DOOSAN

PUMA SMX series

Super Multi-tasking Turning Center

PUMA SMX series

PUMA SMX2600
PUMA SMX3100 / L
PUMA SMX2600S / ST
PUMA SMX3100S / ST / LS

MACHINE GREATNESS™

PUMA SMX series

PUMA SMX series, Doosan's next generation Multi-tasking Turning Center, features high productivity, high precision and easy operation. By integrating the capabilities of multiple machines into one system, the PUMA SMX series provides best in class machining capability by using multi-tasking functions which minimize the machining time and the number of machining operations. The PUMA SMX series also provides excellent performance for high precision machining by minimizing thermal deformation and applying an accuracy control feature based on multiple thermal compensation functions. Ergonomic design considering operator convenience and efficient maintenance provides an optimal solution that meets the customer's needs.

Contents

* This image contains several options.

Higher Productivity through Powerful Multi-tasking Functions

Decreases the total processing time and number of machining operations by using a single setup. This provides excellent high speed performance for component manufacturing processes which require accurate and complex machining.

- Complex machining capabilities of left spindle, right spindle, B-axis , milling spindle and lower turret
- High-rigidity machine construction using structural analysis design
- Maximized Y-axis machining area through orthogonal design structure
- Maximize productivity through simultaneous machining

Enhanced Precision through High Accuracy Control Functions

Maintains excellent precision during long-term machining processes by minimizing the thermal deformation of the spindle and the feed axis, and maximises precision through the 0.0001° axis resolution control function.

- Minimized thermal deformation of the spindle and feed axis using oil cooler
- Adoption of Roller LM Guideways with high-rigidity and high precision
- Equipped with 0.0001° B-axis and C-axis accuracy control function

Easy and Convenient Operation through an Ergonomic Design

Features excellent maintenance as well as usability and convenience through customized functions.

- Front located tool magazine
- Side-to-side movable swiveling operation panel with adjustable height
- Convenient ATC - MAGAZINE operation panel

Basic Structure

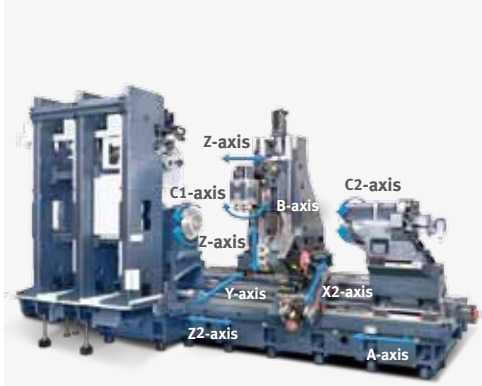
Highly Rigid Design.
All units are located on the main frame vertically for high rigidity.

Robust Design

FEM (Finite Element Method) analysis results in superior machine stability. All guideways are sealed with a protective covers, preventing high temperature chips and coolant from contacting the guideways, thus maintaining unsurpassed long-term accuracy.

Feed Axis

Extended axis travel distance and improved rapid traverse rate improve workpiece machining and provide excellent productivity. The X, Y and Z-axis move orthogonally to reflect high precision machine accuracy into machining accuracy.

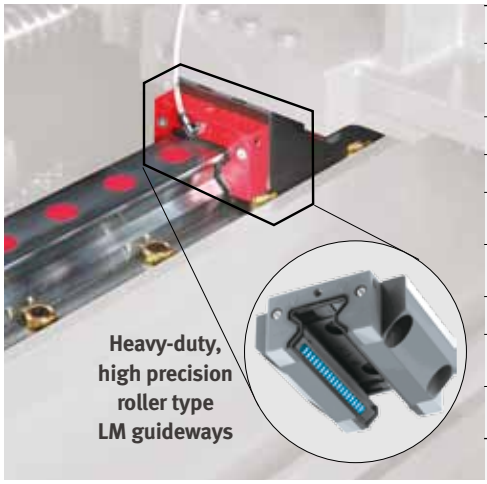


Travel			
	PUMA SMX2600/S, 3100/S	PUMA SMX3100L/LS	PUMA SMX 2600ST / 3100ST
X-axis	630 mm (24.8 inch)		695 mm (27.4 inch)
Y-axis	300 (±150) mm (11.8 (±5.9) inch)		
Z-axis	1585 mm (62.4 inch)	2585 mm (101.8 inch)	1585 mm (62.4 inch)
A-axis	1605 mm (63.2 inch)❶ 1562 mm (61.5 inch)❷	2500 mm (98.4 inch)❶❷	1538 mm (60.6 inch)❶
B-axis	240 (±120) deg.		
X2-axis	-		235 mm (9.3 inch)
Z2-axis	-		1540 mm (60.6 inch)

❶ Right spindle ❷ Servo tail stock

High Precision Roller type LM Guideways

SP class roller type LM guideways for extra load capacity and rigidity are used on all axes to enable high rapid traverse rates.



Rapid traverse rate			
	PUMA SMX2600/S, 3100/S	PUMA SMX2600ST / 3100ST	PUMA SMX3100L/LS
X-axis	48 m/min (1889.8 ipm)		
Y-axis	36 m/min (1417.3 ipm)		
Z-axis	48 m/min (1889.8 ipm)		30 m/min (1181.1 ipm)
A-axis	30 m/min (1181.1 ipm)❶		20 m/min (787.4 ipm)❶
B-axis	40 r/min		
X2-axis	-	24 m/min (944.9 ipm)	-
Z2-axis	-	36 m/min (1417.3 ipm)	-

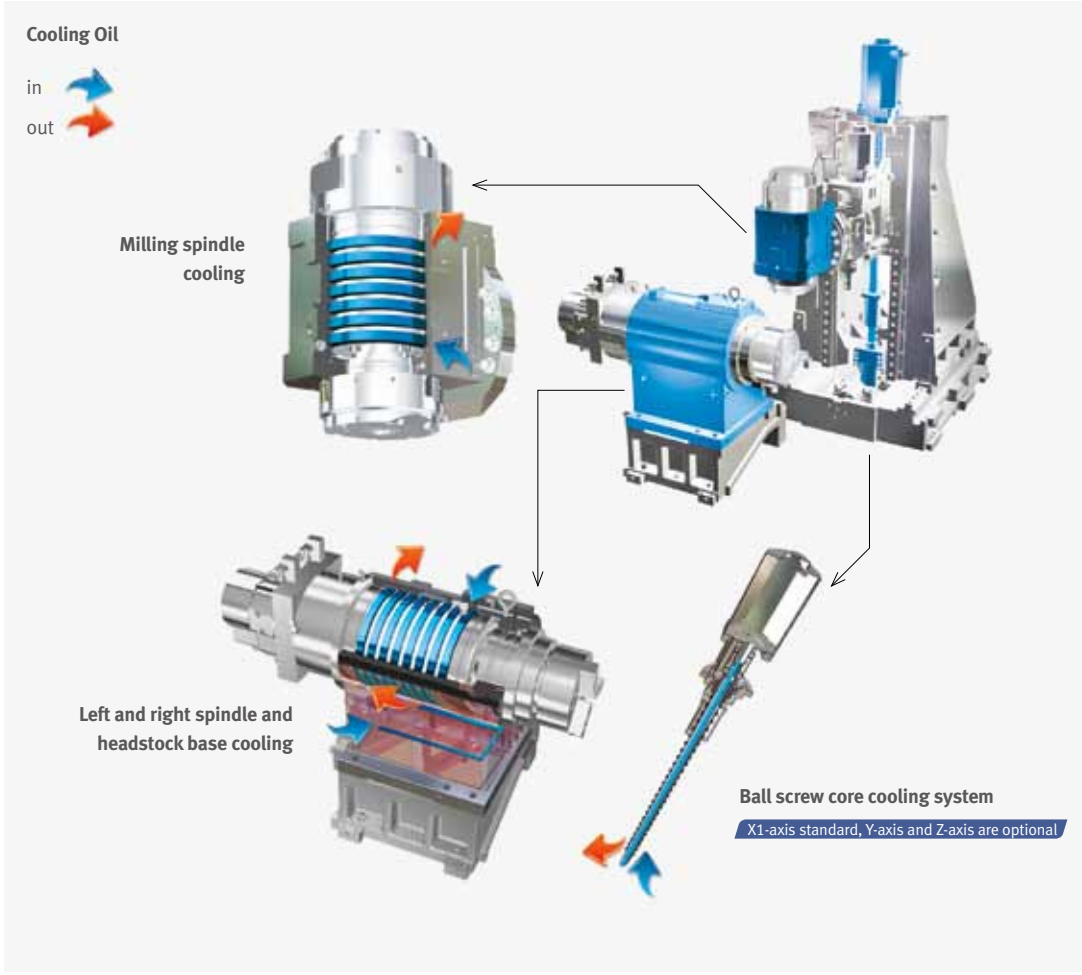
❶ Right spindle (Servo tail stock is not applicable)

Basic Cooling Concept for Higher Accuracy in a Long time Machining

Structural preparation to minimize thermal error and ensure superior accuracy for a long time operation

Minimization of Thermal Deformation by Oil Cooling

Spindle and ball screw core cooling system minimizes thermal deformation during long machining processes and enhances high accuracy performance.

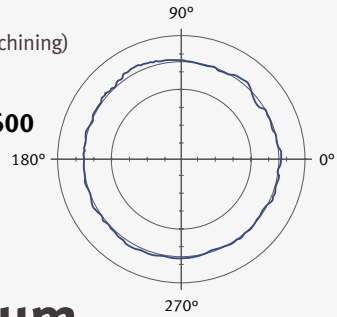


Cutting Accuracy

By performing extended test procedures of individual machine elements and detailed analysis of results, the SMX series achieves a high level of precision and reliability that fulfills customer satisfaction.

Turning (O.D. machining)

PUMA SMX2600

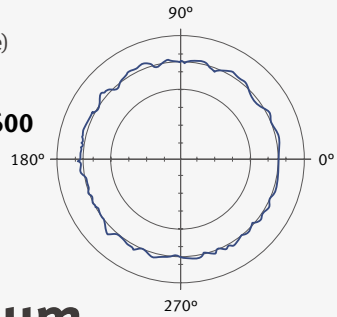


0.5 µm

Material	Aluminium
Tool	Diamond tool (Nose radius 0.5 min (0.02 in.))
Spindle speed	3000 r/min
Feedrate	0.5 mm/rev (0.02 ipr)

Milling (X-Y plane)

PUMA SMX2600



3.2 µm

Material	Aluminium
Tool	End mill Ø20 mm (0.787 in.)
Spindle speed	8000 r/min
Feedrate	2500 mm/min (98.4 ipm)

* This test is performed under Doosan Machine Tool's test environment.

Spindle

Perfect combination of 3 key spindles to ensure machining stability under various cutting conditions.

Perfect combination of key- rotation axis

Both left and right spindle are capable of high accuracy C-axis control and perform various machining functions like turning, milling and synchronized cutting using single set-up with milling spindle.

Model	Spindle	Standard Chuck (inch)	Spindle speed (r/min)	Power kW (Hp)	Torque N·m (ft-lbs)	Condition
PUMA SMX2600 series	Left Spindle	10	4000	26 / 22 (34.9 / 29.5)	700 (516.6)*	30min/cont.
PUMA SMX3100 series		12	3000	30 / 25 (40.2 / 33.5)	1203 (887.8)	30min/cont.
PUMA SMX2600S/3100S/ 3100LS	Right Spindle	10	4000	26 / 22 (34.9 / 29.5)	700 (516.6)*	30min/cont.
PUMA SMX2600ST/ 3100ST					621 (458.3)*	

* On S3 25% operation

Model	Spindle	Tool shank	Spindle speed (r/min)	Power kW (Hp)	Torque N·m (ft-lbs)	Condition
PUMA SMX2600 series	Milling Spindle	CAPTO C6	12000	26 / 18.5 / 15 (34.9 / 24.8 / 20.1)	124 (91.5)*	2.5min / 10min / cont.
PUMA SMX3100 series						

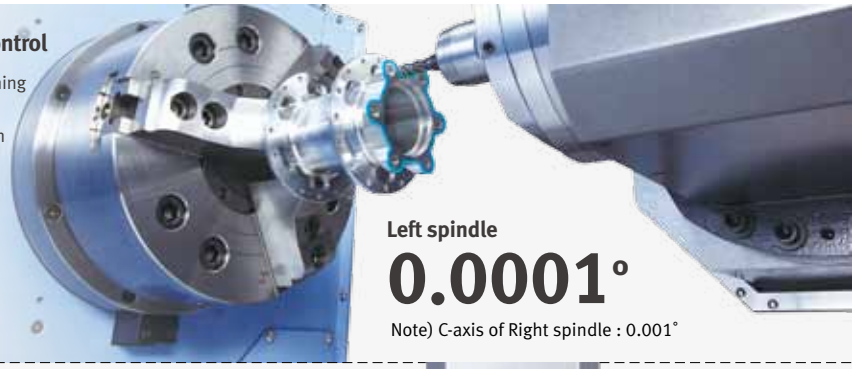
* On S3 25% operation

High Precision Control of Spindle axes (C & B-axis)

Machining operation is mainly done by Left and Milling spindle. C-axis of left spindle and B-axis of milling spindle with Y-axis control realize multi-tasking turning center that can drill, tap and end mill in any angle and also deliver the ability to cut precise angles and sculpted contours(5-axis simultaneous controlled specification is option).

C-axis positioning control

To enhance C-axis positioning accuracy of left spindle, the position compensation sensor has been adopted. Left spindle can have C-axis positioning control of every 0.0001˚ in 360˚.



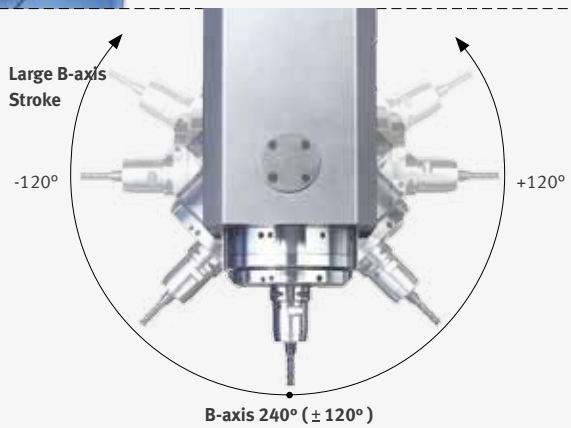
Left spindle

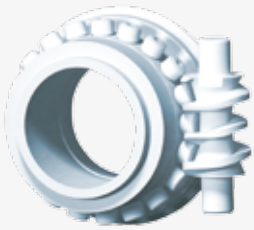
0.0001°

Note) C-axis of Right spindle : 0.001˚

B-axis positioning control
Precise continuous index

B-axis index that can have swivel positioning of every 0.0001˚ in ±120 ˚ performs not only horizontal front face machining but also angular machining.





Swivel and index ing of B-axis is by servo motor and roller gear cam with high-rigidity and high-precision

Dual pressure braking

Depends on cutting condition, braking index of B-axis can be controlled.

Braking index at a random angle

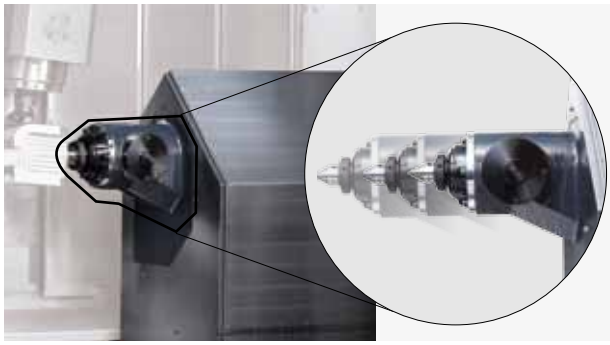
Within its swivel ±120 ˚, B-axis can be indexed and braked precisely at a random angle.

Tailstock

More easier and faster set-up of the tailstock using M-code program by servo motor and ball screw

Servo driven tailstock

Servo tailstock make part set-up faster and easier. The operator inputs the proper M-code information in the control and tailstocks move to its proper positions automatically by linear motion control of servo motor and ball screw. No manual adjustments are required.



Model	Tail stock travel mm (inch)	Max. quill thrust force kN (lbs)	Tail stock center
PUMA SMX2600 / 3100	1562 (61.5)	10 (2248.0)	Built-in type Dead center, MT#5
PUMA SMX3100L	2500 (98.4)	15 (3374.4)	

ATC Automatic Tool Changer

Servo ATC and Servo tool magazine ensuring fast and reliable tool indexing

Servo driven ATC & Tool magazine

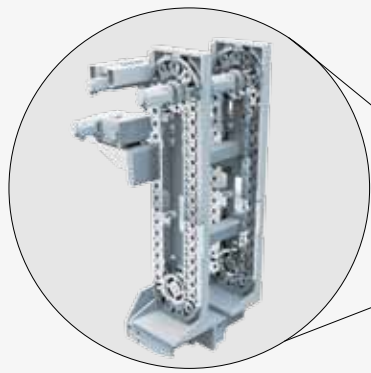
The tool magazine can be increased up to 120 tools and tools are selected by a fixed address method that follows the shorter path.

Tool storage

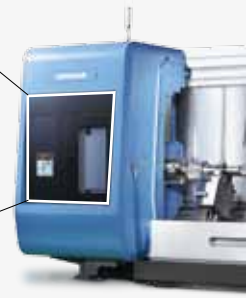
40 tools

option 80 / 120 tools*

The photo is tool magazine of 80 tools



Front located tool magazine ensuring easy tool maintenance



*120Tools ATC option is only available to PUMA SMX2600ST/3100ST.

Max. tool length (from gauge line)	450 mm (17.7 inch)
Max. tool weight	12 kg (26.5 lb)
Max. tool moment	9.8 N·m (7.2 ft-lbs)
Max. tool diameter (continuous)	90 mm (3.5 inch)
Max. tool diameter (adjacent pots are empty)	130 mm (5.1inch)

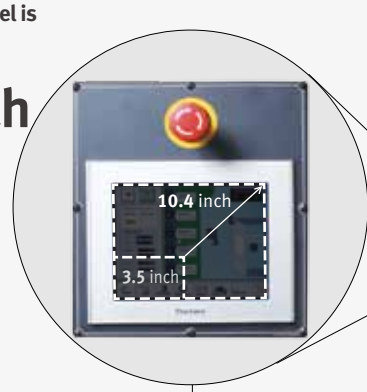
ATC-MAGAZINE Operation Panel

The status of ATC and the tool magazine unit are identified visually by using a graphic touch panel display and touch operation. The touch screen also operates the ATC, the tool magazine and the tool feed pot carrier individually.

Enlarged touch screen panel is available as an option

10.4inch

option 3.5 inch
option 10.4 inch



Display and touch operation

Displays ATC – MAGAZINE related information and supports manual operation by touchscreen. 7.5-inch large screen specification is available for the ATC – MAGAZINE operation panel.

Monitoring ATC internal status

The internal operation status of the ATC can be photographed by the camera and displayed on the screen .

Tool information display

Improves the tool management by saving and displaying useful tool related information.

Additional Tool Magazine

As option just for PUMA SMX3100L/LS, long boring bar magazine is available to ensure more easy application to long tube machining

❶ You can select tools storage capacity 2+1 tools instead of 3 tools. The 2+1 tools storage means 2 tools of Ø60 x L600 mm or Ø30 x L800 mm and 1 large diameter tools, Ø190 x L200 mm can be mounted in long boring bar magazine.

❷ Ø30 x L800 mm sized tool is not Long boring bar but Gun drill. We do not recommend long boring bar sized Ø30 x L800 mm.

Tools magazine for Long boring bar option for PUMA SMX3100L / LS

PUMA SMX3100L/LS can be equipped with long boring bar magazine as option.

Tool storage

3 tools ❶

PUMA SMX3100L/LS can accommodate workpieces as long as 2540mm between centers. The machine can process long tube such as landing gear axle requiring the center bore. Because the Automatic tool changer on this model cannot handle long boring bar, the separate tool magazine just for these tools can has 3 tool stations for tools as long as max. 600mm

Max. Tool size

Ø 60 x L 600 mm

(Ø 2.4 x L 23.6 inch)

Max. Weight

15 kg

(33.1 lb)

or

Max. Tool size

Ø 30 x L 800 mm ❷

(Ø 2.4 x L 31.5 inch)

Max. Weight

15 kg

(33.1 lb)

Turret

Strong and rigid lower turret in multi-tasking is to provide more powerful manufacturing performance and a variety of new applications.

High rigid servo driven Lower turret (only on PUMA SMX2600ST / 3100ST)

Turret rotation, acceleration/deceleration and large diameter curvic coupling are controlled by a high-torque servo motor. Unclamp and rotation are virtually simultaneous. The fast index response keeps cycle times short.

Number of Tool stations

12 ea

Tool holder type

BMT 65P

Max. Rotary Tool Speed

5000 r/min

Various applications of lower turret

Machining Area

Expands machining capacity using an orthogonal structure and enables machining of large size workpieces through the extended turning diameter.

Maximized Y-axis Mmachining Area Using Orthogonal Structure Design

Maximized Y-axis machining area because of orthogonal structure design allows the machining of a wide range of workpieces.

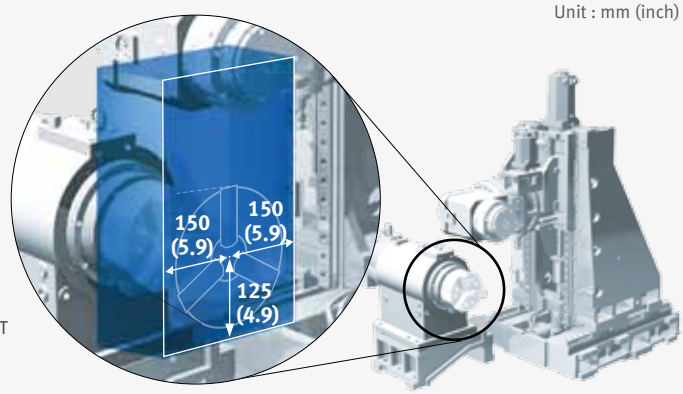
Y-axis machining area

300 mm
(11.8 inch)

X-axis :
630mm / 695*mm
(24.8 inch / 27.4 inch)

* PUMA SMX2600ST/3100ST

Unit : mm (inch)



Y-axis : **300 mm (11.8 inch)**

Extended Machining Area

The extended machining area allows machining of large diameter and long workpieces.

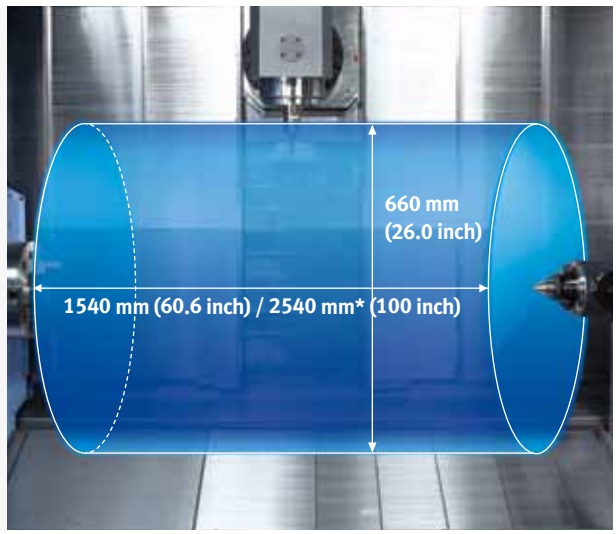
Max. machining diameter

660 mm
(26.0 inch)

Max. machining length

1540 mm
(60.6 inch)

2540 mm*
(100 inch)



* PUMA SMX3100L/LS

Large Bar Working Diameter

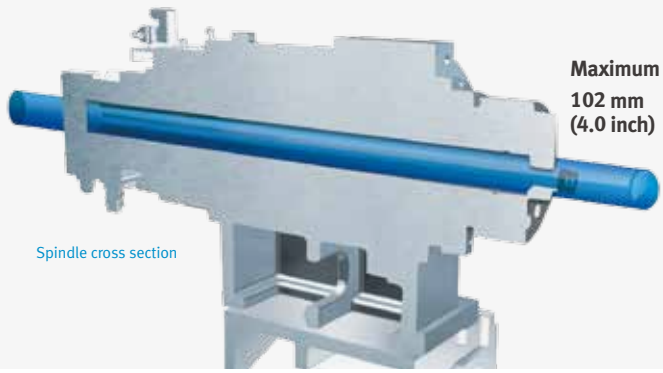
Both SMX2600 and 3100 models provide large bar diameter capacity through the spindle drawtube.

PUMA SMX2600

81 mm
(3.2 inch)

PUMA SMX3100

102 mm
(4.0 inch)



Spindle cross section

Cutting Performance

Powerful machining capability in various operation such as turning, milling and drill and tapping and multi-tasking performance ensuring more higher machining efficiency.

Powerful Machining

O.D. cutting (PUMA SMX3100)

Spindle speed r/min	Cutting speed m/min (ipm)	Feedrate mm/rev (ipr)	Radial cutting depth mm (inch)	Material removal rate cm^3/min ($inch^3$/min)
253	210 (8267.7)	0.55 (0.022)	8.5 (0.3)	1405 (85.7)

U-drill (milling)

Tool mm (inch)	Milling spindle speed r/min	Feedrate mm/min (ipm)	Material removal rate cm^3/min ($inch^3$/min)
Ø63 (2.5)	1010	131 (5.2)	409 (25.0)

Face milling

Tool mm (inch)	Milling spindle speed r/min	Radial cutting depth mm (inch)	Feedrate mm/min (ipm)	Material removal rate cm^3/min ($inch^3$/min)
Ø80 (3.1)	1100	5 (0.2)	1117 (44.0)	357 (21.8)

End milling

Tool mm (inch)	Milling spindle speed r/min	Radial cutting depth mm (inch)	Feedrate mm/min (ipm)	Material removal rate cm^3/min ($inch^3$/min)
Ø25 (1.0)	382	25 (1.0)	200 (7.9)	125 (7.6)

Tapping

Tool mm (inch)	Milling spindle speed r/min	Feedrate mm/min (ipm)
M30 x P3.5 (M1.2 x P0.1)	212	742 (29.2)

* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Higher Productivity by Multi-tasking performance

Faster machining time compared to many conventional machines provides superior productivity and machining capability.

Reduced production lead time by

75 %

Conventional machining

Machine 1 (Turning Center)
- -Setting
- -Turning
- -Remove and move workpiece

Machine 2 (Machining Center)
- -Setting
- -Conventional Milling
- -Change fixture for the angular surface machining
- -Milling for the angular surface
- -Remove and move workpiece

Machine 3 (Turning Center)
- -Setting
- -Turning

650 Minutes

Multi-tasking of PUMA SMX

SMX2600S
- -Setting
- -Turning
- -Milling
- -Automatic feed
- -Turning
- -Milling

163 Minutes

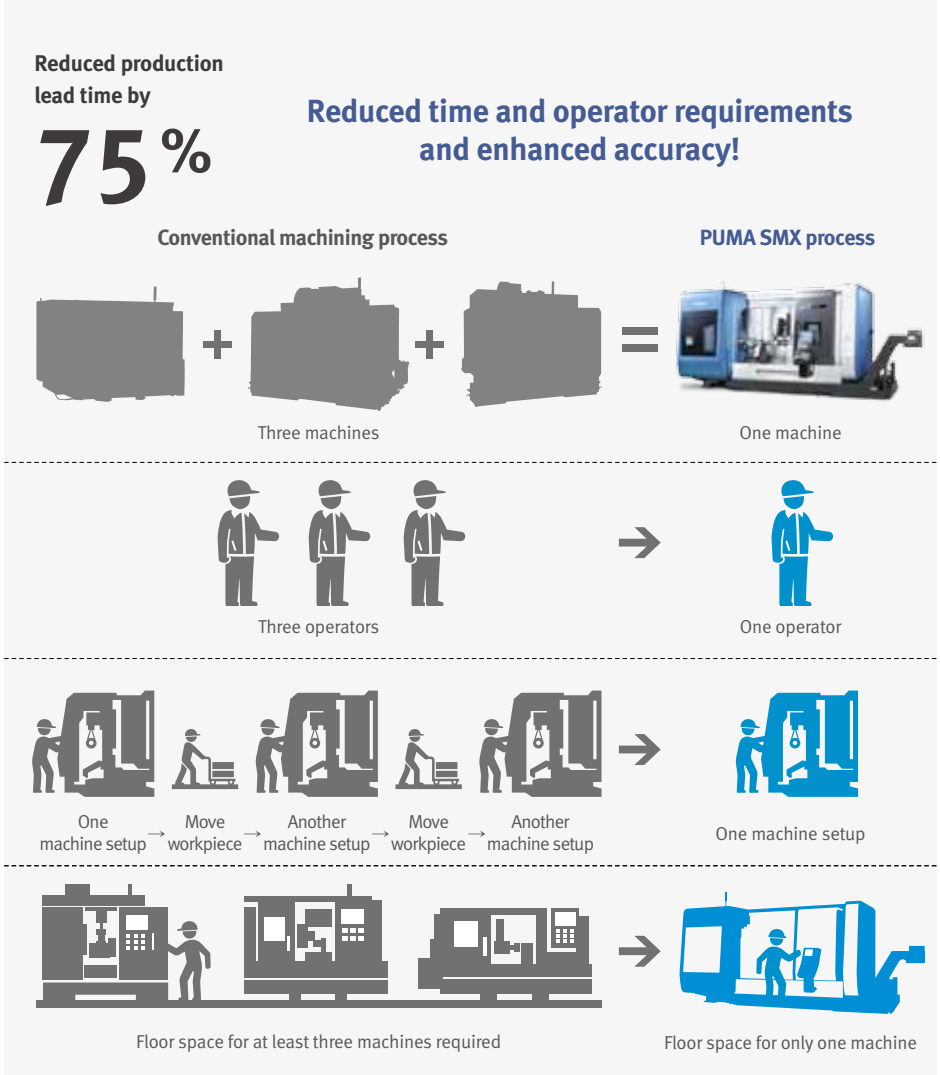
Increased work efficiency using one time setup on one machine

Application Performance

Multitasking, which is performing more than one duty at once, This can lead to as much as a 40 percent increase in productivity and can positively impact your company's bottom line.

Benefits of Multi-tasking operation

Using a single set up, one machine is capable of performing all machining processes that generally require two three or even more machines. By minimizing time and labor, the process cost is reduced and lead times are shortened by up to 75%. This provides a significant advantage when manufacturing small batches of a variety of products.

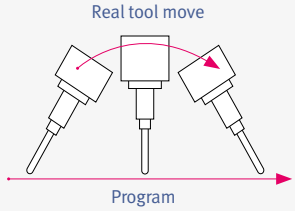


Providing 5-axis Complex Machining Capabilities (Standard when applying FANUC 31i-5)

Simultaneous 5-axis machining functions such as TCP* are built-in, thereby making the machining of complex shapes easier, such as an automotive engine impeller or an aero engine blade.

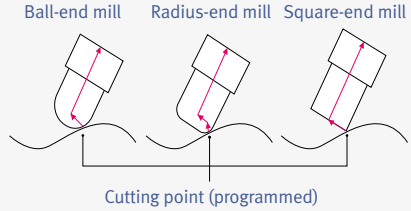
Tool Center Point Control

- Facilitating the high precision machining of the surface by automatic control of tool path
- Decreasing the time for the machining setup and the cutting process



Cutting point command option

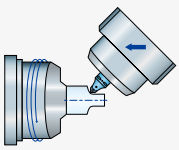
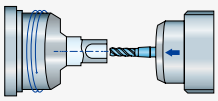
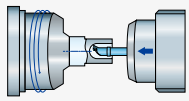
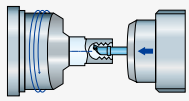
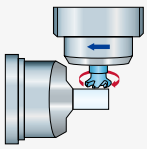
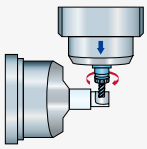
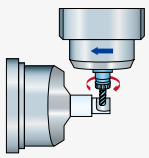
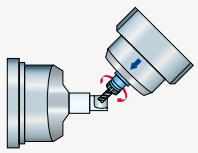
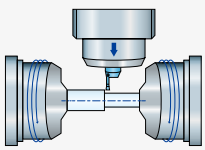
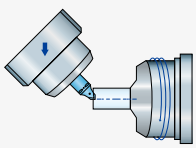
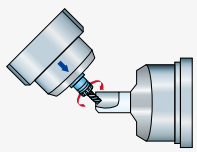
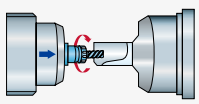
- Increasing the productivity by automatically compensating when using various tool tips without changing the machining program
- Performing effective tool correction



* TCP : Tool Center Point

Various Application

Just single machine, PUMA SMX series can meet all machining requirements. That's why, your investing in PUMA SMX series that boost your capabilities can take your operations to the highest level of performance, including your all-important return on investment.

Turning				
	O.D. cutting	U-Drilling	I.D. cutting	I.D. threading
Milling				
	O.D. milling	O.D. hole machining	Ball-end milling	Angular machining
Right spindle				
	Parting off	Face cutting	Angular machining	End face hole machining and tapping

Application Sample

Optimal Applications of High Productivity

A wide range of applications based on high productivity

Complex machining capabilities of the PUMA SMX series enable machining over a wide range of applications in various industries, such as aerospace, energy, shipbuilding, medical, etc.

Drill bits
Industry I Energy
Size I D165 X D175
Material I Stainless steel
Tools I 15

Shaft
Industry I General
Size I D150 X L350
Material I Aluminum
Tools I 14

Die roller
Industry I Medical
Size I D185 X L330
Material I Aluminum
Tools I 9

Valve
Industry I General
Size I D300 X L450
Material I Stainless steel
Tools I 6

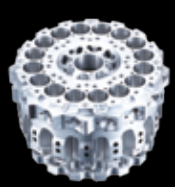
Optimal Applications of Accuracy

Wide range of workpieces based on high precision

Stable control technology and excellent level of accuracy enables delicate and detailed workpiece machining.

Housing
Industry I General Machinery
Size I D150 X L300
Material I Aluminum
Tools I 19

Impeller
Industry I Aerospace
Size I D120 X L80
Material I Aluminum
Tools I 6



Barrel
Industry I Electronics
Size I D70 X L50
Material I Aluminum
Tools I 50

Bucket blade
Industry I Energy
Size I 85t x D120 x L600
Material I Stainless steel
Tools I 8

Ergonomic Design

Maximizes user's convenience by employing ergonomic design concept

Ease of Machine Setup through Ergonomic Design

By laying out the operation panel and tool magazine in a user-friendly way, tooling and workpiece setup become easier for the operator.

1.
Operation panel with side-to-side movement, swivel action and adjustable height

Swivel angel adjustment : 100°
Height adjustment : 190 mm (7.5 inch)
Longitudinal movable :
1350 mm (53.1 inch)

2.
Convenient ATC-MAGAZINE operation panel

Easy ATC and magazine condition check by using a touch screen

3.
Easy access for the operator to the spindle through the angled style exterior front cover

Minimum distance for operator reach to reduce fatigue

4.
Extended front window

Enables the operator to easily monitor the machining operation using the large front window

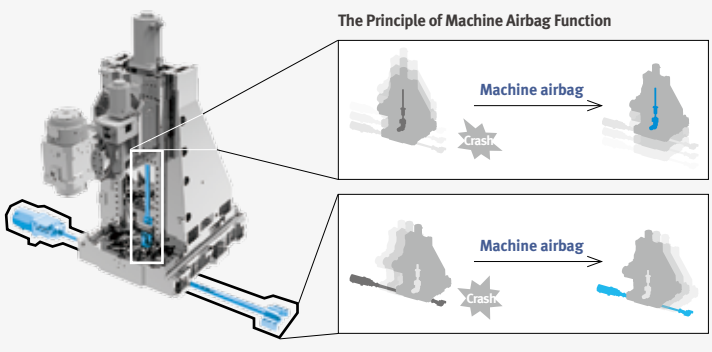
Award

An excellently designed PUMA SMX series has received the world's leading design awards, such as **the 2014 German Red Dot**, **the 2013 Australian AIDA** (Australian International Design Award), **the 2013 Korean Good Design**, etc. Thus, it is internationally recognized for its shape, function, quality, safety sustainability and innovation.

Safety Design to decrease Collision-caused Damage

Machine Airbag Function

Machine airbag function minimizes damage in the event of a machine collision, defect or heavy load by detecting sudden axis load increase.



If a collision is detected by a sudden increase in torque during axis movement, the servo motor immediately moves in reverse to partially retract the cutter.

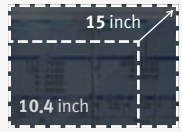
Easy Operation and Maintenance

Enhances ease of operation by the design based on the operator's functions and also provides maintenance functions that reduce downtime by decreasing the MTTR.*

User-friendly Operation Panel

The operator panel is designed to provide easy operation and also maintenance functions to reduce downtime. A large size 15-inch screen is applied as standard on the customized operator panel.

15-inch wide screen display unit



Optimized system design that reflects Doosan's know-how from long-term experience and the customer's needs

A design for easy operation	easy and convenient user interface, enhanced lamp visibility, optimized button size for easy operation and long life, use of a partition-type layout to prevent incorrect button operation
Addition of simple option buttons	additional function buttons can be easily fitted to spare sections of the operator panel
Customized function support	attachment of customized function switches and customized additional panel design

Simple Alarm Function

Doosan's EOP* system enables the user to operate the NC* system more conveniently.

Alarm Guide Function

- Alarm notification for user check-up

- Alarm notification of actuator and sensor status

Easy check-up of alarm status and troubleshooting problems by access to 3D displays of internal mechanisms

Periodic Maintenance Notification Function

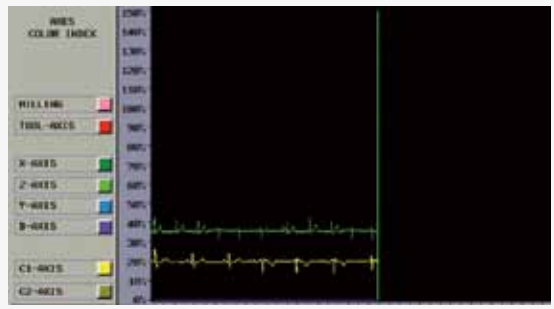
- Avoids unexpected downtime
- Reduces maintenance cost
- Increases production efficiency
- Optimizes the performance

Manages and extends the lifespan of cutting tools

* EOP : Easy Operation Package / NC : Numerical Control

Tool Load Monitoring

It is possible to display various types of information about each tool and to monitor the tool load in real-time.



* MTTR : Mean Time to Repair

CUFOS

Customized User-friendly Flexible Operation Solutions

CUFOS is a PC based control system created by Doosan Machine Tools. Equipped with intuitive user-friendly functions such as a smart phone screen and easy customization, CUFOS helps to improve operational efficiency and performance for the user.

• Features of CUFOS

User-Friendly

- **19 inch Multi Touch Screen**
- **Multiple Apps such as –**
  - **CPS app (Collision Protection System)**
  - **Turn-cut app**
  - Tool management app
  - Status monitoring and alarm guidance app
- **Max. program memory : 40GB** option
- App-based Interface for Smartphones & Tablet PC

Customized

- Simple Customization
- Extend Functionality with Additional apps
- Register for up to 6 individual users

Flexible

- Simple Connectivity with External Software (Cloud, Office etc.)
- SSD data server app
- PC based operating system (Windows®7)

CUFOS Interface

User-Friendly Interface

CUFOS, the PC-based control created by Doosan Machine Tools, is an integrated system solution using an intuitive 19 inch touch screen. The system provides a convenient operator interface, a high level of customization and many useful high technology apps.

Intuitive operation via the touch screen

Simple customization is available for customers' work environment.

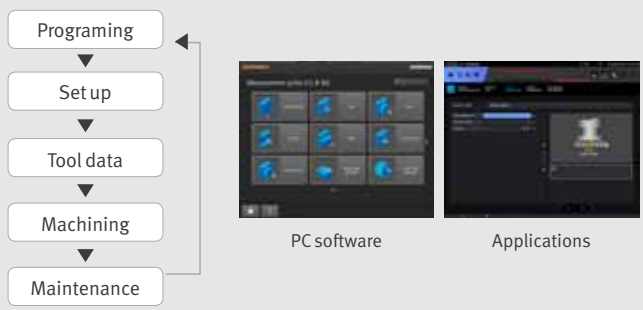
Supports various Apps in three fields – Setup/Machining/Utility.
It provides easy configuration by allowing the user to add and edit functions on the Home Screen according to job requirements.

CUFOS Open CNC

CUFOS operation for enhanced productivity

The CUFOS operating system is based upon the integration of all aspects of the manufacturing process, including setting, machining and maintenance. It consolidates up-to-date software technology created by Doosan Machine Tools, to improve overall efficiency and productivity. Using the system's modular construction, each function can be easy integrated with external PC software systems and applications, such as CAM and Tool Data systems.

DOOSAN CUFOS



CUFOS Machines

Maximizing efficiency for multi-tasking machining

Applied to those multi-tasking turning center like PUMA SMX series as well as high performance, high productivity horizontal machining center NHP/NHM series, CUFOS maximizes the operational efficiency by adding up-to-date software technology of Doosan Machine Tools including new developed application such as CPS (Collision Protection System), Turn-cut, and the Tool Management function etc.

Machining

Reduce downtime and improve productivity by providing CPS(Collision Protection System), real-time status monitoring and maintenance guides during operating the machine

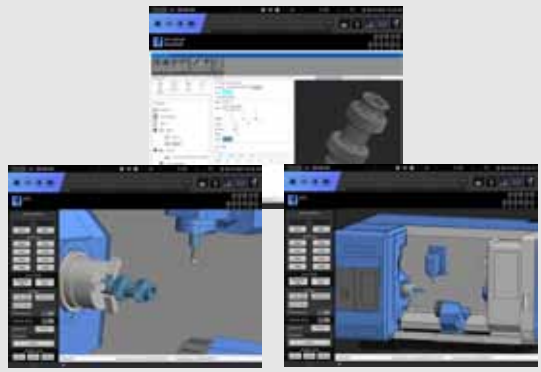
CPS (Collision Protection System)

A function to prevent real-time collision in manual mode between the tool and equipment / machine elements inside the working area.

Applicable models :
NHM/NHP/PUMA SMX series

- Supports Sandvik's cloud-based tool library for creation of 3D tool model

Use the Setup Manager with the CPS app to build up the machine model, and add tool, workpiece and workholding equipment details.



SSD data server

As a PC based NC, it allows the HDD to be used as a storage space for machining program, saving time for program transfer.

Applicable models :
NHM/NHP/PUMA SMX series

Max. storage size
40GB*

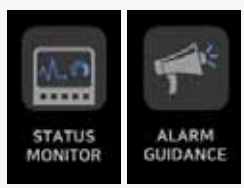
Max. file size
2GB

Max. file number
Up to 1000
(including folder)

* Max. storage size is determined by the size of SSD in Panel iHPro. If customer need Max. storage size of 40GB, it is necessary to select SSD129GB(option).

NC control

Easy to convert the screen to standard FANUC format for operator convenience



Status monitoring & Alarm guidance

Displays the cause and necessary action for NC/PMC alarms during machine running time. The system can send an email containing the alarm message if the condition persists for a specified time period.

Applicable models :
NHM/NHP/
PUMA SMX series

Set up

Make easy & interactive guides to facilitate machining preparations such as setting materials, tool management and warming-up

Warming up

Automatically checks if a warm up process is required, and displays the required operator procedure graphically. The requirement is automatically determined by the machine status.

Applicable model:
PUMA SMX series

Utility

Support user convenience functions and additional software modules handling various peripheral devices like measurement

Setting

CUFOS Provides management and setting functions such as HMI parameter / User setting / Setup manager /e-mail

User setting
Allows the user to register and delete up to six persons from the user account. CUFOS apps and NC functions can be user-restricted as necessary.

Memo

Users can generate memos, either with a high level of detail via screen capture, or entered by keyboard/ touchscreen. The user can add data to existing memos if required

Maximum 120 memos can be saved

Memo through touch screen or key board or using a captured screen

Utility

Manual viewer

Users can store and view manuals on the 19 inch screen.

Maintenance manager

Monitors the status of machine and control elements, and confirms the alarm condition and maintenance schedule for preventative maintenance.

Video viewer

Video transfer and viewer functions make clearer communication possible between operators and helpful for training new workers, complex job arrangement

*** Video format : .wmv, .avi, .mpg, .mpeg, .mp2, mp3, .wav, .mov, .mp4 (same as Window media open files)**

Standard / Optional Specifications (CUFOS)

A diverse range of functions and apps are available to meet specific customer requirements.

● Standard ○ Optional X Not applicable

NO.	Description	Features		PUMA SMX series
1	Hardware	19" Color LCD Screen		●
2		Main RAM memory (4GB)		●
3		Storage Memory	SSD 32GB (Max. storage size 10GB)	●
4			SSD 64GB (Max. storage size 20GB)	○
5			SSD 128GB (Max. storage size 40GB)	○
6		2point -touch panel port		●
7		Windows Embedded standard 7 Operating System (Including the Recovery disk)		●
8	Applications	Doosan Tool Management for SMX		○
9		CPS (Collision Protection System)		○
10		SSD Data server application		○
11		Manager's Message Notification application		●
12		FTP Server service		●
13		Smart key access control application		○
14		Memo application		●
15		Machine status Monitor application		●
16		Alarm guidance application		●
17	iHMI Basic Application	Manual viwer application		●
18		Calendar application		●
19		Browser application		●
20		Maintenance Manager application		●
21		Data Logger application		●
22		Servo viewer application		●

* Please contact your Doosan machine tool representative for detailed solution information.

Standard / Optional Specifications

● Standard ○ Optional X Not applicable

NO.	Division	Option		PUMA SMX 2600	PUMA SMX 3100	PUMA SMX 3100L	PUMA SMX 2600S	PUMA SMX 3100S	PUMA SMX 3100LS	PUMA SMX 2600ST	PUMA SMX 3100ST
1	Tool shank	CAPTO C6		●	●	●	●	●	●	●	●
2		HSK-A63		○	○	○	○	○	○	○	○
3	Automatic tool changer	3.5" operation touch panel		●	●	●	●	●	●	●	●
4		10.4" operation touch panel		○	○	○	○	○	○	○	○
5	Tool magazine	40 tools		●	●	●	●	●	●	●	●
6		80 tools		○	○	○	○	○	○	○	○
7		120 tools		X	X	X	X	X	X	○*	○*
8	Long boring bar magazine	3 tools		X	X	○	X	X	○	X	X
9	Work holding device	Left spindle	Hydraulic chuck 10"	●	X	X	●	X	X	●	X
10			Hydraulic chuck 12"	○	●	●	○	●	●	○	●
11			Hydraulic chuck 15"	X	○	○	X	○	○	X	○
12		Right spindle	Hydraulic chuck 10"	X	X	X	●	●	●	●	●
13			Hydraulic chuck 12"	X	X	X	○	○	○	○	○
14		Dual pressure chucking		○	○	○	○	○	○	○	○
15		Chuck clamp confirmation		○	○	○	○	○	○	○	○
16		Servo driven steady rest(SLU3.1~SLU5) -Steady rest parking function is impossible		○	○	○	○	○	○	X	X
17		Servo driven steady rest(SLU5.1 or K5.0 or K5.1) with steady rest parking function		X	X	○	X	X	○	X	X
18		Servo driven steady rest(SLU3Z or3.1Z or 3.2Z) - for Lower turret		X	X	X	X	X	X	○	○
19	Coolant	T-T-C (Through Tool Coolant) Milling spindle	Pressure 1.0MPa (145 psi)/bag filter	●	●	●	●	●	●	●	●
20			Pressure 3.0MPa (435 psi) /Cyclone filter	○	○	○	○	○	○	○	○
21			Pressure 7.0MPa (1015 psi) / Cyclone filter	○	○	○	○	○	○	○	○
22			Pressure 7.0MPa (1015 psi)/paper filter	○	○	○	○	○	○	○	○
23			MQL (Minimum quantity lubrication) system	○	○	○	○	○	○	○	○
24		For Lower turret	Pressure 0.45MPa (65.2psi) / Tank screen fiter	X	X	X	X	X	X	●	●
25			Pressure 0.7 / 1.0 / 1.45 MPa (101.5/145/151.1 psi) / Tank screen fiter	X	X	X	X	X	X	○	○
26		Oil skimmer		○	○	○	○	○	○	○	○
27		Coolant pressure switch (Standard for milling spindle / option for lower turret)		●	●	●	●	●	●	●	●
28		Coolant level switch : Sensing level - Low		●	●	●	●	●	●	●	●
29	Chip disposal	Chip conveyor (Right disposal)		○	○	○	○	○	○	○	○
31		Chip bucket		○	○	○	○	○	○	○	○
32		Air blower (for Left or Right spindle chuck)		●	●	●	●	●	●	●	●
33		Chuck coolant (for Left or Right spindle chuck)		○	○	○	○	○	○	○	○
34		Through spindle coolant (Left or Right)		○	○	○	○	○	○	○	○
35		Shower coolant(1.1kW, 165 liter/min)		○	○	○	○	○	○	○	○
36		Coolant gun		○	○	○	○	○	○	○	○
37		Air gun		○	○	○	○	○	○	○	○
38		Mist collector		○	○	○	○	○	○	○	○
39	High accuracy	Thermal compensation		●	●	●	●	●	●	●	●
40		Ball screw core cooling (X-axis)		●	●	●	●	●	●	●	●
41		Ball screw core cooling (Y/Z-axis)		○	○	○	○	○	○	○	○
42		Coolant chiller (temperature control)		○	○	○	○	○	○	○	○
43		Linear scale feed back (X1-axis)		○	○	●	○	○	●	○	○
44		Linear scale feed back (X2-axis)		X	X	X	X	X	X	○	○
45		Linear scale feed back (Y/Z-axis)		○	○	○	○	○	○	○	○
46	Measurement	Auto tool setter		○	○	○	○	○	○	○	○
47		Auto workpiece measurement (RMP60)		○	○	○	○	○	○	○	○
48	Automation	Parts unloader and conveyor		X	X	X	○	○	X	○	○
49		Workpiece ejector		X	X	X	○	○	X	○	○
50		Bar feeder interface		○	○	○	○	○	○	○*	○*
51		Automatic front door (with safety device)		○	○	○	○	○	○	○	○
52	Others	Doosan tool monitoring system		●	●	●	●	●	●	●	●
53		Rotay type window wiper		○	○	○	○	○	○	○	○
54		Intelligent Kinematic Compensation for Multi-tasking (Software customized by Doosan)		●	●	●	●	●	●	●	●
55		Intelligent Kinematic Compensation for Multi-tasking (Datum Ball gage)		○	○	○	○	○	○	○	○
56		Quick change tooling(CAPTO) **		○	○	○	○	○	○	○	○
57	Standard Accessories	FOUNDATION BOLT FOR ANCHORING		●	●	●	●	●	●	●	●
58	Customized Special Option	PARTS UNLOADER AND CONVEYOR_GRIPPER TYPE		X	X	X	○	○	X	○	○
59		STEADY REST_HOLDER_ON TURRET		X	X	X	X	X	X	○	○
60		V STAND FOR SHAFT WORKPIECE		○	○	○	○	○	○	○	○
61		AIR LIMIT SENSING ON CHUCK_PREPARATION		○	○	○	○	○	○	○	○
62		DISPLAY UNIT SIZE_19.0 INCH COLOR		○	○	○	○	○	○	○	○
63		TOOL SETTER EXTENSION FOR SPECIAL CHUCK		X	X	X	X	X	X	○	○
64		MAIN/LEFT SPINDLE AIR CURTAIN		○	○	○	○	○	○	○	○
65		SUB/RIGHT SPINDLE AIR CURTAIN		X	X	X	○	○	○	○	○
66		TOOL SETTER_NON-CONTACTING_NC4_RENISHAW		○	○	○	○	○	○	○	○
67		TOOL SETTER_NON-CONTACTING_BLUM		○	○	○	○	○	○	○	○
68		COOLANT FOR MILLING SPDL_MULTI PRESSURE		○	○	○	○	○	○	○	○
69		MQL SYSTEM		○	○	○	○	○	○	○	○
70		TOOL ID CHECK SYSTEM_MANUAL		○	○	○	○	○	○	○	○
71		ADDITIONAL WORK LIGHT FOR ATC MAGAZINE		○	○	○	○	○	○	○	○
72		ANGULAR HEAD FOR MILLING SPINDLE_ATC		○	○	○	○	○	○	○	○

* Bar feeder interface is not available in case of PUMA SMX2600ST/3100ST with ATC 120 tool magazine. ** Lower turret Applicable

Servo driven Steady rest option 16, 17, 18

This equipment supports long workpieces during the machining process. Linear positioning of the steady rest is achieved by servo motor and ball screw and can be positioned during cycle.

Steady rest parking function*

When you don't want to use steady rest, you can make it parked under left chuck.

* This function is possible just for PUMA SMX3100L/LS with the steady rest selected one from among SLU5.1, K5.0 and K5.1.

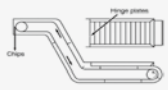
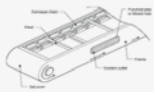
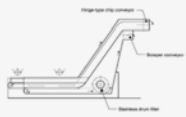
Applicable model	Steady rest	Working range
PUMA SMX2600 / S **PUMA SMX3100/L/S/LS** (Steady rest parking function is impossible) ❶	SLU-3.1	Ø20~Ø165 mm (0.8~6.5 inch)
	SLU-3.2	Ø50~Ø200 mm (2.0~7.9 inch)
	SLU-4	Ø35~Ø245 mm (1.4~9.6 inch)
	SLU-5	Ø50~Ø310 mm (2.0~12.2 inch)
PUMA SMX3100L / LS (Steady rest parking function is impossible) ❷	SLU-5.1	Ø85~Ø350 mm (3.3~13.8 inch)
	K 5.0	Ø80~Ø390 mm (3.1~15.4 inch)
	K 5.1	Ø100~Ø410 mm (3.9~16.1 inch)
PUMA SMX2600ST / 3100ST - Steady rest for lower turret	SLU-3	Ø12~Ø152 mm (0.5~6.0 inch)
	SLU-3.1	Ø20~Ø165 mm (0.8~6.5 inch)
	SLU-3.2	Ø50~Ø200 mm (2.0~7.9 inch)

❶ In PUMA SMX2600/S, 3100/S, the steady rest parking function is not possible. And also, the function is not possible when the steady rest is selected from among SLU-3.1 to SLU-5 for PUMA SMX3100L/LS.

❷ Using 15-inch chuck in PUMA SMX3100L/LS instead of standard 12-inch, if you select Servo driven Steady rest for PUMA SMX3100L/LS, the steady rest must be K5.1 to make it use of steady rest parking function.

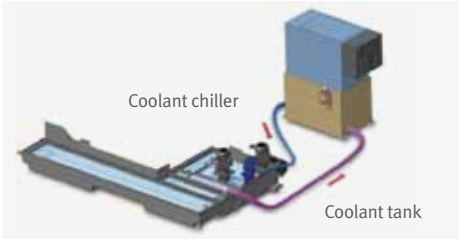
Chip Conveyor (Right side exit) option 31

The conveyor provides a superior chip removal system and is designed with a stable structure for easy maintenance and reduced leakage. By selecting the correct type of conveyor, the efficiency of the machine working area is increased.

Name	**Hinge Belt**	**Magnetic Scraper**	**Drum filter +Hinge scraper** (Double type)
Application	For steel	For castings	For steel, castings, nonferrous metal
Features	- General - Appropriate for a heavy material chip of more than 30 mm in length	- Easy maintenance - Eject the chip by scraping and raising the chip with the scraper	- Appropriate for both a long and a short chip - Filtering coolant
Shape			

Coolant Chiller (Recommendation) option 43

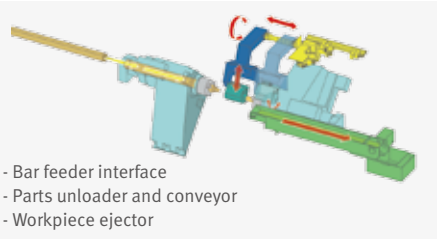
A coolant chiller minimizes the thermal deformation by controlling the temperature of the return coolant to the machine, thus improving the accuracy.



Optional Equipment for Automation

option 49, 50, 51

Various peripheral equipment is available to support the SMX to improve its performance and productivity.



- Bar feeder interface
- Parts unloader and conveyor
- Workpiece ejector

Tailstock application for lower turret option

- steady rest to support long and slim components for improving machining stability
- Tailstock application for lower turret is available to PUMA SMX2600ST/3100ST. option

Tool Setter (Automatic) option 47

Auto linear motion type tool setter has been installed for tool measurement and tool wear detection. It is stored in a safe location during the machining process, and can be activated with the workpiece still in place in the chuck with no interference.

Gear skiving solutions

We propose a dramatic improvement in productivity with gear skiving solutions such as power skiving, invo-milling, and hobbing, which allow high-precision external / internal gear machining with a single setting.

* Please contact to DOOSAN on further information.

Linear scale option 44, 45, 46

We propose linear scale when you want to achieve high accuracy of simultaneous 5-axis machining, long term machining and higher feed precision.

Quick change CAPTO option 57

The Quick Change Tool system simplifies tool change operation. Recommended for users who need to change tools frequently or reduce the set-up time.

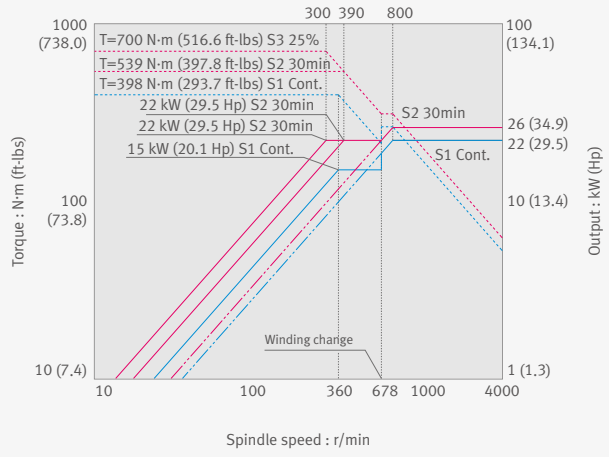
* Lower turret Applicable

Spindle Power – Torque Diagram

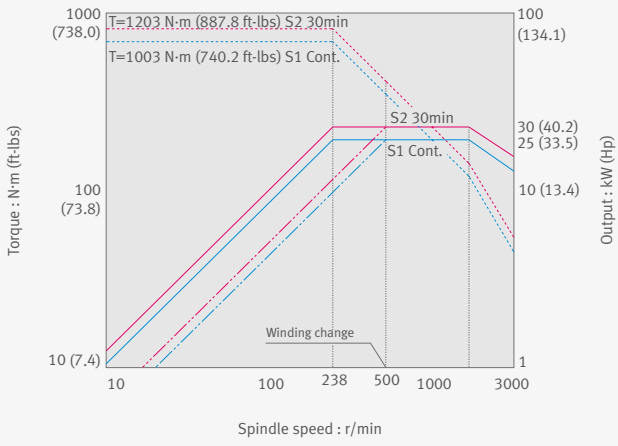
PUMA SMX series

Both turning and milling spindles have powerful heavy-duty built-in type motors to maximize productivity.

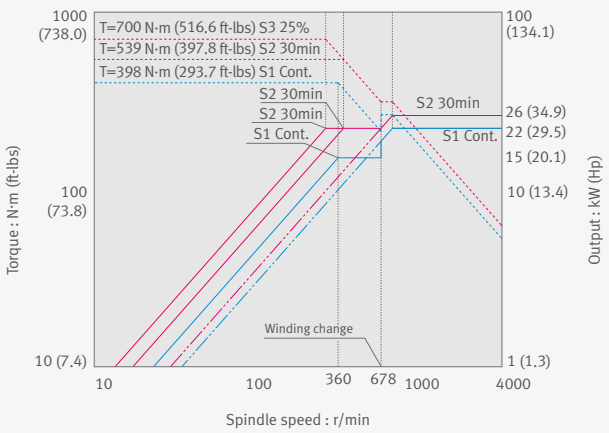
PUMA SMX2600 Left spindle



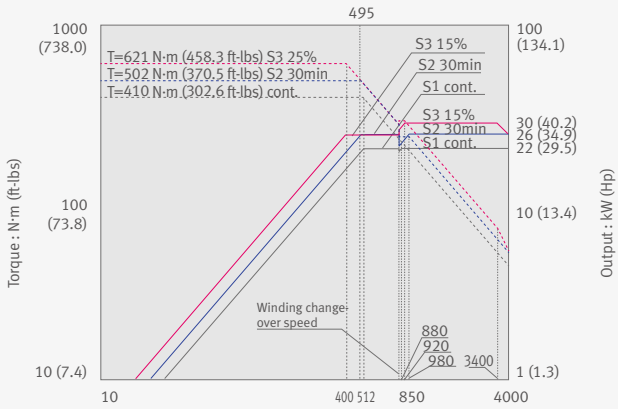
PUMA SMX3100 Left spindle



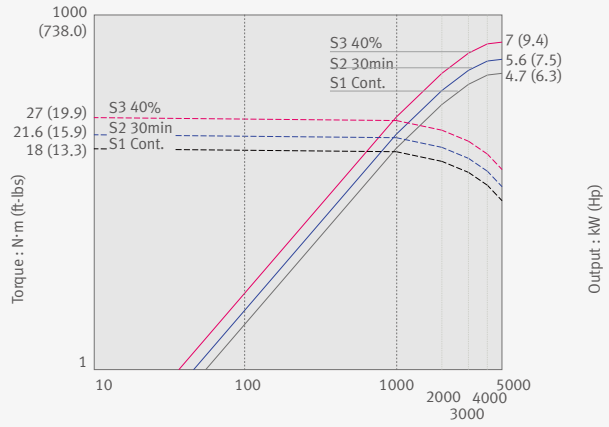
PUMA SMX2600S/3100S/3100LS Right spindle



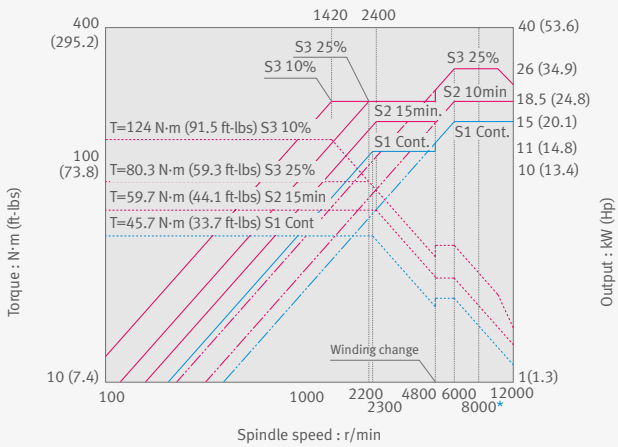
PUMA SMX2600ST/3100ST Right spindle



PUMA SMX2600ST / 3100ST Rotary tool for lower turret (Milling)



PUMA SMX2600/3100 Milling spindle



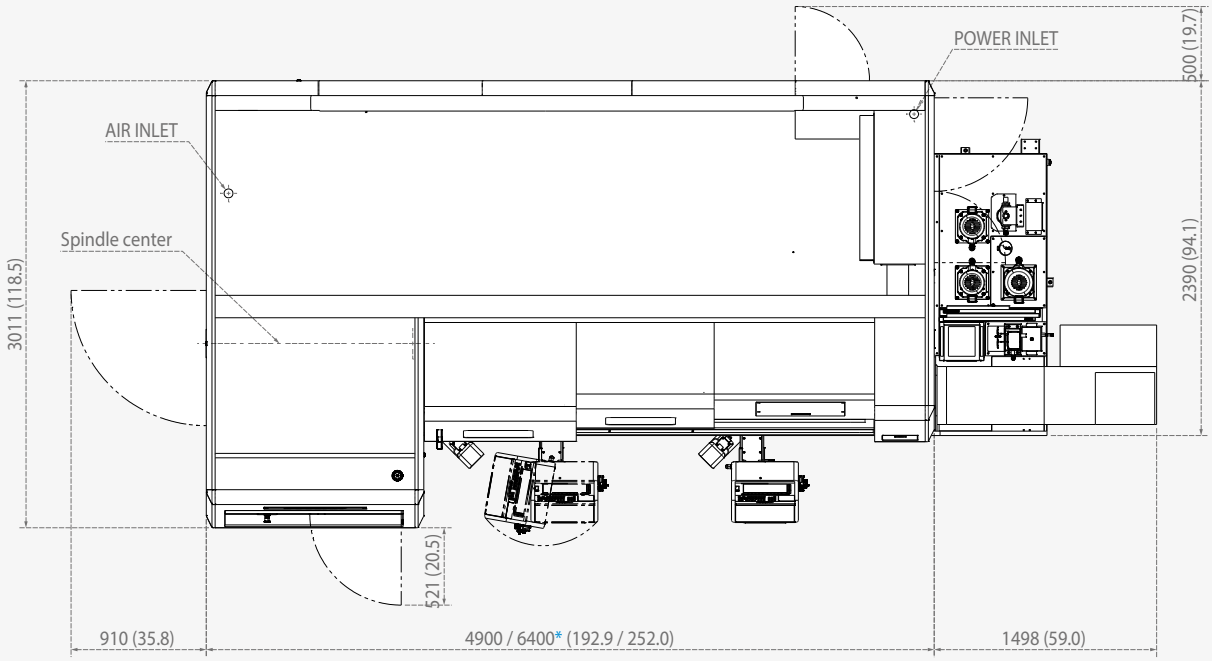
* 8000 r/min of Milling spindle is available as option option

External Dimensions

PUMA SMX2600/S, 3100/L/S/LS (40/80 Tools)

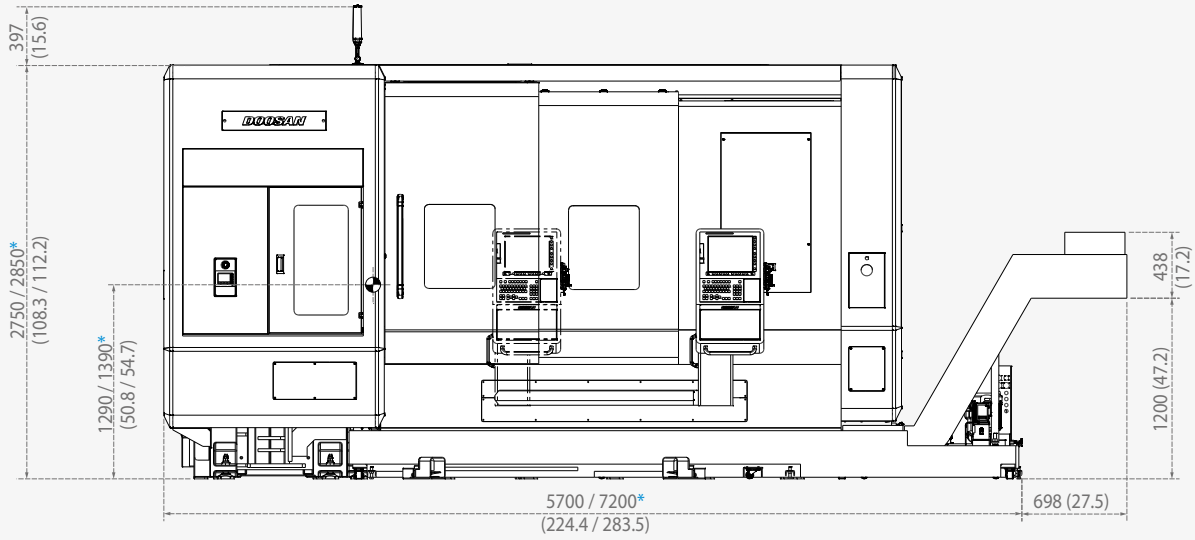
Unit : mm (inch)

Top view



* PUMA SMX3100L / LS

Front view



* PUMA SMX3100L / LS

Machine foundation : Anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items. Please consult with Doosan and sales technicians regarding ground and operating conditions.

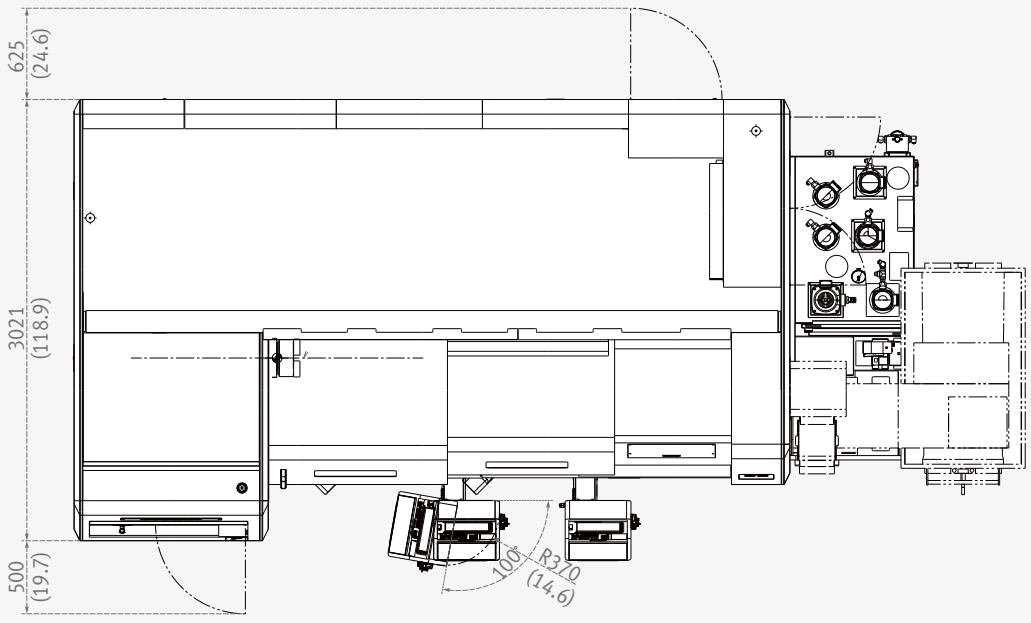
*Some peripherals can be placed in different locations.

External Dimensions

PUMA SMX2600ST/ 3100ST (40/80 Tools)

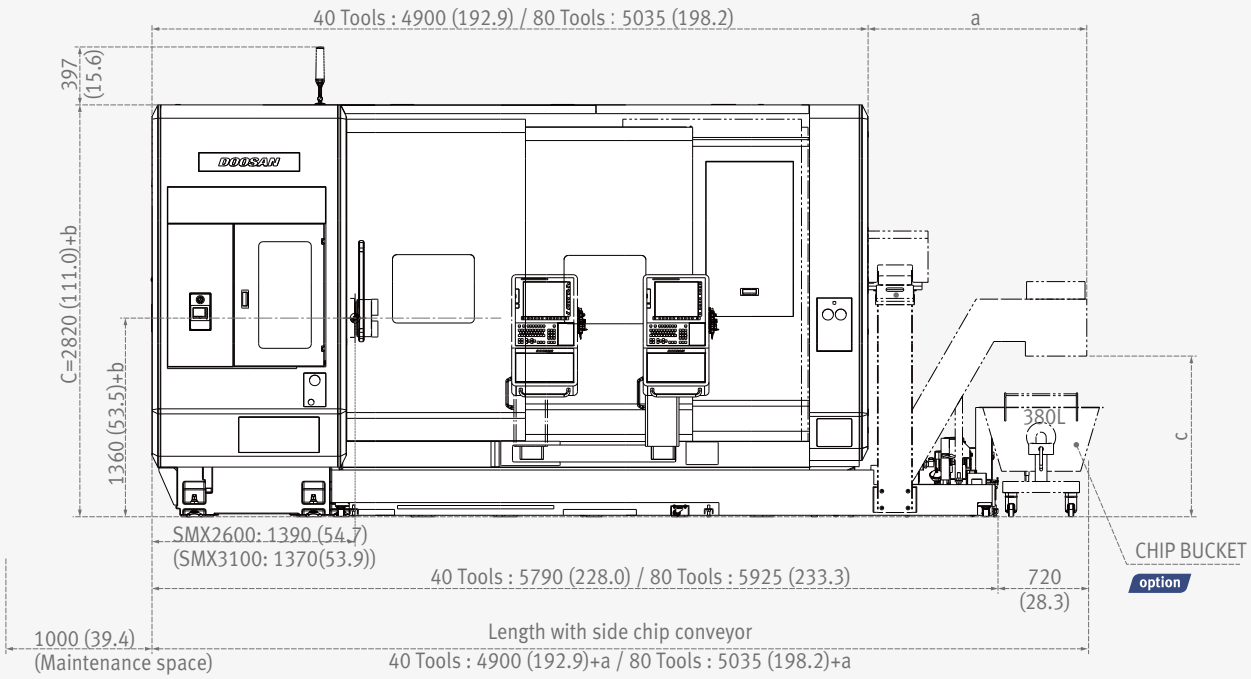
Unit : mm (inch)

Top view



Chip conveyor type	a	b	c
Hinge belt type	1498 (59.0)	0	1100 (43.3)
Drum filter+Hinge scraper type	2386 (93.9)	70 (2.8)	1050 (41.3)

Front view



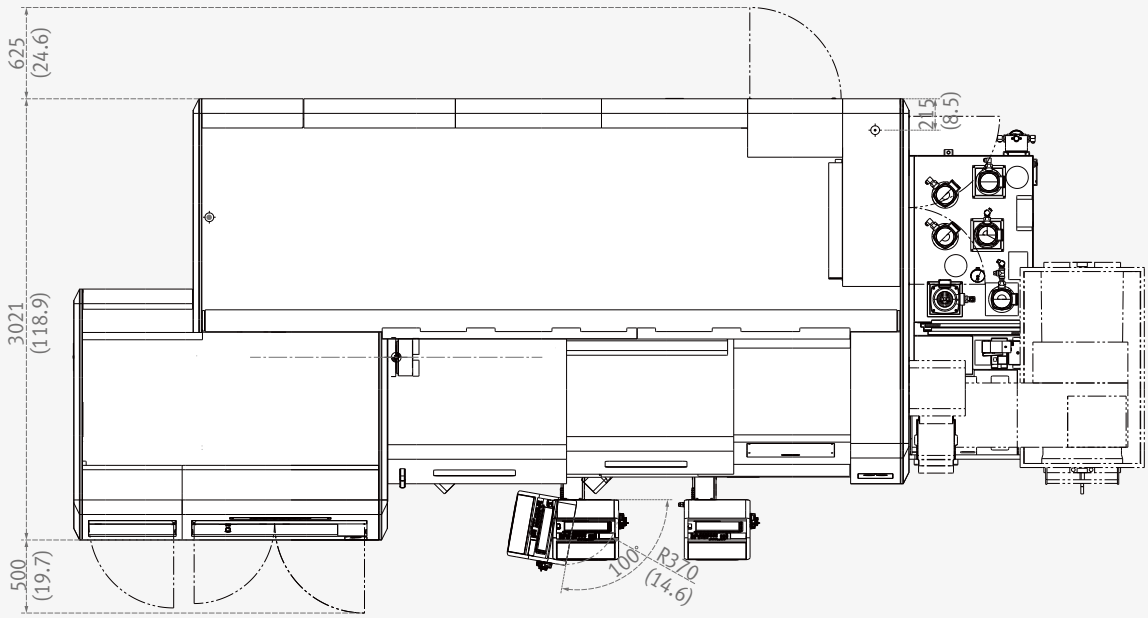
Machine foundation : Anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items. Please consult with Doosan and sales technicians regarding ground and operating conditions.

*Some peripherals can be placed in different locations.

PUMA SMX2600ST/ 3100ST (120 Tools)

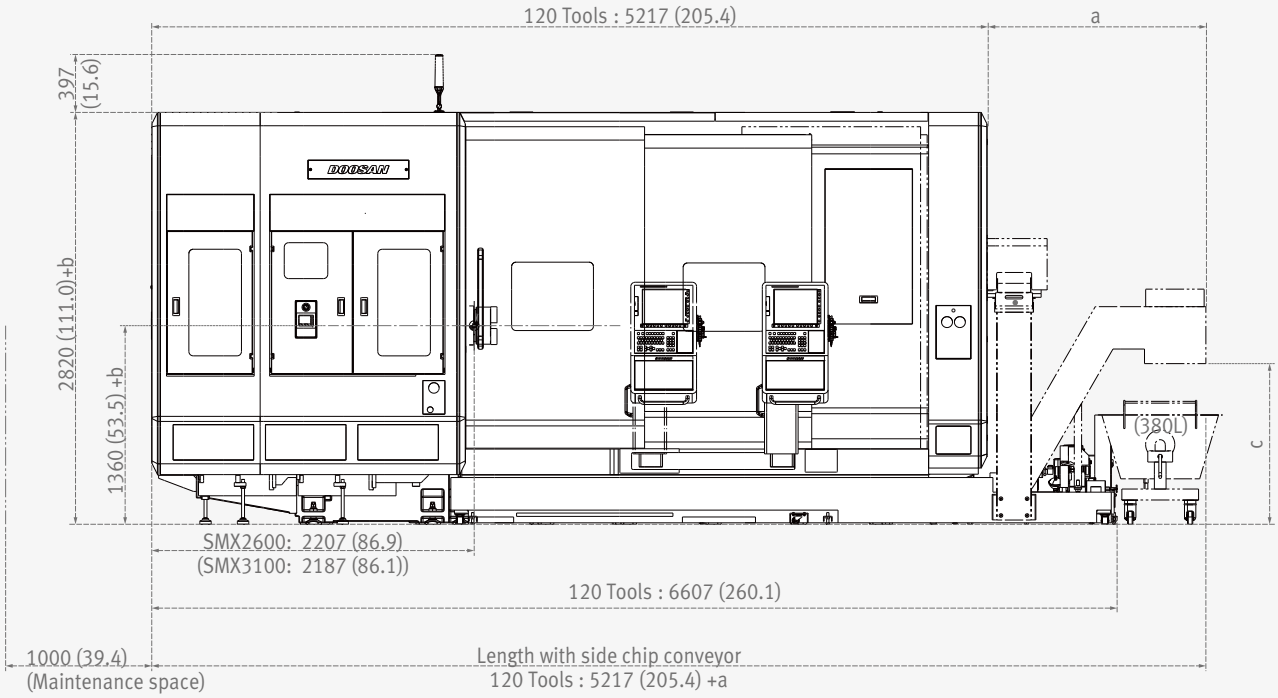
Unit : mm (inch)

Top view



Chip conveyor type	a	b	c
Hinge belt type	1498 (59.0)	0	1100 (43.3)
Drum filter+Hinge scraper type	2386 (93.9)	70 (2.8)	1050 (41.3)

Front view



Machine foundation : Anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items. Please consult with Doosan and sales technicians regarding ground and operating conditions.

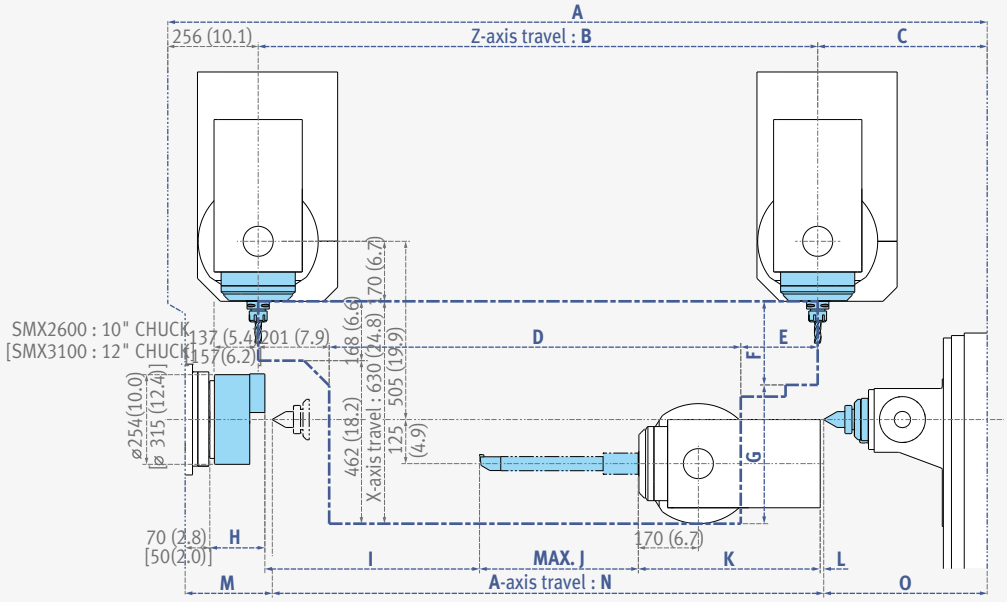
*Some peripherals can be placed in different locations.

Working Range

PUMA SMX2600/SMX3100 series

Entire range

Unit : mm (inch)

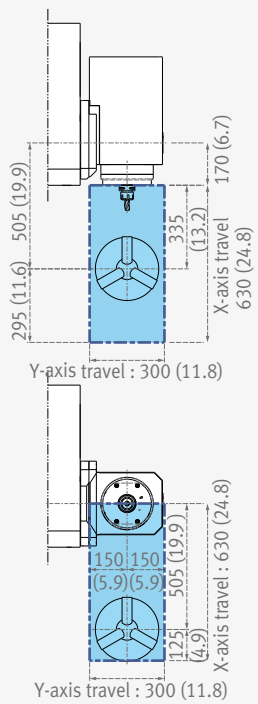


Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
PUMA SMX2600	2321 (91.4)	1585 (62.4)	480 (18.9)	1166 (45.9)	218 (8.6)	237 (9.3)	393 (15.5)	156 (6.1)	608 (23.9)	450 (17.7)	515 (20.3)	10 (0.4)	247 (9.7)	1562 (61.5)	463 (18.2)
PUMA SMX3100								176 (6.93)							
PUMA SMX3100L	3223 (126.9)	2585 (101.8)	382 (15)	2168 (85.4)	216 (8.5)	195 (7.7)	435 (17.1)	176 (6.93)	1610 (63.4)*	450 (17.7)*	515 (20.3)	12 (0.5)	313 (12.3)	2500 (98.4)	361 (14.2)

* "I" and "J" can be different depends on an applied long boring bar

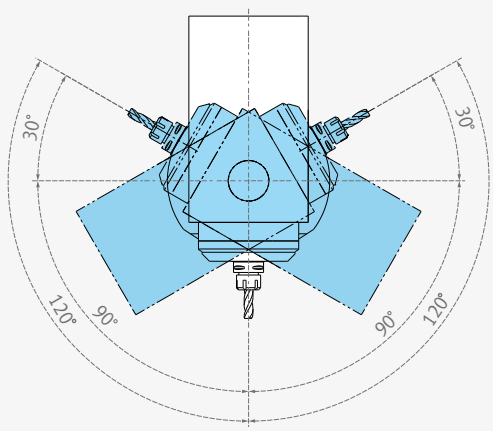
Y-axis working rage

Unit : mm (inch)



B-axis rotating range

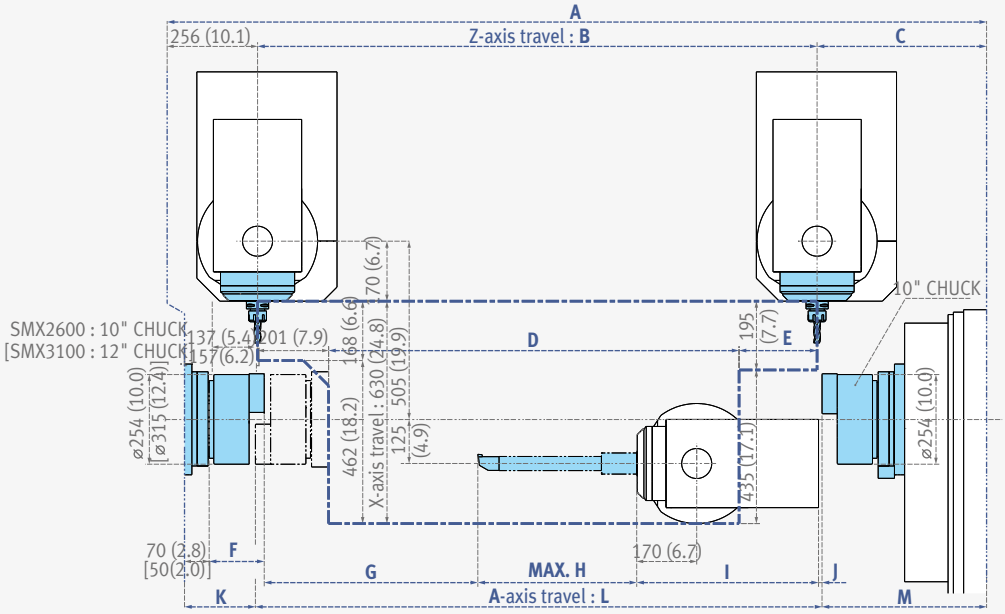
Unit : mm (inch)



PUMA SMX2600S/SMX3100S series

Entire range

Unit : mm (inch)

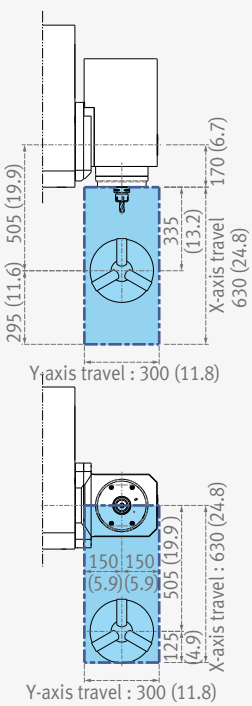


Model	A	B	C	D	E	F	G	H	I	J	K	L	M
PUMA SMX2600S	2321 (91.4)	1585 (62.4)	480 (18.9)	1163 (45.8)	221 (8.7)	156 (6.1)	605 (23.8)	450 (17.7)	515 (20.3)	10 (0.4)	201 (7.9)	1605 (63.2)	466 (18.3)
PUMA SMX3100S						176 (6.93)							
PUMA SMX3100LS	3223 (126.9)	2585 (101.8)	382 (15)	2168 (85.4)	216 (8.5)	176 (6.93)	1610 (63.4)*	450 (17.7)*	515 (20.3)	10 (0.4)	311 (12.2)	2500 (98.4)	363 (14.3)

* "G" and "H" can be different depends on an applied long boring bar

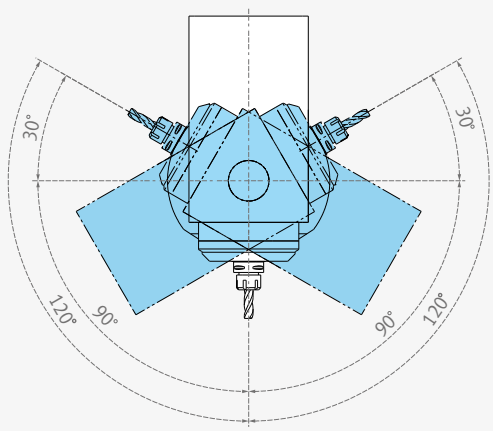
Y-axis working rage

Unit : mm (inch)



B-axis rotating range

Unit : mm (inch)

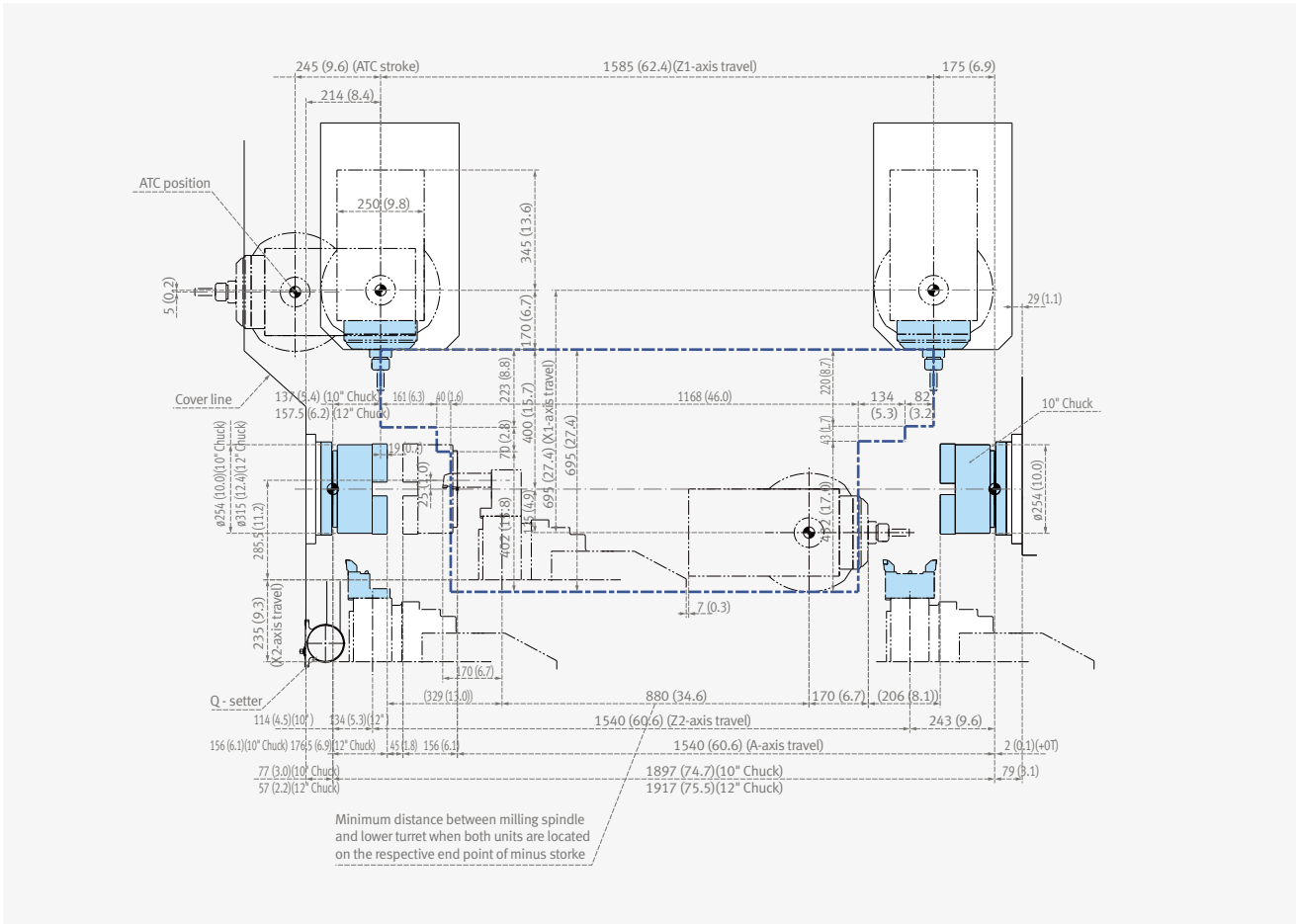


Working Range

PUMA SMX2600ST/SMX3100ST

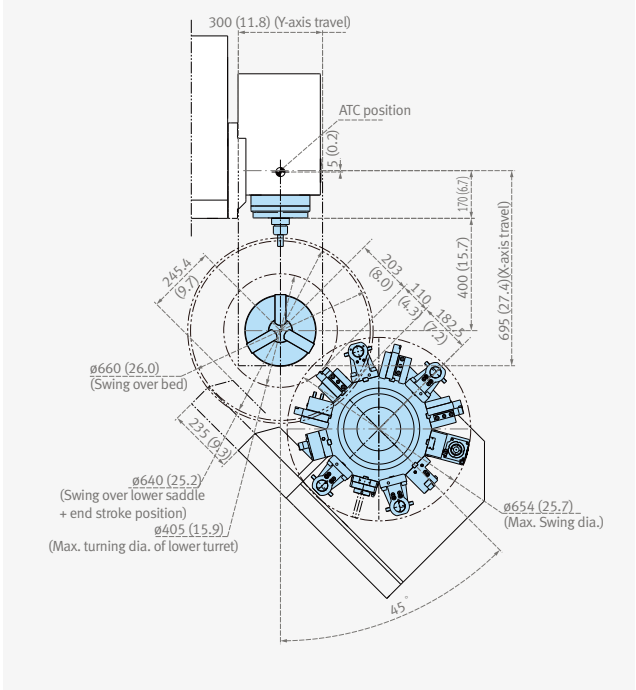
Entire range

Unit : mm (inch)



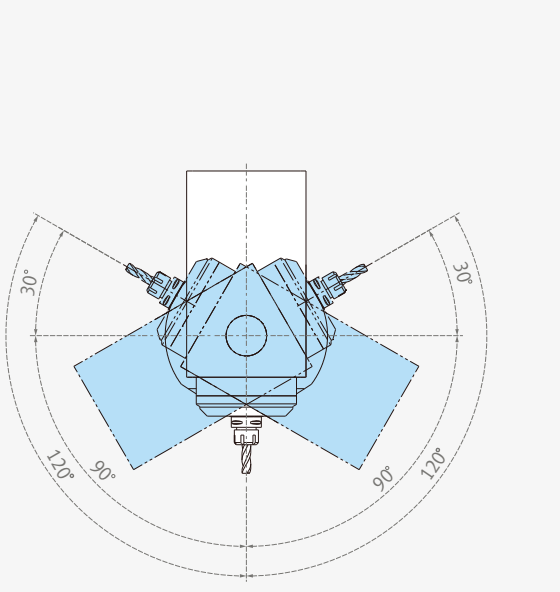
Y-axis working rage

Unit : mm (inch)



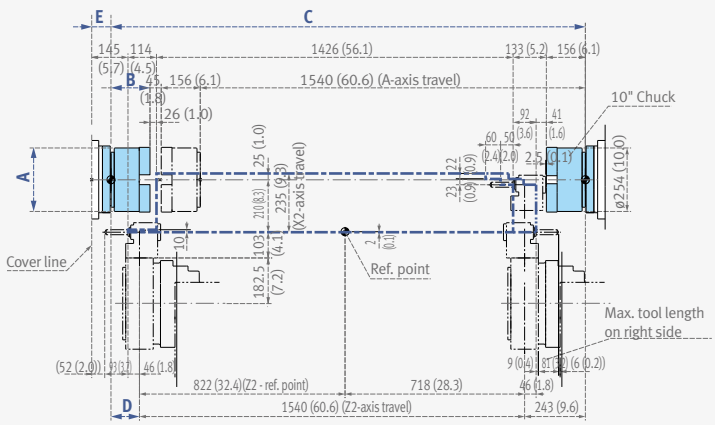
B-axis rotating range

Unit : mm (inch)

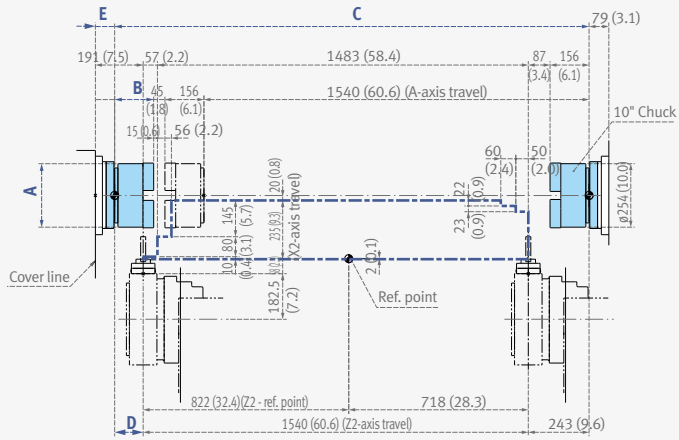


Unit : mm (inch)

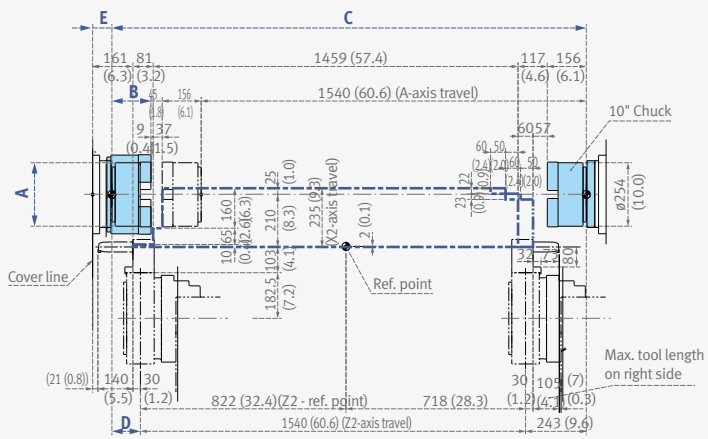
Angular Milling Head



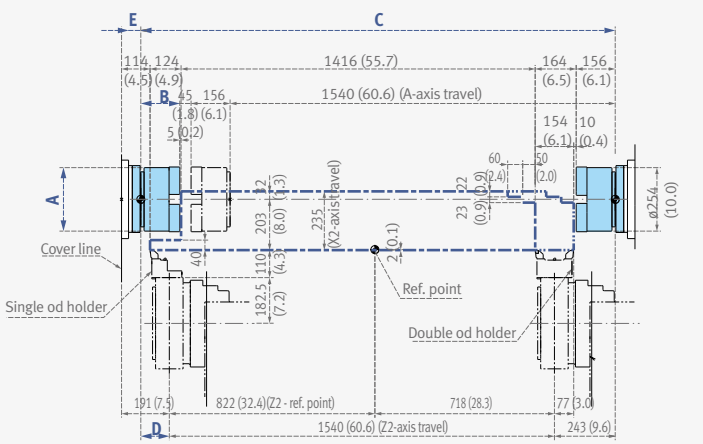
Straight Milling Head



ID Tool Holder



OD Tool Holder



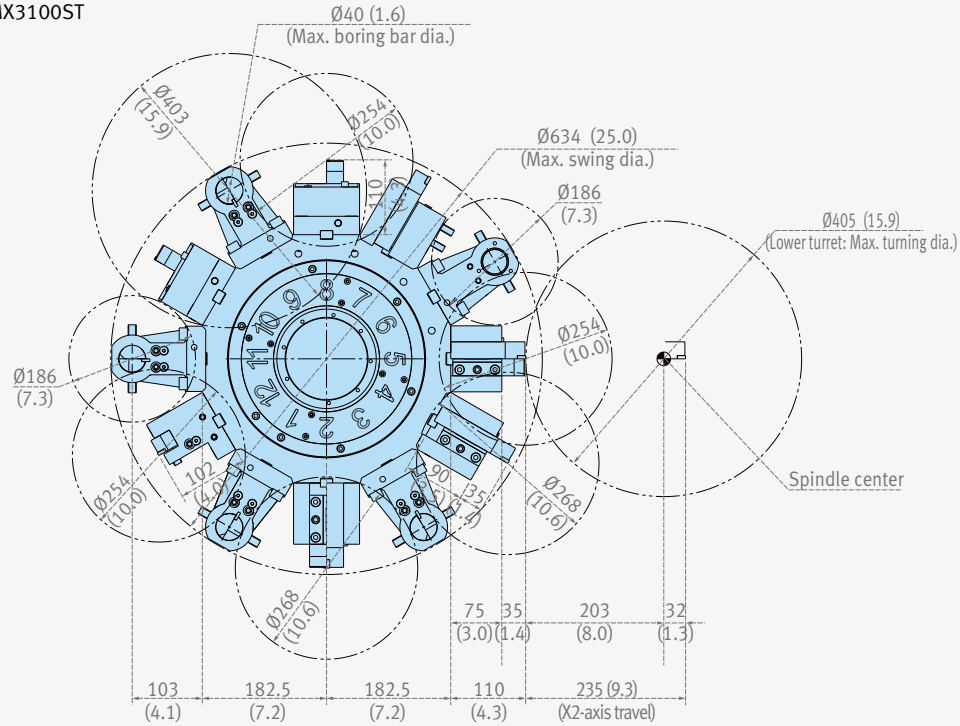
Model	Unit	A	B	C	D	E
PUMA SMX2600ST (10"Chuck)	mm (inch)	ø254 (10.0)	156 (6.1)	1897 (74.7)	114 (4.5)	77 (3.0)
PUMA SMX3100ST (12" Chuck)	mm (inch)	ø315 (12.4)	176.5 (6.9)	1917 (75.5)	134 (5.3)	57 (2.2)

Tool Interference Diagram of Lower Turret

For Turning (12 stations)

Unit : mm (inch)

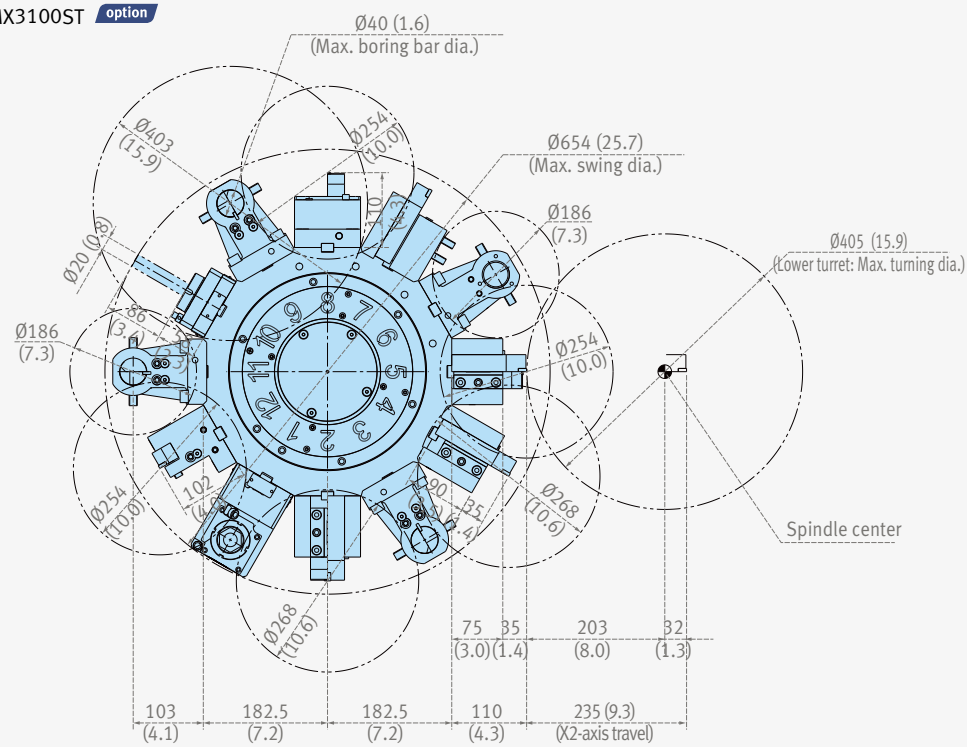
PUMA SMX2600ST/SMX3100ST



For Turn-Milling (12 stations, BMT65P)

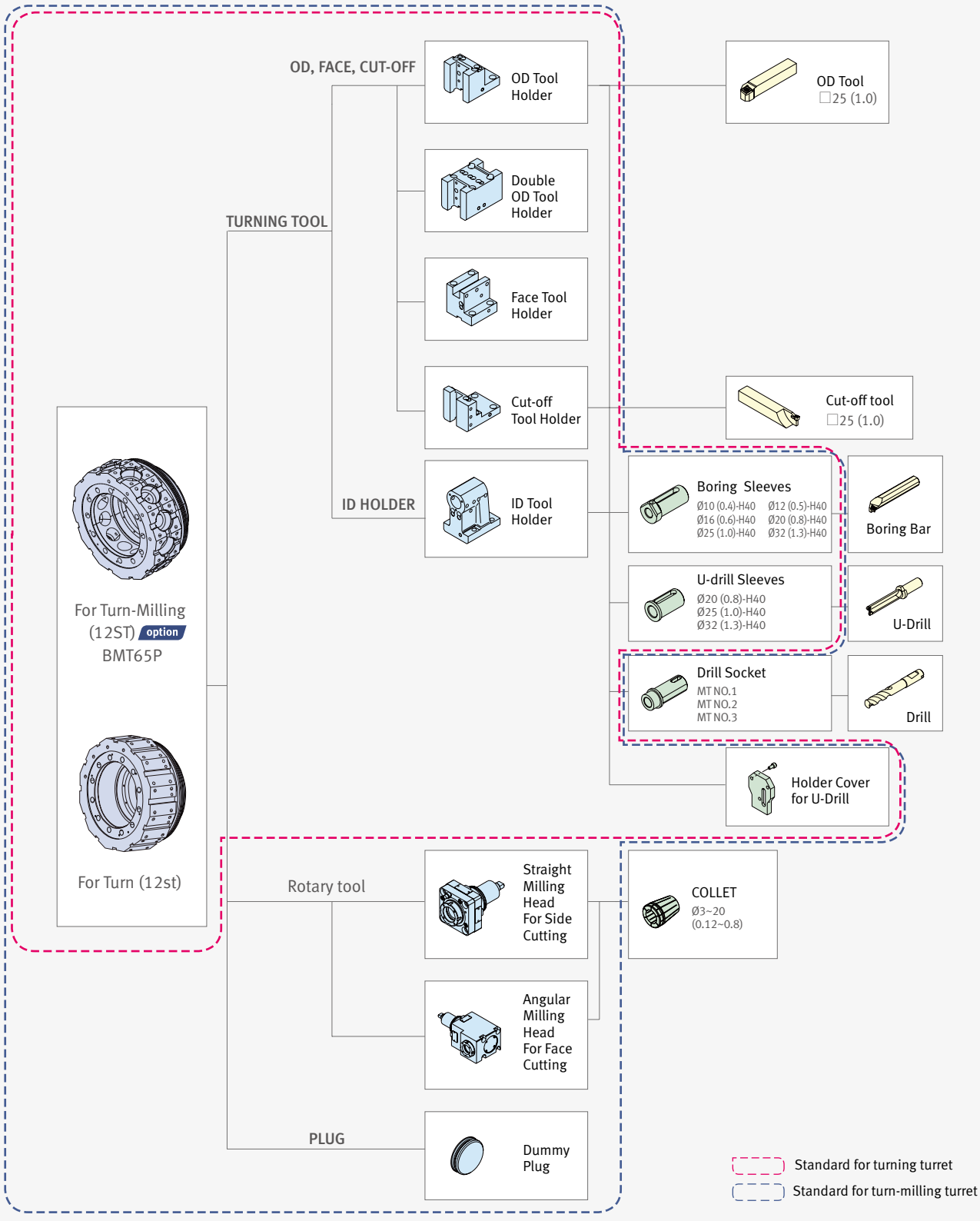
Unit : mm (inch)

PUMA SMX2600ST/SMX3100ST option



PUMA SMX2600ST/SMX3100ST

Unit : mm (inch)



Machine Specifications

Standard Features

- Tool and tool box
- Through spindle coolant for milling spindle
- Door interlock
- Level bolt and plate
- Servo tail stock (for PUMA SMX2600/3100/3100L)
- Soft jaws
- Spindle head cooling system
- Hydraulic unit
- Automatic coolant system
- Work lamp
- Standard hydraulic chuck
- X-axis linear scale (only PUMA SMX3100L/LS)

Item			Unit	PUMA SMX2600	PUMA SMX2600S
Capacity	Swing over bed		mm (inch)	660 (26.0)	
	Recom. turning diameter		mm (inch)	255 (10.0)	
	Max. turning diameter		mm (inch)	660 (26.0)	
	Max. turning length		mm (inch)	1540 (60.6)	
	Chuck size	Left spindle	inch	10 {12}*	
		Right spindle	inch	-	10 {12}*
	Chuck work weight (include chuck)		kg (lb)	260 (573.2)	
	Shaft work weight (include chuck)		kg (lb)	520 (1146.4)	
	Bar working diameter		mm (inch)	81 (3.2)	
Travels	Travel distance	X-axis	mm (inch)	630 (24.8)	
		Y-axis	mm (inch)	300 (±150) (11.8 (±5.9))	
		Z-axis	mm (inch)	1585 (62.4)	
		A-axis**	mm (inch)	1562 (61.5)	1605 (63.2)
		B-axis	deg	240 (±120)	
		C1-axis / C2-axis	deg	360 / 360	
		X2-axis / Z2-axis	mm (inch)	-	-
	Rapid traverse rate	X-axis	m/min (ipm)	48 (1889.8)	
		Y-axis	m/min (ipm)	36 (1417.3)	
		Z-axis	m/min (ipm)	48 (1889.8)	
		A-axis**	m/min (ipm)	-	30 (1181.1)
		B-axis	r/min	40	
		C1-axis / C2-axis	r/min	200 / 200	
		X2-axis / Z2-axis	m/min (ipm)	-	-
Left spindle	Max. spindle speed		r/min	4000	
	Spindle motor power (30min/cont.)		kW (Hp)	26/22 (34.9/29.5)	
	Spindle nose		ASA	A2-8	
	Spindle bearing diameter (Front)		mm (inch)	130 (5.1)	
	Spindle through hole		mm (inch)	91 (3.6)	
	Min. spindle indexing angle (C1-axis)		deg	0.0001	
Right spindle	Max. spindle speed		r/min	-	4000
	Spindle motor power (30min/cont.)		kW (Hp)	-	26/22 (34.9/29.5)
	Spindle nose		ASA	-	A2-8
	Spindle bearing diameter (Front)		mm (inch)	-	130 (5.1)
	Spindle through hole		mm (inch)	-	91 (3.6)
	Min. spindle indexing angle (C2-axis)		deg	-	0.001
Milling spindle	Max. spindle speed		r/min	12000 {8000}*	
	Milling spindle motor power (2.5min/10min/Cont.)		kW (Hp)	26/18.5/15 (34.9/24.8/20.1)	
	Min. spindle indexing angle (B-axis)		deg	0.0001	
Automatic Tool Changer	Tool storage capa. (Max.)		ea	40 {80}*	
	Tool shank		-	CAPTO C6 {HSK-A63}*	
	Max. tool diameter continous		mm (inch)	90 (3.5)	
	Max. tool diameter without adjacent tools		mm (inch)	130 (5.1)	
	Max. tool length		mm (inch)	450 (17.7)	
	Max. tool weight		kg (lb)	12 (26.5)	
	Max. tool moment		N·m (ft-lbs)	9.8 (7.2)	
	Tool change time (T-T-T)	Tool-to-tool	sec	1.8	
		Chip-to-chip	sec	7.8	
Lower turret	No. of tool stations		ea	-	
	OD tool size		mm (inch)	-	
	Max. boring bar size		mm (inch)	-	
	Turret Indexing time (1 station swivel)		s	-	
	Max. rotary tool speed		r/min	-	
Long Boring Bar Magazine (option for SMX 3100L/LS)	Tool storage capacity (Max.)		ea	-	
	Max. tool size		mm (inch)	-	
	Max. tool weight		kg (lb)	-	
Tail Stock	Quill bore taper		MT	#5	-
	Quill travel		mm (inch)	1562 (61.5)	-
Coolant	Coolant pump motor power		kW (Hp)	2.2 (3.0)	
Power source	Electric power supply (rated capacity)		kVA	64.61	89.91
Machine Dimensions	Height		mm (inch)	2750 (108.3)	2750 (108.3)
	Length		mm (inch)	4900 (192.9)	4900 (192.9)
	Width		mm (inch)	3011 (118.5)	3011 (118.5)
	Weight		kg (lb)	15800 (34832.5)	16200 (35714.4)
Control	NC system			FANUC31i {FANUC31i-5 / SIEMENS 840D***/ CUFOS}*	

PUMA SMX2600ST	PUMA SMX3100	PUMA SMX3100L	PUMA SMX3100S	PUMA SMX3100ST	PUMA SMX3100LS
660 (26.0)					
255 (10.0)	315 (12.4)				
660 (26.0) [Lower turret : 405 (15.9)]	660 (26.0)			660 (26.0) [Lower turret : 405 (15.9)]	660 (26.0)
1540 (60.6)	1540 (60.6)	2540 (100.0)	1540 (60.6)		2540 (100.0)
10 {12}*	12 {15}*				
10 {12}*	-	-	10 {12}*		
260 (573.2)	500 (1102.3)				
520 (1146.4)	1000 (2204.6)				
81 (3.2)	102 (4.0)				
695 (27.4)	630 (24.8)			695 (27.4)	630 (24.8)
300 (±150) (11.8 (±5.9))					
1585 (62.4)		2585 (101.8)	1585 (62.4)		2585 (101.8)
1540 (60.6)	1562 (61.5)	2500 (98.4)	1605 (63.2)	1540 (60.6)	2500 (98.4)
240 (±120)					
360 / 360					
235 / 1540 (9.3 / 60.6)	-	-	-	235 / 1540 (9.3 / 60.6)	-
48 (1889.8)					
36 (1417.3)					
48 (1889.8)	48 (1889.8)	30 (1181.1)	48 (1889.8)		30 (1181.1)
30 (1181.1)	-	-	30 (1181.1)		
40					
200 / 200					
24 / 36 (944.9 / 1417.3)	-	-	-	24 / 36 (944.9 / 1417.3)	-
4000	3000				
26/22 (34.9/29.5)	30/25 (40.2/33.5)				
A2-8	A2-11				
130 (5.1)	160 (6.3)				
91 (3.6)	115 (4.5)				
0.0001	0.0001				
4000	-	-	4000		
26/22 (34.9/29.5)	-	-	26/22 (34.9/29.5)		
A2-8	-	-	A2-8		
130 (5.1)	-	-	130 (5.1)		
91 (3.6)	-	-	91 (3.6)		
0.001	-	-	0.001		
12000 {8000}*					
26/18.5/15 (34.9/24.8/20.1)					
0.0001					
40 {80/120}*	40 {80}*			40 {80/120}*	40 {80}*
CAPTO C6 {HSK-A63}*					
90 (3.5)					
130 (5.1)					
450 (17.7)					
12 (26.5)					
9.8 (7.2)					
1.8					
7.8					
12	-			12	-
25 (1.0)	-			25 (1.0)	-
40 (1.6)	-			40 (1.6)	-
0.2	-			0.2	-
5000	-			5000	-
-	-	{3}*	-		{3}*
-	-	{Ø60 x L600 or Ø30 x L800 (Ø2.4 x L23.6 or Ø1.2 x L31.5)}*	-		{Ø60 x L600 or Ø30 x L800 (Ø2.4 x L23.6 or Ø1.2 x L31.5)}*
-	-	{15}*	-		{15}*
-	#5	#5	-		
-	1562 (61.5)	2500 (98.4)	-		
2.2 (3.0)					
99.93	67.61	74.25	94.71	103.93	99.44
2820 (111.0)	2750 (108.3)	2850 (112.2)	2850 (112.2)	2820 (111.0)	2850 (112.2)
4900 (192.9)	4900 (192.9)	6400 (252.0)	4900 (192.9)	4900 (192.9)	6400 (252.0)
3021 (118.9)	3011 (118.5)	3011 (118.5)	3011 (118.5)	3021 (118.9)	3011 (118.5)
18000 (39682.6)	16300 (35934.8)	20100 (44312.3)	16700 (36816.7)	18500 (40784.9)	20500 (45194.1)
FANUC31i {FANUC31i-5 / SIEMENS 840D*** / CUFOS}*					

* { } : Optimal

** A-axis is travel of servo tail stock in PUMA SXM2600, 3100/L and travel of right spindle in PUMA SMX2600S/ST, 3100S/ST/LS. *** Except PUMA SMX2600ST/3100ST

NC Unit Specification

FANUC 31i/31i-5

● Standard ○ Optional X Not applicable

No.	Item		Spec.	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST
				Fanuc 31i				Fanuc 31i-5	
1	Controlled axis	Controlled axes		6 (X, Z, C, B, Y, A)	7 (X1, Z1, C1, B, Y, A, C2)	9 (X1 ,Z1, C1, Y, B, X2, Z2, C2, A)	6 (X, Z, C, B, Y, A)	7 (X1, Z1 ,C1, B, Y, A, C2)	9 (X1, Z1, C1, Y, B, X2, Z2, C2, A)
2		Simultaneously controlled axes		4 axes	4 axes	4 axes	5 axes	5 axes	5 axes
3		Synchronous/Composite control (C1 & C2 Synchro Control)		X	●	●	X	●	●
4		Inch/metric conversion		●	●	●	●	●	●
5		Stored stroke check 1		●	●	●	●	●	●
6		Unexpected disturbance torque detection function		●	●	●	●	●	●
7	Operation	DNC operation with memory card		●	●	●	●	●	●
8		Tool retract and recover		○	○	○	○	○	○
9		Dry run		●	●	●	●	●	●
10		Single block		●	●	●	●	●	●
11		Handle interruption		○	○	○	○	○	○
12		Incremental feed	x1, x10, x100, x1000	●	●	●	●	●	●
13		Manual handle retrace		○	○	○	○	○	○
14		Active block cancel		○	○	○	○	○	○
15	Interpolation functions	Nano interpolation		●	●	●	●	●	●
16		Linear interpolation		●	●	●	●	●	●
17		Circular interpolation	G02	●	●	●	●	●	●
18		Polar coordinate interpolation		●	●	●	●	●	●
19		Cylindrical interpolation		●	●	●	●	●	●
20		Helical interpolation		●	●	●	●	●	●
21		Thread cutting, synchronous cutting		●	●	●	●	●	●
22		Multi threading		●	●	●	●	●	●
23		Thread cutting retract		●	●	●	●	●	●
24		Continuous threading		●	●	●	●	●	●
25		Variable lead thread cutting		○	○	○	○	○	○
26		Circular thread cutting		○	○	○	○	○	○
27		Polygon machining with two spindles		●	●	●	●	●	●
28		High-speed skip	Input signal is 8 points.	○	○	○	○	○	○
29		3rd/4th reference position return		●	●	●	●	●	●
30		Balanced cutting	Only for more than 2 path control	X	X	X	X	X	X
31	Feed function	Override cancel		●	●	●	●	●	●
32	Program input	Absolute/incremental programming	Combined use in the same block	●	●	●	●	●	●
33		Diameter/Radius programming	X-axis	●	●	●	●	●	●
34		Dynamic switching of diameter/ radius specification		○	○	○	●	●	●
35		Automatic coordinate system setting		●	●	●	●	●	●
36		Workpiece coordinate system	G52 - G59	●	●	●	●	●	●
37		Workpiece coordinate system preset		○	○	○	○	○	○
38		Addition of workpiece coordinate system	48 pairs	○	○	○	○	○	○
39		Addition of workpiece coordinate system	300 pairs	○	○	○	○	○	○
40		Direct drawing dimension programming		●	●	●	●	●	●
41		G code system	A	●	●	●	●	●	●

● Standard ○ Optional X Not applicable

No.	Item		Spec.	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST
				Fanuc 31i				Fanuc 31i-5	
42	Program input	G code system	B/C	●	●	●	●	●	●
43		Chamfering/Corner R		●	●	●	●	●	●
44		Custom macro		●	●	●	●	●	●
45		Addition of custom macro common variables	#100 - #199, #500 - #999	●	●	●	●	●	●
46		Interruption type custom macro		○	○	○	○	○	○
47		Canned cycle		●	●	●	●	●	●
48		Automatic corner override		○	○	○	○	○	○
49		3-dimensional coordinate system conversion		●	●	●	●	●	●
50		Macro executor		●	●	●	●	●	●
51		Macro executor + C language executor		X	X	●	X	X	●
52		Coordinate system shift		●	●	●	●	●	●
53		Direct input of coordinate system shift		●	●	●	●	●	●
54		Real time custom macro		○	○	○	○	○	○
55		Pattern data input		○	○	○	○	○	○
56	Operation Guidance Function	Easy Operation package		●	●	●	●	●	●
57		EZ Guidei(Conversational Programming Solution)		●	●	●	●	●	●
58	Auxiliary/ Spindle speed function	Constant surface speed control		●	●	●	●	●	●
59		Spindle override	0 - 150%	●	●	●	●	●	●
60		Spindle orientation		●	●	●	●	●	●
61		Spindle synchronous control		X	●	●	X	●	●
62		Rigid tap		●	●	●	●	●	●
63		Arbitrary speed threading		○	○	○	○	○	○
64	Tool function / Tool compensation	Tool offset pairs	400-pairs	●	●	●	●	●	●
65		Tool offset pairs	499-pairs	○	○	○	○	○	○
66		Tool offset pairs	999-pairs	○	○	○	○	○	○
67		Tool offset		●	●	●	●	●	●
68		Tool center point control		X	X	X	X	X	X
69		Smooth TCP		X	X	X	●	●	●
70		Y-axis offset		●	●	●	●	●	●
71		Tool radius/Tool nose radius compensation		●	●	●	●	●	●
72		Tool geometry/wear compensation		●	●	●	●	●	●
73		Automatic tool offset	G36/G37	●	●	●	●	●	●
74		Direct input of offset value measured B		●	●	●	●	●	●
75		Tool life management		●	●	●	●	●	●
76	Accuracy compensation function	Backlash compensation for each rapid traverse and cutting feed		●	●	●	●	●	●
77		Stored pitch error compensation		●	●	●	●	●	●
78	Editing operation	Part program storage size & Number of registerable programs	1280M(512KB)_1000 programs	●	●	●	●	●	●
79			2560M(1MB)_1000 programs	○	○	○	○	○	○
80			5120M(2MB)_1000 programs	○	○	○	○	○	○
81			10240M(4MB)_1000 programs	○	○	○	○	○	○
82			20480M(8MB)_1000 programs	○	○	○	○	○	○
83			2560M(1MB)_2000 programs	○	○	○	○	○	○
84			5120M(2MB)_4000 programs	○	○	○	○	○	○
85			10240M(4MB)_4000 programs	○	○	○	○	○	○
86			20480M(8MB)_4000 programs	○	○	○	○	○	○
87		Program protect		●	●	●	●	●	●
88		Password function		●	●	●	●	●	●
89		Playback		○	○	○	○	○	○
90		Memory card program edit & operation	Max 63 programs	●	●	●	●	●	●
91	Data input / output	data server		○	○	○	○	○	○
92		External data input		●	●	●	●	●	●
93		Memory card input/output		●	●	●	●	●	●
94		USB memory input/output		●	●	●	●	●	●
95		Automatic data backup		●	●	●	●	●	●
96	Interface function	Embedded Ethernet		●	●	●	●	●	●
97		Fast Ethernet		○	○	○	○	○	○
98	Others	Display unit	15" color LCD	●	●	●	●	●	●
99	PMC System	PMC ladder function	64000 steps	X	X	●	X	X	●
100		1st level execution cycle of ladder	4ms	●	●	●	●	●	●
101	Robot interface	Robot interface with PMC I/O module		○	○	○	○	○	○
102		Robot interface with PROFIBUS-DP		○	○	○	○	○	○

NC Unit Specification

SIEMENS S840D

● Standard ○ Optional X Not applicable

No.	Item		Spec.	S840D (5 axes) PUMA SMX2600/3100 series (without Lower turret)
1	Controlled axis	Controlled axes	Normal type for Multi-tasking machine	X1, Z1, Y1, B1, C1, C3, W1, MG1, MG2, ARM,SH
2			S-type for Multi-tasking machine	X1, Z1, Z3, Y1, B1, C1, C2, C3, W1, MG1, MG2, ARM,SH
3		Additional controlled axes	Max. 31 axes in total(S840Dsl) /Max. 8 axes in total(S828D)	○
4		Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 5 axes Circular interpolation(G02, G03) : 2 axes	●
5		Backlash compensation		●
6		Leadscrew error compensation		●
7		Measuring system error compensation		●
8		Feedforward control	velocity-dependent	●
9		Follow up mode		●
10		Programmable acceleration		●
11		Emergency stop / overtravel		●
12		Least command increment	0.001mm (0.0001 inch)	●
13		Least input increment	0.001mm (0.0001 inch)	●
14		Maximum commandable value	±99999.999mm (±3937 inch)	●
15		Machine lock (PRT)		●
16		Position switching signals/cam controller		●
17		Absolute encoder		●
18		Travel to fixed stop with Force Control		●
19	Interpolation & Feed functions	Reference point return	G75 FP=1	●
20		2nd reference point return	G75 FP=2	●
21		3rd / 4th reference return	G75 FP=3, 4	●
22		Linear interpolation	Max. 4	●
23		Circular interpolation	G02, G03	●
24		Inverse time feedrate	G93	●
25		Helical interpolation		●
26		Universal interpolator NURBS		●
27		Spline interpolation (A, B and C splines)		●
28		Dwell	G04	●
29		Separate path feed for corners and chamfers		●
30		Reposition		●
31		Acceleration with Jerklimitation		●
33		Compressor for 5-axis machining		●
34		Temperature compensation		●
35		Couplings	CP-Basic	●
36			CP-Expert	●

● Standard ○ Optional X Not applicable

No.	Item		Spec.	S840D (5 axes) PUMA SMX2600/3100 series (without Lower turret)
37	Spindle function	Spindle override	50 - 120 %	●
38		Automatic gear state selection		●
39		Oriented spindle stop		●
40		Retraction for rigid tapping		●
41	Tool function	Tool radius compensations in plane		
42		3D Tool radius compensation	incloded in MDynamics 5-axis	○
43		Number of tools/cutting edges in tool list		600/1500
44		Tool length compensation		●
45		Operation with tool management		●
46		Monitoring of tool life and workpiece count		●
47		Magazine list		●
48	Programming & Editing operation	Number of levels for skip blocks 1		●
49		Number of levels for skip blocks 8		○
50		Program functions		
51		• Dynamic preprocessing memory FIFO		●
52		Program editor		
53		• Programming graphics/free contour input (contour calculator)		●
54		• Screens for 1/2/3-point contours (contour definition programming)		●
55		• Support for parameter input Animated Elements		●
56		• ShopTurn/ShopMill Machining step programming		●
57		Technology cycles for drilling/milling		●
58	Others function (Operation, setting & Display, etc)	JOG		
59		• Handwheel selection		●
60		• Switchover: inch/metric		●
61		• Manual measurement of zero/work offset		●
62		• Manual measurement of tool offset		●
63		• Automatic tool/workpiece measurement		●
64		• Reference point approach, automatic/via CNC program		●
65		Automatic		
66		• Execution from USB or CF card interface on operator panel front		●
67		• Execution from HMI memory on NCU CF card		●
68		• Execution from network drive		○
69		• Execution from Hard disk (PCU50.5)		○
70		Preset		
71		19.0" color display		●
72		Operating software languages		
73		Alarms and messages		●
74		Remote Control System (RCS) remote diagnostics		
75		Measuring, Measuring stage 1 Two probes (switching) with/without deletion of distance-to-go		●
76		Measuring stage 2 • Axial measurement • Measurements from synchronized actions • Cyclic measuring		○
77		Measuring cycles for drilling/milling and turning • Calibrating workpiece probes • Workpiece measurement • Tool measuring		●
78		Contour handwheel		●
79		Integrate screens in SINUMERIK Operate with SINUMERIK Integrate Run MyScreens		●
80		Cross-mode actions (ASUPs and synchronized actions in all operating modes)		●
81		Collision avoidance (machine, working area)	It is valid in only 1CH	●
82		MDynamics 5-axis		●

NC Unit Specification

CUFOS

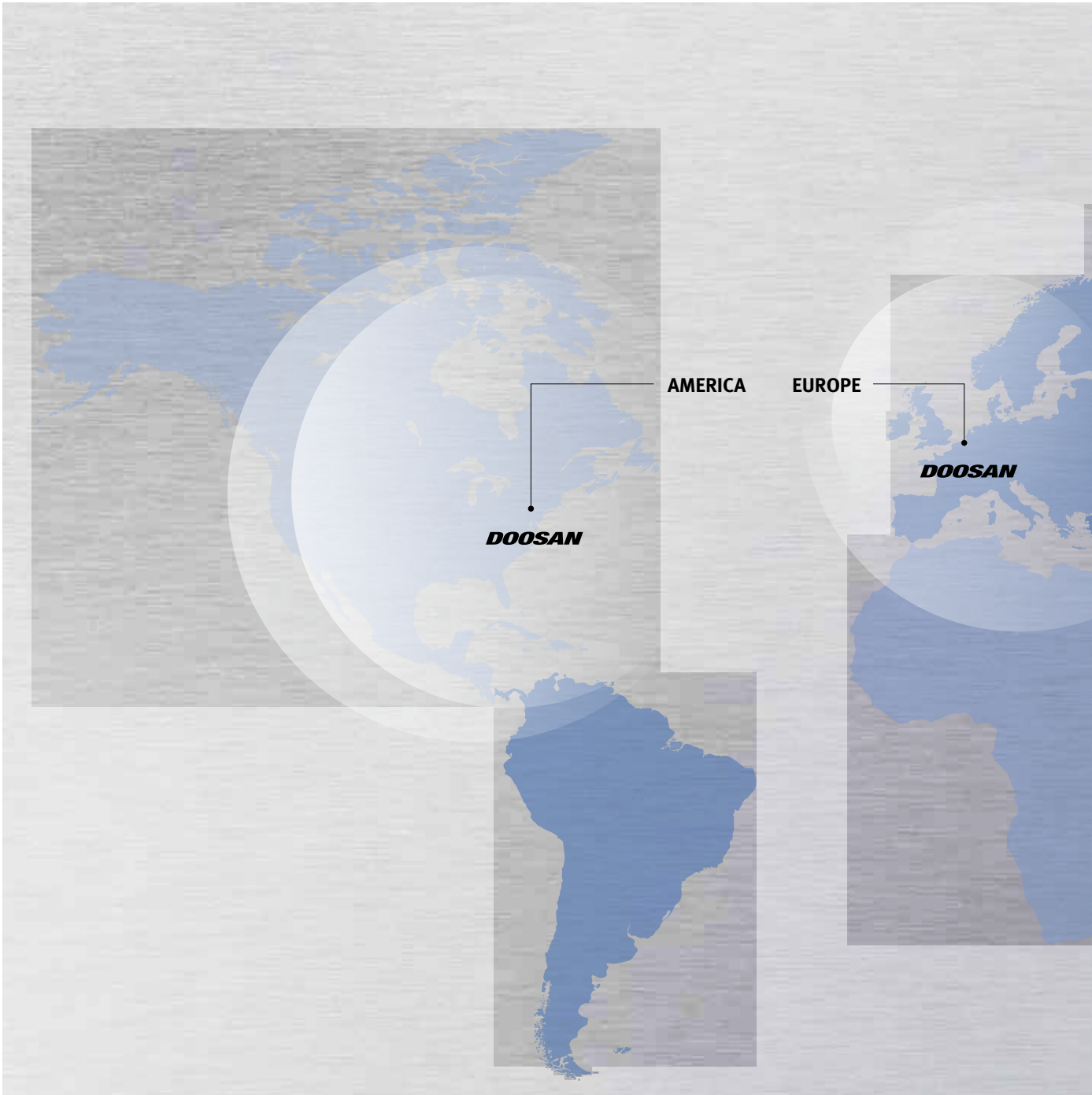
● Standard ○ Optional X Not applicable

No.	Item		Spec.	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST
				Fanuc 31i				Fanuc 31i-5	
1	Controlled axis	Controlled axes		6 (X, Z, C, B, Y, A)	7 (X1, Z1, C1, B, Y, A, C2)	9 (X1 ,Z1, C1, Y, B, X2, Z2, C2, A)	6 (X, Z, C, B, Y, A)	7 (X1, Z1 ,C1, B, Y, A, C2)	9 (X1, Z1, C1, Y, B, X2, Z2, C2, A)
2		Simultaneously controlled axes		4 axes	4 axes	4 axes	5 axes	5 axes	5 axes
3		Synchronous/Composite control		X	●	●	X	●	●
4		Inch/metric conversion		●	●	●	●	●	●
5		Stored stroke check 1		●	●	●	●	●	●
6		Unexpected disturbance torque detection function		●	●	●	●	●	●
7	Operation	DNC operation with memory card		●	●	●	●	●	●
8		Tool retract and recover		○	○	○	○	○	○
9		Dry run		●	●	●	●	●	●
10		Single block		●	●	●	●	●	●
11		Handle interruption		○	○	○	○	○	○
12		Incremental feed	x1,x10,x100	●	●	●	●	●	●
13		Manual handle retrace		○	○	○	○	○	○
14		Active block cancel		○	○	○	○	○	○
15	Interpolation functions	Nano interpolation		●	●	●	●	●	●
16		Linear interpolation		●	●	●	●	●	●
17		Circular interpolation	G02	●	●	●	●	●	●
18		Polar coordinate interpolation		●	●	●	●	●	●
19		Cylindrical interpolation		●	●	●	●	●	●
20		Helical interpolation		●	●	●	●	●	●
21		Thread cutting, synchronous cutting		●	●	●	●	●	●
22		Multi threading		●	●	●	●	●	●
23		Thread cutting retract		●	●	●	●	●	●
24		Continuous threading		●	●	●	●	●	●
25		Variable lead thread cutting		○	○	○	○	○	○
26		Circular thread cutting		○	○	○	○	○	○
27		Polygon machining with two spindles		●	●	●	●	●	●
28		High-speed skip	Input signal is 8 points.	○	○	○	○	○	○
29		3rd/4th reference position return		●	●	●	●	●	●
30		Balanced cutting	Only for more than 2 path control	X	X	X	X	X	X
31	Feed function	Override cancel		●	●	●	●	●	●
32	Program input	Absolute/incremental programming	Combined use in the same block	●	●	●	●	●	●
33		Diameter/Radius programming	X-axis	●	●	●	●	●	●
34		Dynamic switching of diameter/ radius specification		○	○	○	●	●	●
35		Automatic coordinate system setting		●	●	●	●	●	●
36		Workpiece coordinate system	G52 - G59	●	●	●	●	●	●
37		Workpiece coordinate system preset		○	○	○	○	○	○
38		Addition of workpiece coordinate system	48 pairs	○	○	○	○	○	○
39		Addition of workpiece coordinate system	300 pairs	○	○	○	○	○	○
40		Direct drawing dimension programming		●	●	●	●	●	●
41		G code system	A	●	●	●	●	●	●
42		G code system	B/C	●	●	●	●	●	●
43		Chamfering/Corner R		●	●	●	●	●	●
44		Custom macro		●	●	●	●	●	●
45		Addition of custom macro common variables	#100 - #199, #500 - #999	●	●	●	●	●	●
46		Interruption type custom macro		○	○	○	○	○	○
47		Canned cycle		●	●	●	●	●	●
48		Automatic corner override		○	○	○	○	○	○
49		3-dimensional coordinate system conversion		●	●	●	●	●	●

● Standard ○ Optional X Not applicable

No.	Item		Spec.	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST	PUMA SMX 2600, 3100/L	PUMA SMX 2600S, 3100S/LS	PUMA SMX 2600ST, 3100ST
				Fanuc 31i				Fanuc 31i-5	
50	Program input	Macro executor		●	●	X	●	●	X
51		Macro executor + C language executor		X	X	●	X	X	●
52		Coordinate system shift		●	●	●	●	●	●
53		Direct input of coordinate system shift		●	●	●	●	●	●
54		Real time custom macro		○	○	○	○	○	○
55	Operation Guidance Function	Pattern data input		○	○	○	○	○	○
56		Easy Operation package		●	●	●	●	●	●
57	Auxiliary/ Spindle speed function	Constant surface speed control		●	●	●	●	●	●
58		Spindle override	0 - 150%	●	●	●	●	●	●
59		Spindle orientation		●	●	●	●	●	●
60		Spindle synchronous control		X	●	●	X	●	●
61		Rigid tap		●	●	●	●	●	●
62		Arbitrary speed threading		○	○	○	○	○	○
63	Tool function / Tool compensation	Tool offset pairs	400-pairs	●	●	X	●	●	X
64		Tool offset pairs	499-pairs	○	○	●	○	○	●
65		Tool offset pairs	999-pairs	○	○	○	○	○	○
66		Tool offset		●	●	●	●	●	●
67		Tool center point control		X	X	X	X	X	X
68		Smooth TCP		X	X	X	●	●	●
69		Y-axis offset		●	●	●	●	●	●
70		Tool radius/Tool nose radius compensation		●	●	●	●	●	●
71		Tool geometry/wear compensation		●	●	●	●	●	●
72		Automatic tool offset		●	●	●	●	●	●
73		Direct input of offset value measured B		●	●	●	●	●	●
74		Tool life management		●	●	●	●	●	●
75	Accuracy compensation function	Backlash compensation for each rapid traverse and cutting feed		●	●	●	●	●	●
76		Stored pitch error compensation		●	●	●	●	●	●
77	Editing operation	Part program storage size & Number of registerable programs	1280M(512KB)_1000 programs	●	●	●	●	●	●
78			2560M(1MB)_1000 programs	○	○	○	○	○	○
79			5120M(2MB)_1000 programs	○	○	○	○	○	○
80			10240M(4MB)_1000 programs	○	○	○	○	○	○
81			20480M(8MB)_1000 programs	○	○	○	○	○	○
82			2560M(1MB)_2000 programs	○	○	○	○	○	○
83			5120M(2MB)_4000 programs	○	○	○	○	○	○
84			10240M(4MB)_4000 programs	○	○	○	○	○	○
85			20480M(8MB)_4000 programs	○	○	○	○	○	○
86		Program protect		●	●	●	●	●	●
87		Password function		●	●	●	●	●	●
88		Playback		○	○	○	○	○	○
89		Memory card program edit & operation	Max 63 programs	●	●	●	●	●	●
90	Data input / output	data server		○	○	○	○	○	○
91		External data input		●	●	●	●	●	●
92		Memory card input/output		●	●	●	●	●	●
93		USB memory input/output		●	●	●	●	●	●
94		Automatic data backup		●	●	●	●	●	●
95	Interface function	Embedded Ethernet		●	●	●	●	●	●
96		Fast Ethernet		○	○	○	○	○	○
97	Robot interface	Robot interface with PMC I/O module		○	○	○	○	○	○
98		Robot interface with PROFIBUS-DP		○	○	○	○	○	○
99	CUFOS	Display Unit	19" Color LCD Screen, 2 Point-touch	●	●	●	●	●	●
100		Main RAM Memory	4GB	●	●	●	●	●	●
101		Storage Memory	SSD 32GB	●	●	●	●	●	●
102			SSD 64GB	○	○	○	○	○	○
103			SSD 128GB	○	○	○	○	○	○
104		Doosan Tool Management for SMX		○	○	○	○	○	○
105		Collison Protection System	When this item is selected, The size of RAM and SSD are automatically expanded to 8GB and 64GB, respectively.	○	○	○	○	○	○
106		SSD Data server Application	5GB	●	●	●	●	●	●
107			20GB	○	○	○	○	○	○
108			40GB	○	○	○	○	○	○
109		Manager's Message Notification application		●	●	●	●	●	●
110		FTP Server service		●	●	●	●	●	●
111		Smart key access control application		○	○	○	○	○	○
112		Memo Application		●	●	●	●	●	●
113		Machine status Monitor application		●	●	●	●	●	●
114		Alarm guidance application		●	●	●	●	●	●
115		Manual viewer Application		●	●	●	●	●	●
116		Calendar Application		●	●	●	●	●	●
117		Browser Application		●	●	●	●	●	●
118		Maintenace Manager Application		●	●	●	●	●	●
119		Data Logger Application		●	●	●	●	●	●
120		Servo viewer Application		●	●	●	●	●	●

Responding to Customers Anytime, Anywhere



Global Sales and Service Support Network

Corporations	Dealer Networks	Technical Centers	Service Post	Factories
4	164	51	198	3

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.

Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

PUMA SMX series

Description	Unit	PUMA SMX2600	PUMA SMX3100/L	PUMA SMX 2600S/ ST	PUMA SMX3100S/ LS/ST
Chuck (Left spindle)	inch	10 {12}*	12 {15}*	10 {12}*	12 {15}*
Chuck (Right spindle)	inch	-		10 {12}*	
Max. turning diameter	mm (inch)	660 (26.0)			
Max. turning length	mm (inch)	1540 (60.6) [SMX3100L/LS : 2540(100)]			
Spindle speed	r/min	4000	3000	Left / Right : 4000	Left : 3000 Right : 4000
Motor power	kW (Hp)	26/22 (34.9/29.5)	30/25 (40.2/33.5)	26/22 (34.9/29.5)	30/25 (40.2/33.5)

*{ } Option

Doosan Machine Tools

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* For more details, please contact Doosan Machine Tools.
* The specifications and information above-mentioned may be changed without prior notice.
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Fire Safety Precautions | There is a high risk or fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting use coolants and modifying the machine without the consent of the manufacturer. Please check the SAFETY GUIDANCE carefully before using the machine.

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