system
Automatic door	Chip conveyor	Pressure switch for chucking pressure check	Tool pre-setter (hydraulic type)
Automatic door with safety device	Chip bucket	Parts unloader and conveyor	Linear scale (X1/Y/Z1-axis)
Automatic power off	Coolant blower	Signal tower (yellow, red, green)	Minimum Quantity Lubrication (MQL)system
Automatic measuring system (in process touch probe)	Dual chucking pressure	Special chucks	Controller : Fanuc 16i-TB
Bar feeder interface	Hardened & ground jaws	Through the spindle coolant (Left or Right spindle)	(To fulfill simultaneous control of 5 axes)
	Oil mist collector		

NC UNIT SPECIFICATIONS (FANUC 18i-TB)

AXES CONTROL	
- Controlled path	1 path / 2 path(T, ST machine)
- Controlled axes : X1, Z1, C1, Y, B, A(!,!!!), X2(!,!!!), Z2(!,!!!), C2(!,!!!)	
- Simultaneous controlled axes	4 axes
- Angular axis control	
- Axis control by PMC	
- Backlash compensation	0~ ± 9999 pulses
- Backlash compensation for each rapid traverse and cutting feed	
- Chamfering on/off	
- Cs contouring control	
- Fine Acc & Dec control	
- Follow-up	
- High speed HRV control	
- Interlock & Machine lock	All axis / each axis
- Least input command	0.001mm / 0.0001
- Mirror image	
- Position switch	
- Stored pitch error compensation	
- Stored stroke check 1	
- Unexpected disturbance torque detection function	
OPERATION	
- Automatic operation(memory)	
- Buffer register	
- Dry run / Single block / JOG feed	
- Handle incremental feed	X1, X10, X100
- Manual intervention and return	
- Manual reference position return	
- MDI operation	
- Search function	Program number, Sequence number
- Tool direction handle feed	G68.1
INTERPOLATION FUNCTIONS	
- 1st. reference position return	Manual, G28
- 2nd. reference position return	G30
- 3rd/4th reference position return	
- Balance cutting(Only for 2 path)	
- Circular interpolation	G02, G03
- Continuous thread cutting	
- Cylindrical interpolation	
- Dwell (per sec)	G04
- Linear interpolation	G01
- Multiple threading / Thread cutting retract	
- Polar coordinate interpolation	G12.1, G13.1
- Positioning	G00
- Reference position return check	G27
- Skip	G31
- Super imposed control B	
- Syncro/Composition control	
- Thread cutting / Synchronous cutting	
FEED FUNCTION	
- Automatic acceleration / deceleration	
- Cutting feedrate clamp	
- Feed per minute	G98
- Feed per revolution	G99
- Feedrate override (10% unit)	0 - 200%
- Jog feed override (10% unit)	0 - 2,000mm/min
- Override cancel	
- Rapid traverse override	F0, 25, 100%
- Tangential speed constant control	
AUXILIARY / SPINDLE SPEED FUNCTION	
- 1st spindle orientation	
- 3rd spindle orientation	S/ST type machine
- Constant surface speed control	
- High speed M/S/T interface	
- M - code function	M3digits
- Multi spindle control	
- Rigid tapping / 3D rigid tapping	
- S - code function	S4 / S5 digits
- Spindle serial output	S4 / S5 digits
- Spindle speed override	0 - 150%
- Spindle synchronous control	S/ST type machine
PROGRAM INPUT	
- Absolute/incremental programming	
- Addition of custom macro common variables #100~#199,#500~#999	
- Automatic coordinate system setting	
- Canned cycle for drilling and turning	
- Chamfering / Corner R	
- Circular interpolation by R programming	
- Coordinate system setting	G50
- Coordinate system shift	
- Custom macro B	
- Diameter/radius programming(X axis)	
- Direct drawing dimension programming	
- Direct of coordinate system shift	
- G code system A	
- Input unit 10 time multiply	
- Macro executor	
- Manual absolute on and off	
- Maximum program dimension	± 8digit
- Multiple repetitive canned cycle	G70 - G76
- Multiple repetitive canned cycle	

- Optional block skip	1piece
- Optional block skip (with out hardware)	9piece
- Plane selection	G17,G18,G19
- Program number	O4digit
- Program stop / end (M00, M01 / M02, M30)	
- Programmable data input	G10
- Sequence number	N5digit
- SUB program call	4 folds nested
- Tape code : ISO / EIA auto recognition	EIA RS422/ISO840
- Tape format for FANUC Series15	
- Work coordinate system	G52 - G59
- 3-Dimensional coordinate system conversion	
TOOL FUNCTION / TOOL COMPENSATION	
- Automatic tool offset	
- Direct input of offset value measured	
- T - code function	T6 + 2digits
- Tool geometry / wear compensation	Geometry & wear data
- Tool life management	
- Tool nose radius compensation	
- Tool offset	G43, G44, G49
- Tool offset pairs	400 pairs
- Tool offset value counter input	
- Y-axis offset	
EDITING OPERATION	
- Back ground editing	
- Extended part program editing	
- Number of registered programs	125EA
- Part program editing	
- Part program storage length	160m
- Program protect	
SETTING AND DISPLAY	
- Actual cutting feedrate display	
- Alarm & Alarm history display	
- Directory display and punch for each group	
- Display of spindle speed and T code at all screens	
- Display unit	10.4 Color LCD
- Multi-language display	English
- Parameter setting and display	
- PMC system	PMC-SB7
- Program name display	31 characters
- Run hours / part count display	
- Self-diagnosis function	
- Servo setting / Spindle setting screen	
- Status display & Current position display	
- Tool path graphic display	
DATA INPUT/OUTPUT	
- Ethernet function	Embedded ethernet
- External key input / External program input	
- External work number search	15points
- Reader/puncher interface	CH1.interface
- RS232C interface	
OPERATION GUIDANCE FUNCTION	
- Automatic corner override	
- EZ Guide i(Conversational Programming Solution)	
- Tool retract and recover	
- Polygon turning	
- Program restart	
OPTION	
- Advanced preview control	
- AI contour control	
- Circular threading	
- Tool monitoring system	
- Data server	Only for 1 path
- Directory display of floppy cassette	
- DNC operation(Reader/puncher interface is required)	
- DNC1 control	
- Feed forward function	
- G code system B/C	
- Helical interpolation	
- Increment system 1/10	0.0001mm / 0.00001inch
- Interruption type custom macro	
- Manual handle interruption	
- Multi step skip	
- Number of registered programs	400 / 1,000EA
- Part program storage length	1,280 / 2,560 / 5,120m
- Pattern data input	
- Reference position shift	
- Remote buffer	Only for 1 path
- Stored stroke 2 and 3	
- Stroke limit check before move	
- Symbol CAP iT	
- Tool offset pairs	999pairs
- Variable lead threading	
- Work coordinate system preset	
- Contouring control	RISC board, RISC for High speed processing High Precision Contouring Control Tool center point control of 5- axes*

* : Just on Fanuc 16i-T

! : T type, !! : S type, !!! : ST type



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