

DOOSAN



PUMA 1000 series

Large-sized Big Bore Heavy Duty
Turning Center with Upto 560mm
Spindle Bore



PUMA 1000 series

PUMA 1000A/MA

PUMA 1000B/MB



**MACHINE
GREATNESS™**

Basic Information

Basic Structure

Detailed Information

Options
Applications
Capacity Diagram
Specifications

Customer Support Service



PUMA 1000 series

The PUMA 1000 Series is DOOSAN's largest horizontal turning center, optimized for pipe & flange parts in the oil & gas industry, hydraulic components for construction machinery, aerospace and shipbuilding industry. It ensures powerful machining capability by using a 2 step gearbox and high torque motors together with a rigid box guideway structure. Especially new designed high rigid servo-driven turret is adopted to ensure more faster & stable tool rotation and machining stability in heavy-duty cutting and milling.

Contents

02 Product Overview

Basic Information

04 Basic Structure

Detailed Information

07 Standard / Optional Specifications

09 Applications

10 Capacity Diagram

15 Machine / NC Unit Specifications

18 Customer Support Service



*PUMA 1000M with optional equipment.

Perfect specification for machining large workpieces.

Machining of large parts and powerful cutting in various industries with max. turning dia. \varnothing 1000 mm, machining length 2000 mm and max. spindle torque 12040 N·m.

Offering various sizes of pipe machining solutions

- Max. \varnothing 560 mm (\varnothing 22.0 inch) of big spindle through hole (bore) allow working on shafts and other parts that are longer than the distance between centers.
- PUMA 1000series are capable of threading work.

Improved productivity

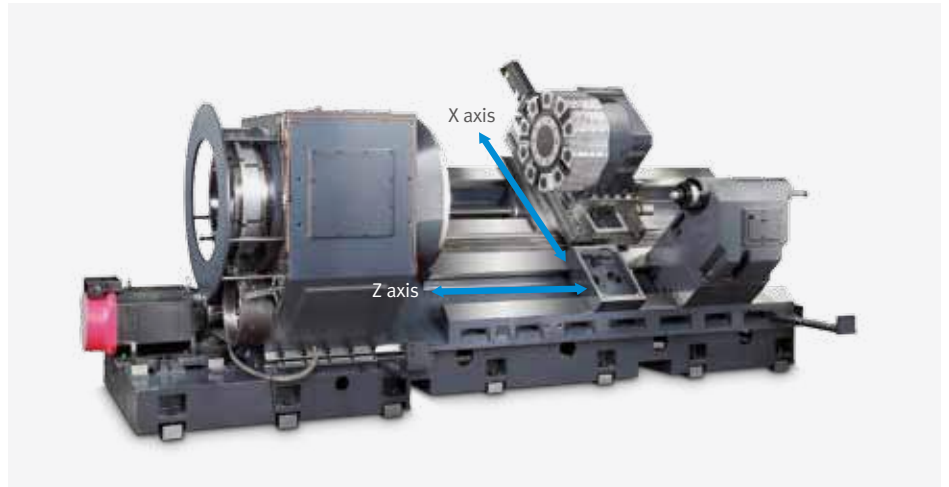
Turret indexing is possible even with a long boring bar (\varnothing 100xL1000 mm) mounted on a newly designed high rigidity turret for improved machining stability and productivity.

Basic Structure

45° slant bed with hardened and ground boxways is made of Meehanite cast iron. The basic structure is designed to minimize deformation in any heavy duty machining.

Structural stability of slant bed and box guideway

PUMA 1000 series has been developed with more than tens years of accumulated engineering know-how in manufacturing large-sized PUMA turning center. Its rigid structural base is to guarantee the stability of heavyduty cutting and easy chip drop.



Machining area

PUMA 1000 series is ideally configured for big bore pipes used typically in the oil and gas industry, or for the production of a variety of large-machine parts.

Spacious working area to machine large-sized workpiece

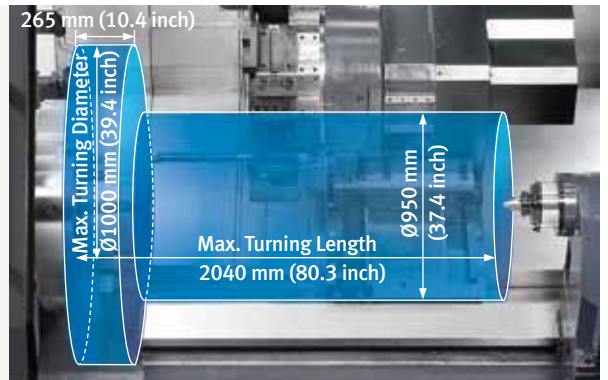
PUMA 1000 series could be applied to big steel rollers, large diameter flanges, long shafts of ships etc, thanks to its big spindle through hole and large swing for big workpiece.

Max. Turning Diameter

Ø1000mm
(Ø39.4 inch)

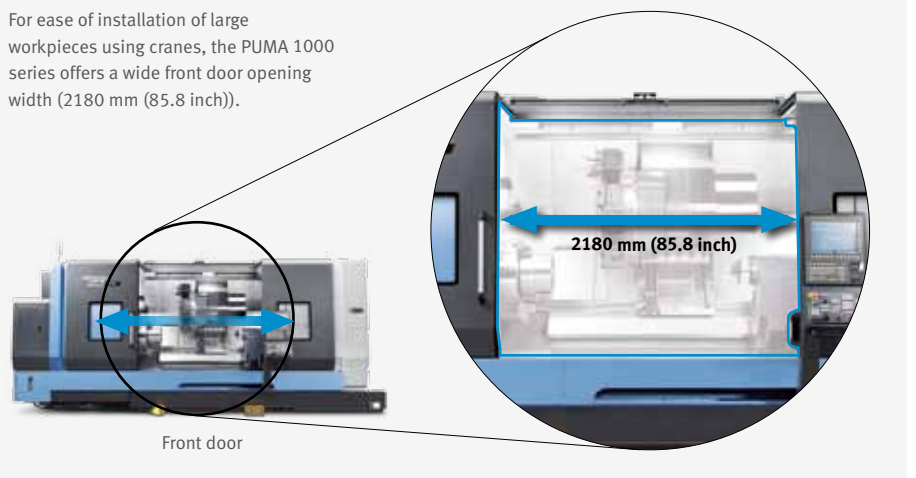
Max. Turning Length*

2040mm
(80.3 inch)



* : Max. turning length can be different depends on a chuck adopted.

For ease of installation of large workpieces using cranes, the PUMA 1000 series offers a wide front door opening width (2180 mm (85.8 inch)).



Spindle

Strong motor power and max. $\varnothing 560$ mm ($\varnothing 22.0$ inch) of big spindle through hole (bore) allow working on shafts and other parts that are longer than the distance between centers, such as an oil drilling shaft.

Extra large diameter of spindle through hole (bore)

The PUMA 1000series has a big spindle through hole upto $\varnothing 560$ ($\varnothing 22''$)mm and powerful spindle of upto 75kW (100.1Hp) with 2-step gear box to ensure the strongest performance.

Max. Spindle Through Hole Diameter

PUMA 1000A/MA [1000B/MB]

$\varnothing 375$ [$\varnothing 560$] mm

($\varnothing 14.8$ [$\varnothing 22.0$] inch)

Max.Spindle Power (30min/cont.)

75/60 kW

(100.6 / 80.5 Hp)

Max. Spindle Speed

PUMA 1000A/MA [1000B/MB]

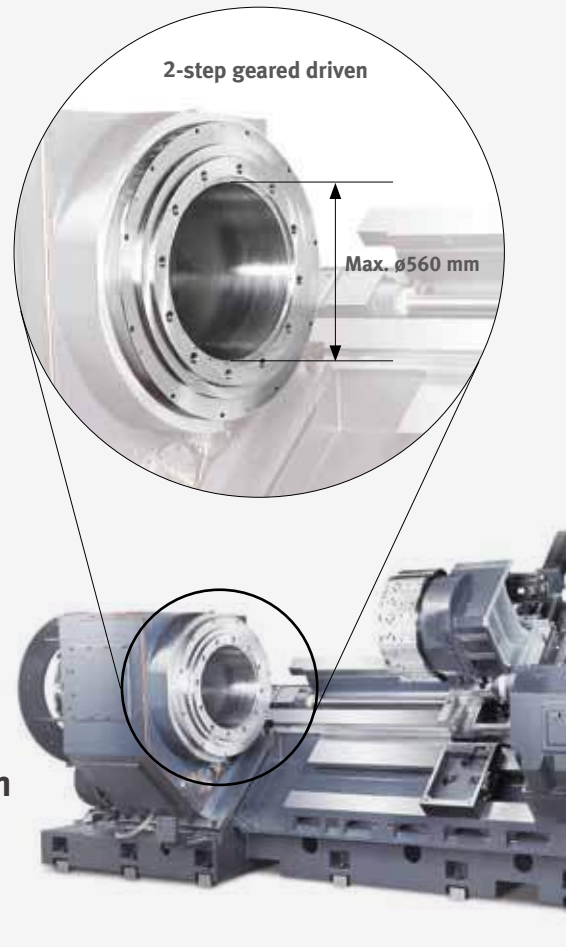
500 [300] r/min

Max. Spindle Torque

PUMA 1000A/MA [1000B/MB]

11011 [12040] N·m

(8126.1 [8885.5] ft·lb)



Tailstock

High rigidity of programmable tailstock is available as standard to provide stable support of long workpieces.

Programmable tailstock with Built-in dead center

The tailstock supported by hardened and ground boxed ways is structurally one-piece with the machine base, which ensures the best structural rigidity. Its built-in type dead center supports heavy workpieces while maintaining machining accuracy.

Tailstock Travel

1900 mm

(74.8 inch)

Quill Travel / Quill Spindle Diameter

150 / $\varnothing 180$ mm

(5.9 / $\varnothing 7.1$ inch)





Turret

Servo-driven and its bigger thickness turret are adopted to ensure more faster & stable tool rotation and machining stability in heavy-duty cutting and milling.

Servo driven turret

The turret rotation and indexing is driven by a powerful servo motor which provides accurate positioning, fast and stable tool change. Comparing to the PUMA 600/700/800 series, turret thickness of PUMA 1000series is increased twofold.

Turret indexing is possible with $\varnothing 100 \times L1000\text{mm}$ ($\varnothing 3.94 \times 39.4$) sized long boring bar in its turret.

No. of Tool Station

PUMA 1000

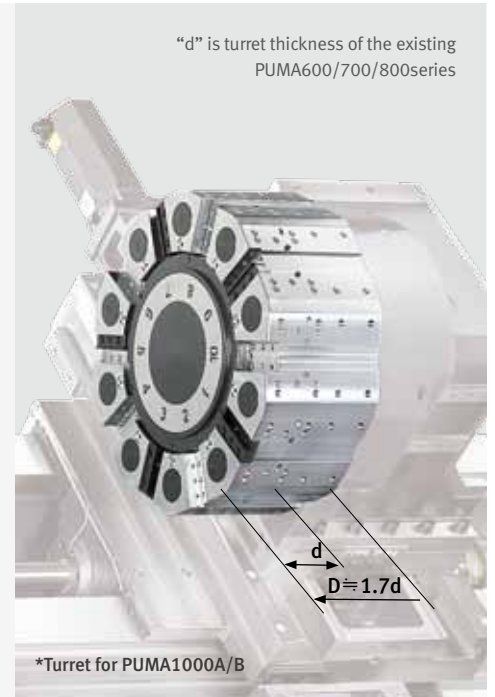
10 stations
(for turning only)

Max. OD Tool Size

32 x 32 mm
(1.25 X 1.25 inch)

Max. Boring Bar Size

$\varnothing 80$ mm
($\varnothing 3.1$ inch)

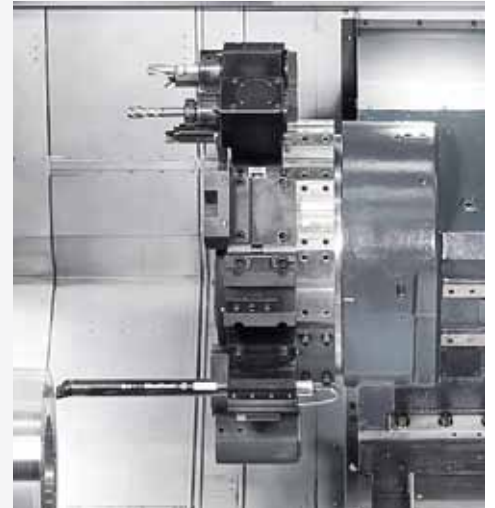
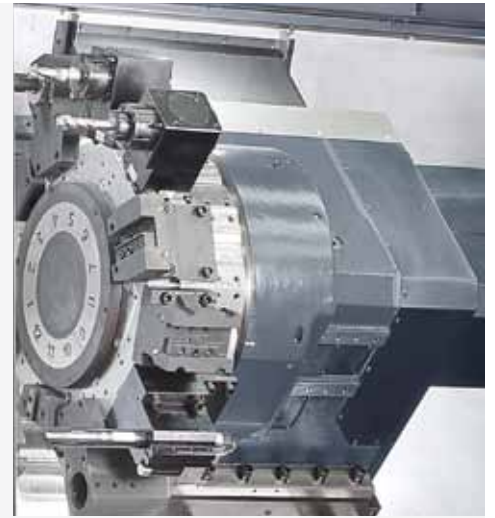


PUMA 1000M

BMT85P

No. of Tool Station

12 stations



Standard / Optional Features

Various options are available to satisfy all the customers' requirements.

● Standard ○ Optional △ Contact DOOSAN X N/A

Description		Features			PUMA1000A	PUMA1000B
					2 axis / M	2 axis / M
1		None			●	●
4	Chuck (Left / Right)	32 Inch			○	X
5		40 Inch			X	△
6	Jaws (Left / Right)	Soft Jaws			○ ^{*1)}	△
7		Hardened & Ground Hard Jaws			○	△
8	Chucking Option	Single Pressure Chucking			●	X
9		Dual Pressure Chucking			○	X
10		Cuck Clamp Confirmation			○	X
13	Steady Rest*	Dimension	Pressure	ø100~ø410 (K5.1Z)	○	○
14				ø135~ø460(K6Z)	○	○
15				ø215~ø510(K6.1Z)	○	○
18		Type (Programmabl)	Single		○	○
19			Twin		○	○
20			Double		○	○
21	Tailstock	Programmable Dead Center			●	●
24	Coolant Pump	4.5 bar			●	●
25		7/10/14.5/28/70 bar			○	○
26	Coolant Options	Oil Skimmer			○	○
27		Coolant Chiller			○	○
28		Coolant Pressure Switch			○	○
29		Coolant level switch : Sensing level - Low			○	○
30		Coolant Gun			○	○
31	Chip Disposal	Chip Conveyor_Side Type			○	○
32		Chip Bucket			○	○
33		Air Blow			○	○
34		Mist Collector Interface (Duct only)			○	○
35		Integrated Mist Collector			○	○
36	Measurement & Automation	Tool Setter	Auto		●	●
38		Auto Door			○	○
39	Optional devices	Tool Load Monitoring			●	●
40		Signal Tower			○	○
41		Air Gun			○	○
42		Auto Power Off			○	○
43		Air Unit for Air Cuck	Single		○	○
44			Twin		○	○
45		Quick change tooling(CAPTO)			○	○
46		Sketch-turn S/W			○	○

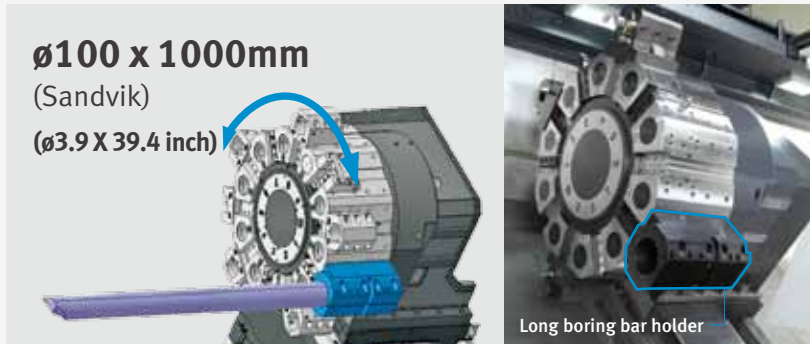
* Please contact DOOSAN to select detailed steady rest specifications

* 1) Each chuck comes with 1set of soft jaws as standard.

Peripheral equipments

Long boring bar option

The long boring bar option allows you to easily machine deep holes to minimize cycle time. Please consult with Doosan specialist for details.



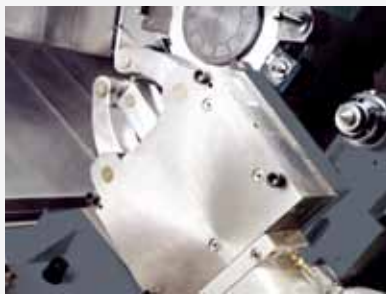
Twin chucking option

For more stable pipe threading process, twin chucking option(manual or pneumatic)is available. Please consult with Doosan specialist for details.



Steady rest option

For turning a part with extensive length, various types of hydraulic steady rests(Single, Double or Twin type) are available.



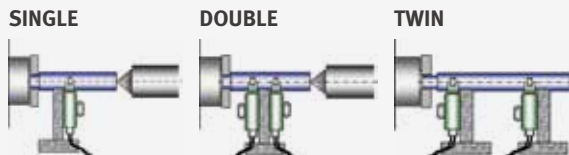
Auto tool setter option

Applicable during shaft machining, the pocket of the chuck cover accommodates the overhang of the tool, minimizing interference and enhancing tool usability.

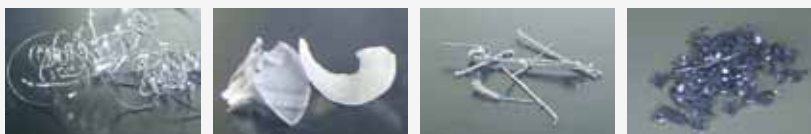


Quick change CAPTO option

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



Chip conveyor (Right side) option



Long Short Needle Sludge

Material		Carbon steel			Cast iron		Aluminium		
		Long	Short	Needle	Short	Sludge	Long	Short	Needle
Chip conveyor type									
Hinged belt type		○	△	X	△	X	○	△	X
Scrapper type	Normal	X	○	△	○	△	X	△	X
	Magnetic	X	○	○	○	○	-	-	-

○ : Suitable, △ : Possible, X : Not suitable

Coolant tank

Doosan's ergonomic roller coolant tank design, allows users to easily replace and refill coolant. Roller on the coolant tank allows users to simply take out and put it back in the machine like a drawer unit.



DOOSAN FANUC i

FANUC CNC is tuned ideally to PUMA 1000 series, in order to maximize productivity.

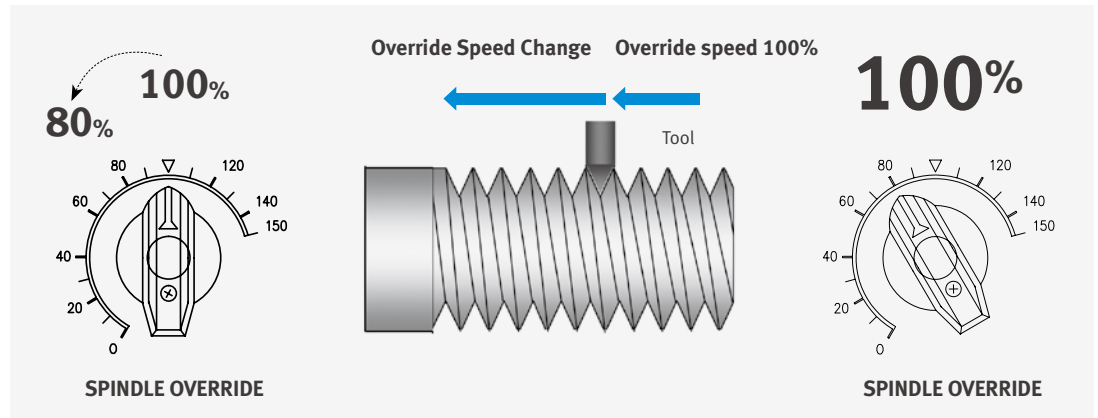
User-friendly operation panel

The newly designed operation panel groups all of the common buttons together to enhance operator's convenience. Also, 'QWERTY' keypad is applied as standard to improve convenience of users who are accustomed to PC keyboards.



Arbitrary Speed Threading

This function allows users to control spindle speed in order to set it at an ideal machining condition to keep the best thread quality.



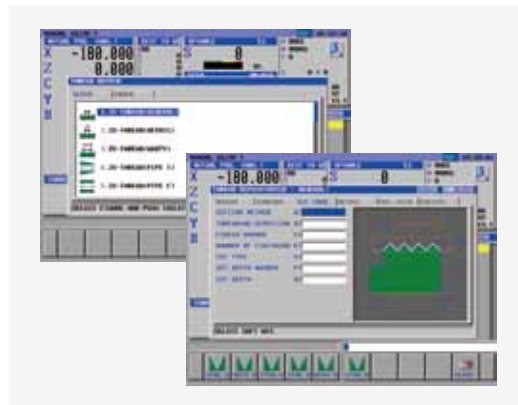
SKETCH-TURN option

DOOSAN Conversational programming software for PC

- Easy to learn for beginners
- Time savings in programming
- Reduce processing cycle time

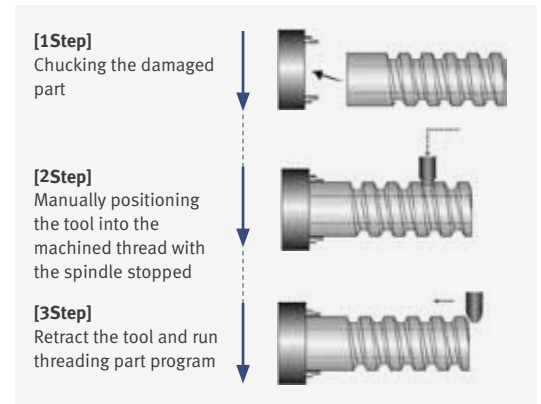
Threading repair function

This function allows users to repair thread even when original program is not available and this is a standard Fanuc NC function.



Re-machining function option

This function allows users to re-machine damaged threads by using the existing program.

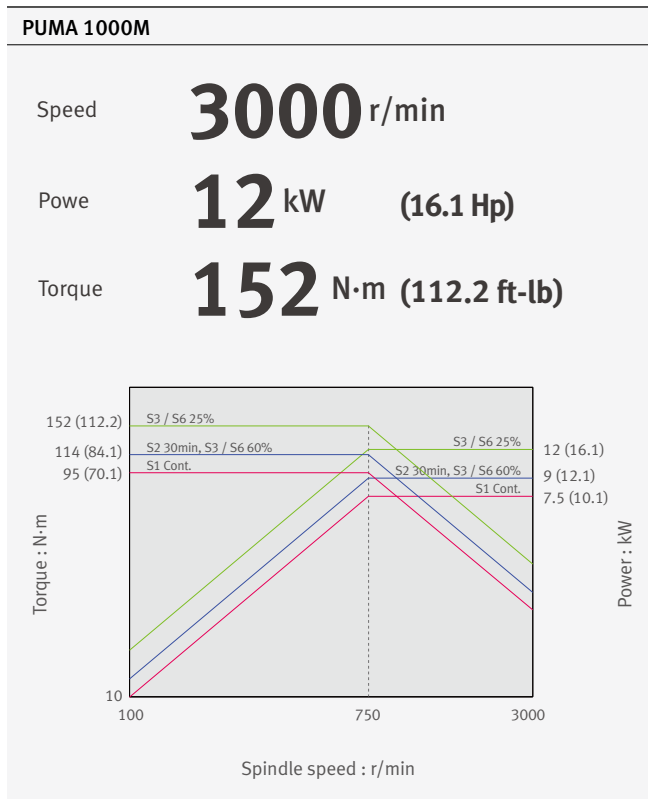


Power-Torque Diagram

Main spindle

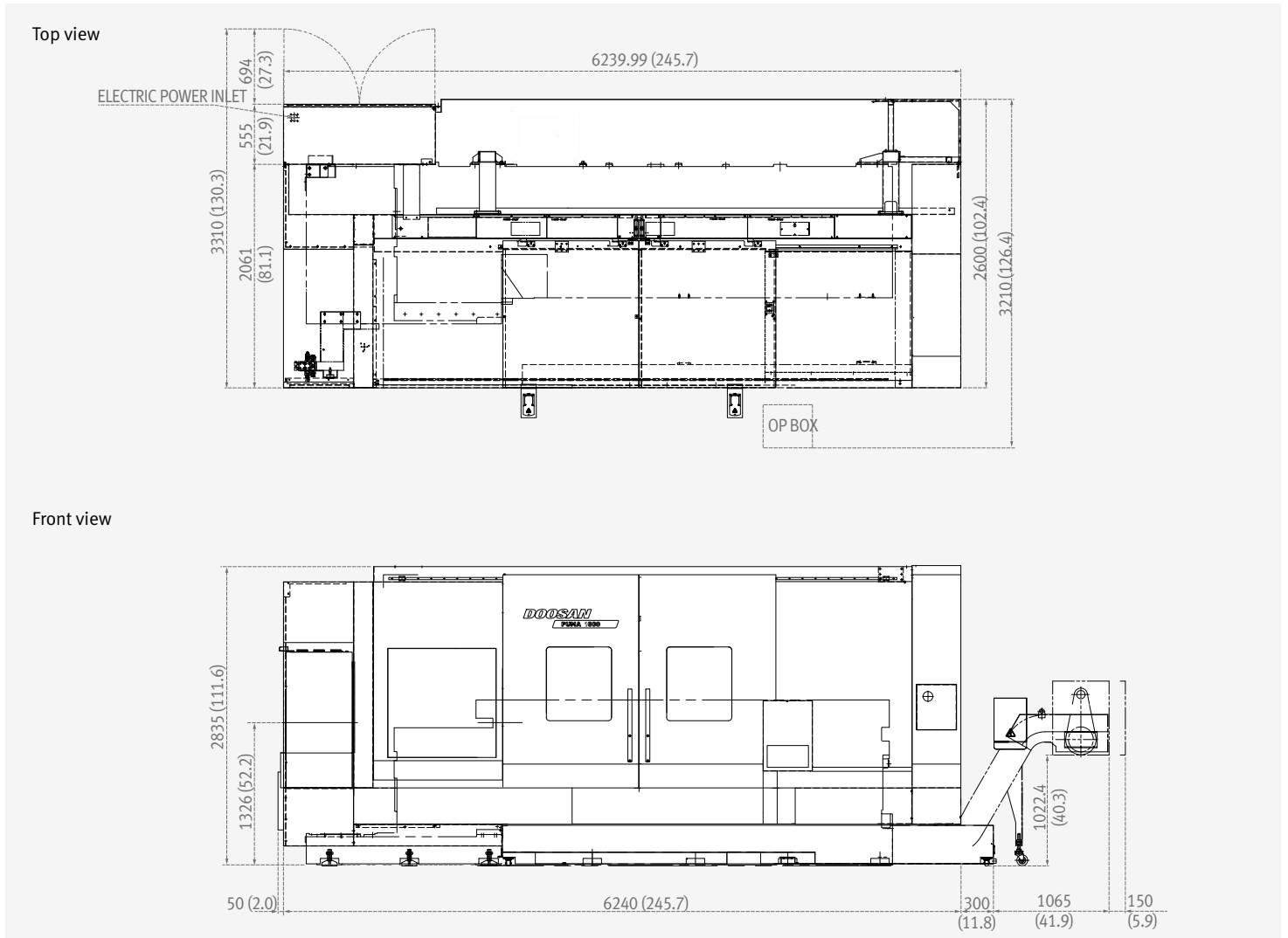


Rotary tool



External Dimensions / Tool Interference Diagram

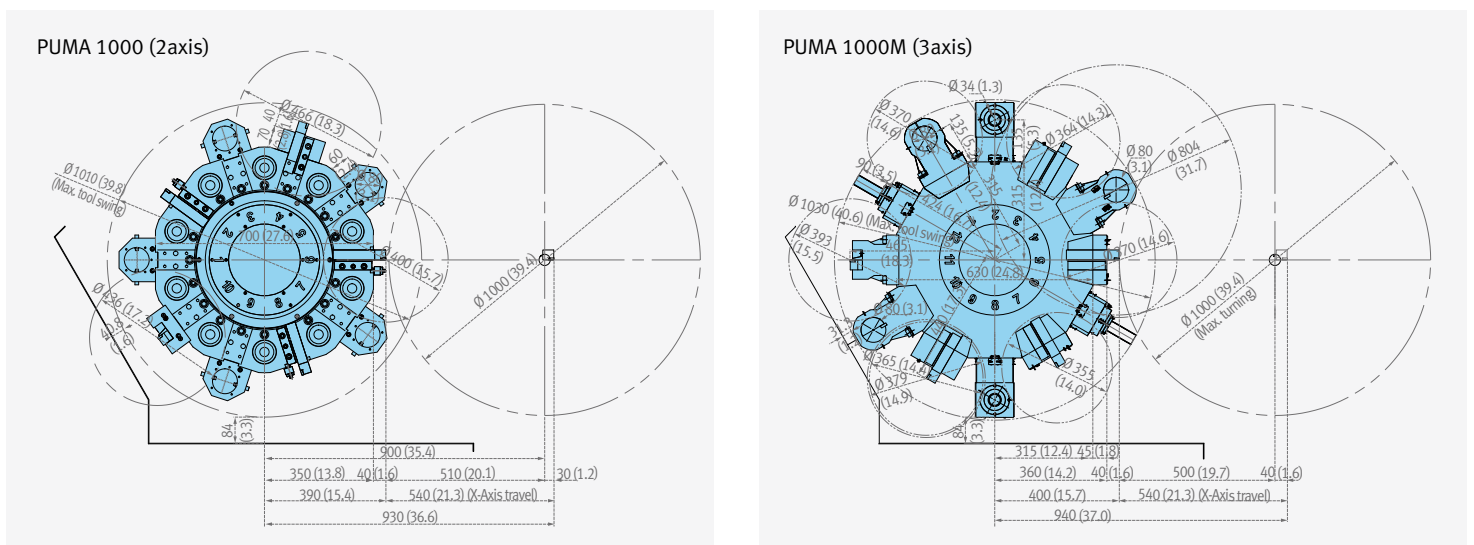
External Dimensions



* Some peripheral equipment can be placed in other places

Tool Interference Diagram

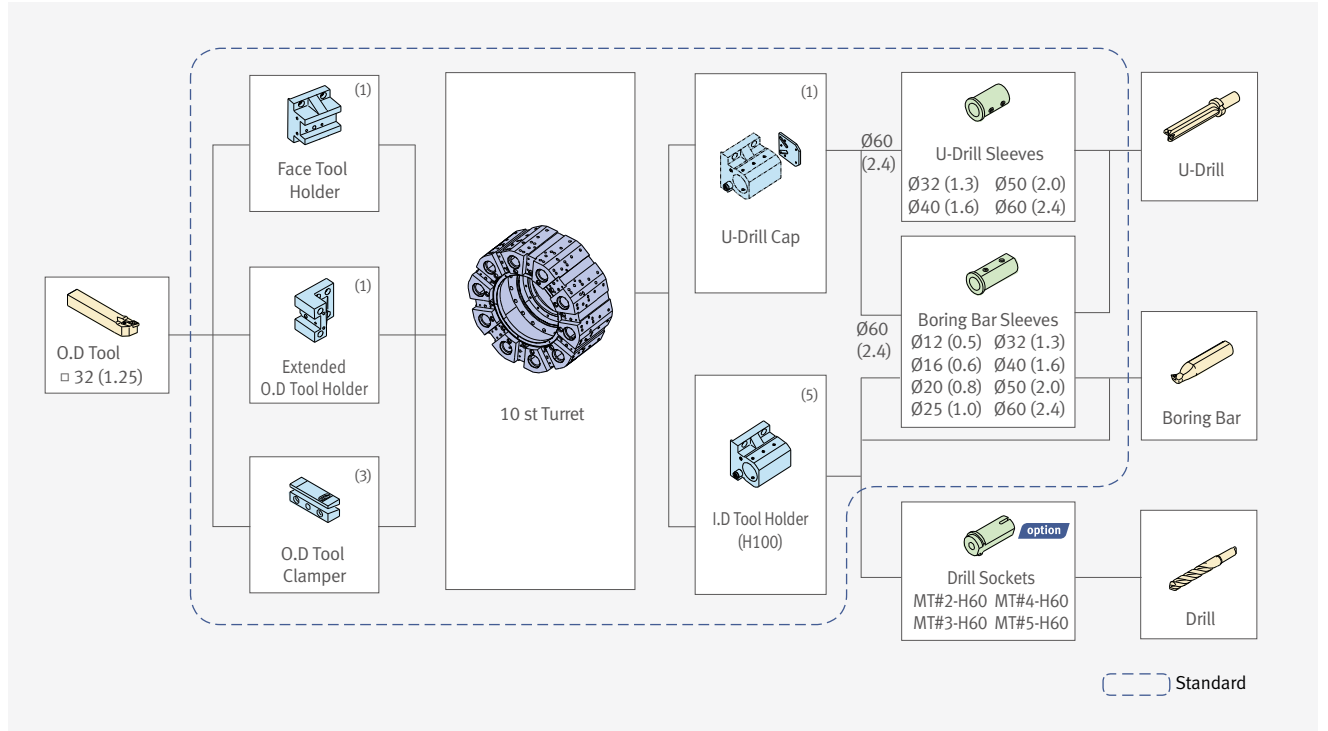
Unit : mm (inch)



Tooling System

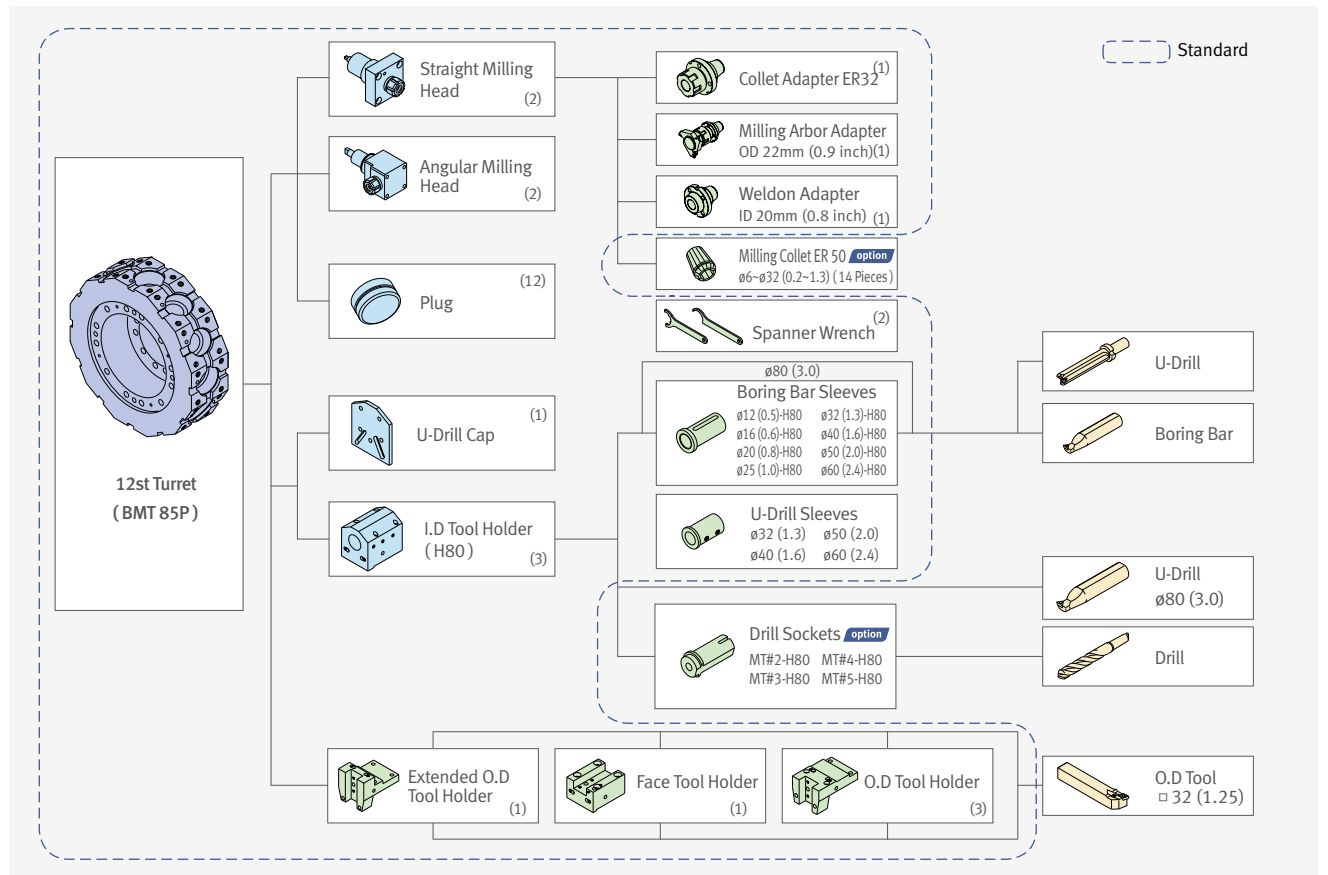
PUMA 1000

Unit : mm (inch)



PUMA 1000M

Unit : mm (inch)

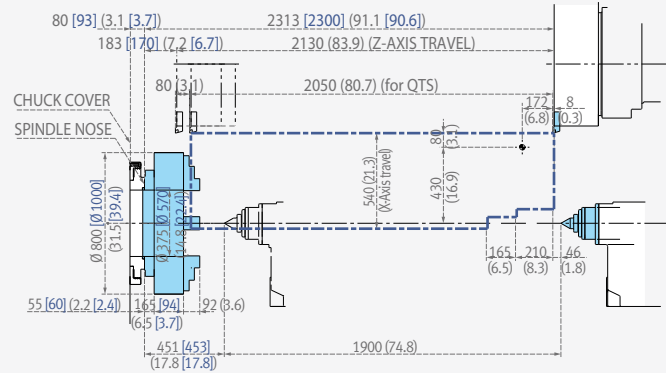


Working Range Diagram

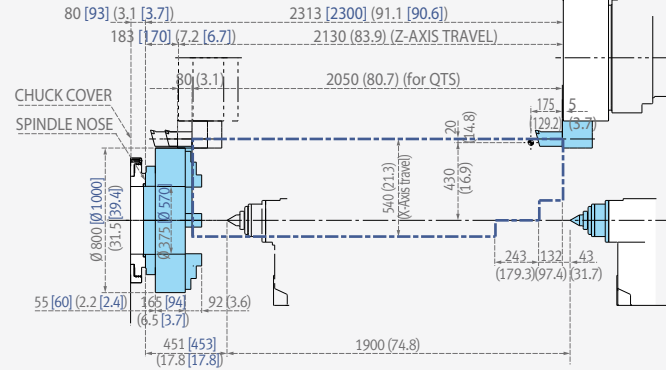
PUMA 1000A / B

Unit : mm (inch)

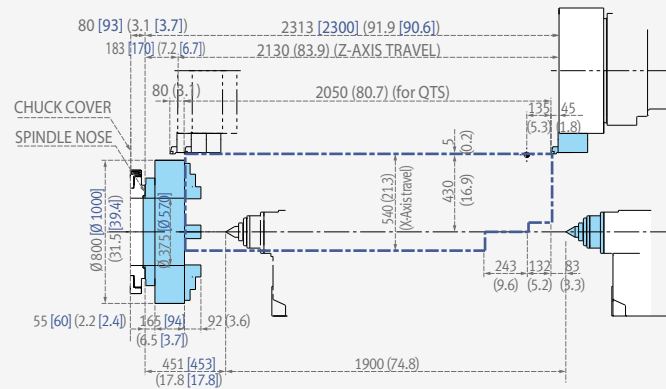
OD Tool Holder



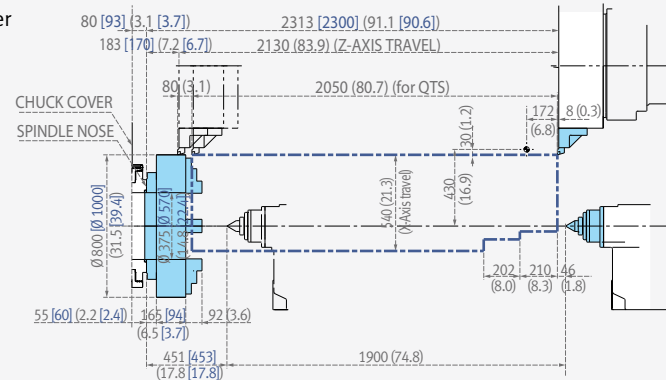
ID Tool Holder



Face Tool Holder



Extende OD Tool Holder



Working Range Diagram

PUMA 1000MA / MB

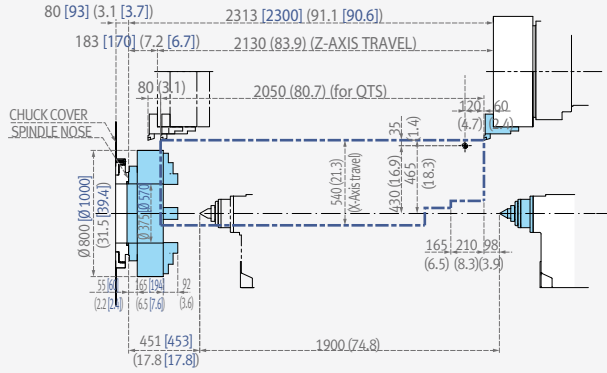
Unit : mm (inch)

Detailed Information

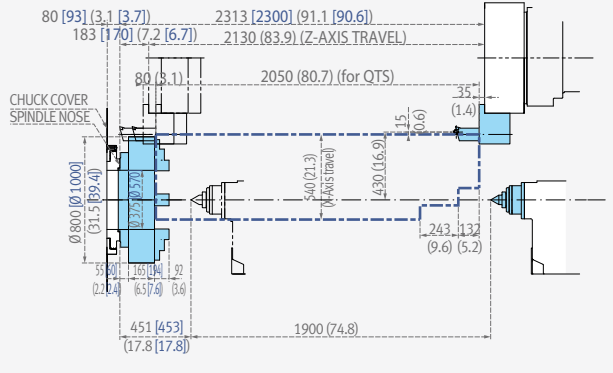
- Options
- Applications
- Capacity Diagram
- Specifications

Customer Support Service

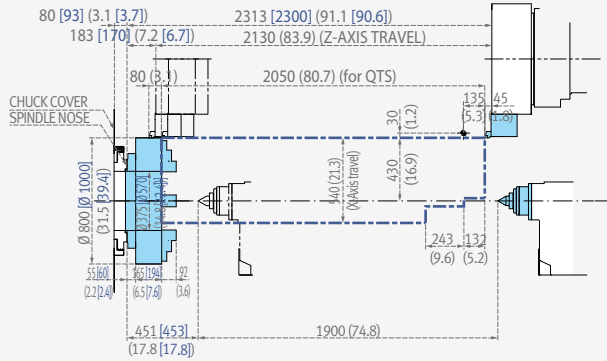
OD Tool Holder



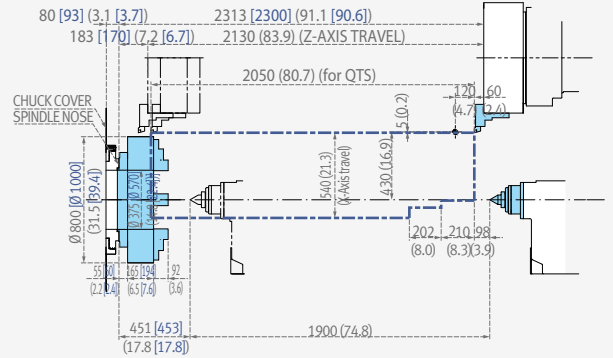
ID Tool Holder



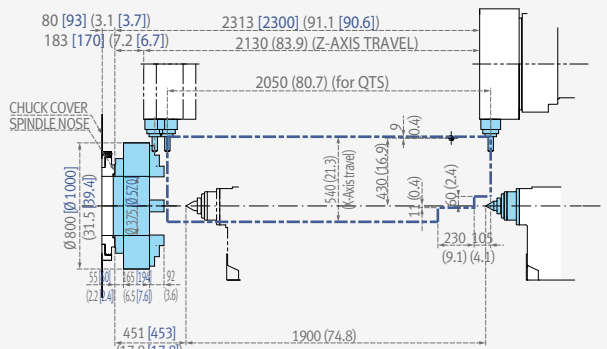
Face Tool Holder



Extende OD Tool Holder



Straight Milling Tool Holder



Machine Specifications



Description		Unit	PUMA 1000A [MA]	PUMA 1000B [MB]	
Capacity	Swing over bed	mm (inch)	1250 (49.2)		
	Swing over saddle	mm (inch)	950 (37.4)		
	Recom. turning diameter	mm (inch)	800 (31.5)		
	Max. turning diameter	mm (inch)	Ø 1000 (39.4)		
	Max. turning length	mm (inch)	2040 (80.3)	2000 (78.7)	
	Chuck size	inch	(ORDER MADE)		
Travels	Travel distance	X-axis	mm (inch)	540 (21.3)	
		Z-axis	mm (inch)	2130 (83.9)	
	Rapid traverse rate	X-axis	m/min (ipm)	12 (472.4)	
		Z-axis	m/min (ipm)	16 (629.9)	
Spindle	Max. spindle speed	r/min	500	300	
	Main spindle motor power (30min./cont.)	kW (Hp)	75 (100.6) / 60 (80.5)		
	Max. spindle torque	N·m (ft·lb)	11011 (8126.1)	12040 (8885.5)	
	Spindle nose	ISO	702-4 No.20	702-4 No.28	
	Spindle bearing dia.(Front)	mm (inch)	440 (17.3)	700 (27.6)	
	Max. Spindle through hole diameter	mm (inch)	Ø375 (14.8)	Ø560 (22.0)	
Turret	No. of tool stations	ea	10 [12: BMT85P]		
	OD tool size	mm (inch)	32 x 32 (1.25 x 1.25)		
	Max. boring bar size	mm (inch)	80 (3.0)		
	Turret indexing time (1 station swivel)	s	0.31		
	Max. rotary tool speed	r/min	[3000]		
	Rotary tool motor power (30min./cont.)	kW (Hp)	[9 (12.1) / 7.5 (10.1)]		
Tailstock	Tailstock travel	mm (inch)	1900 (74.8)		
	Quill diameter	mm (inch)	180(7.1)		
	Quill bore taper	MT	MT#6(Dead)		
	Quill travel	mm (inch)	150(5.9)		
Power Source	Power consumption	kVA	93.4		
Machine Dimensions	Length	mm (inch)	6595 (259.6)		
	Width	mm (inch)	3210 (126.4)		
	Height	mm (inch)	2835 (111.6)		
	Weight	kg (lb)	21000 (46296.4)	23000 (50705.6)	
Control	CNC System		DOOSAN FANUC i {F32i}		

* Bar working diameter is a nominal size(PUMA 1000A : 375mm / PUMA 1000B: 555mm) we can expect when doing the double chucking operation at both sides of the headstock and using spindle through hole.

* {}: Option

CNC Unit Specifications

● Standard ○ Optional X Not applicable

**DOOSAN
FANUC**

Basic Information

Basic Structure

Detailed Information

Options

Applications

Capacity Diagram

Specifications

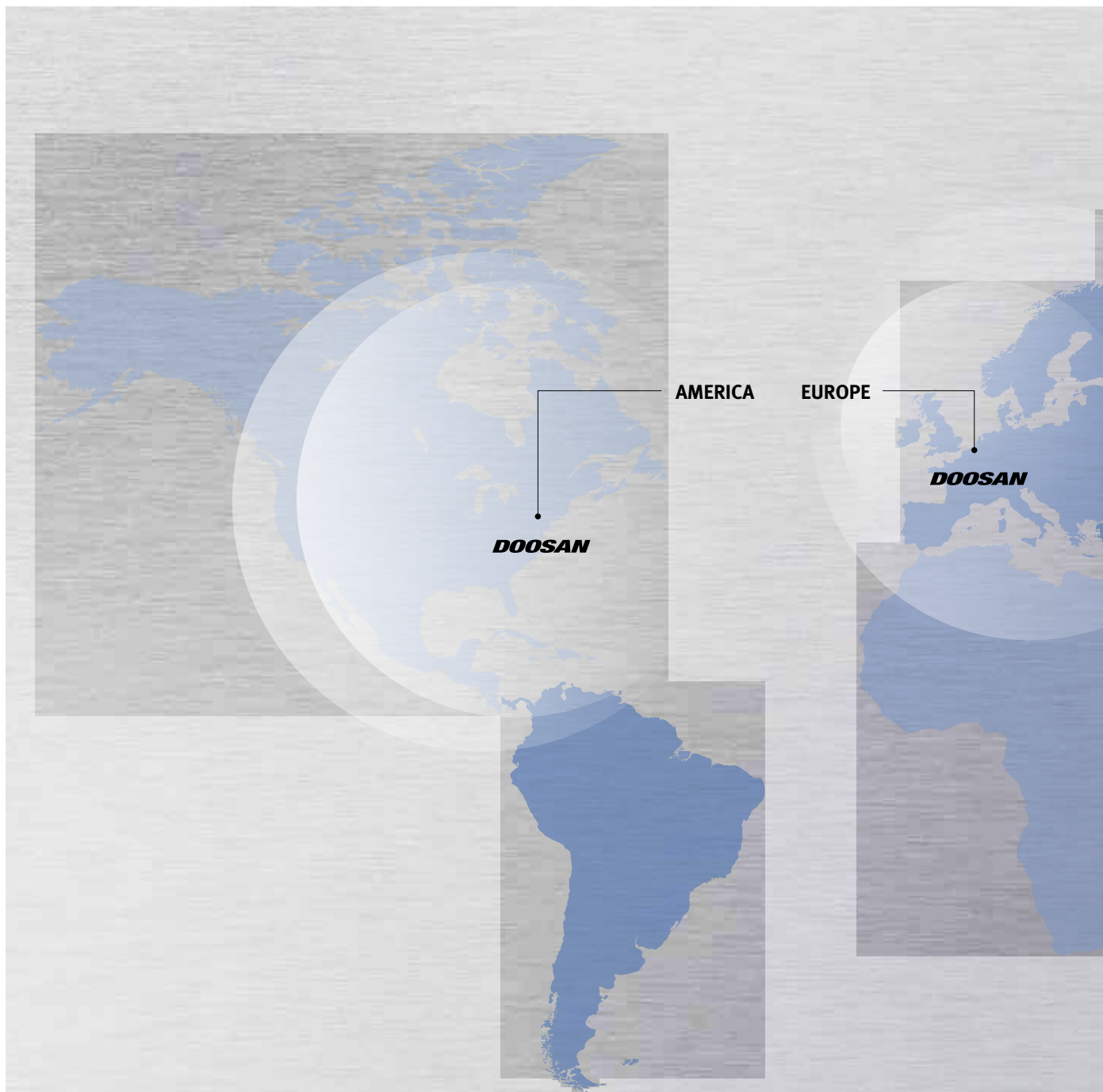
Customer Support Service

No.	Division	Item	Spec.	DOOSAN Fanuc i (F0i-F)		FANUC 32i (F32i-B) option	
				2-Axis	M	2-Axis	M
1	Axes Control	Synchronous/Composite control (C1 & C2 Synchro Control)		X	X	X	X
2		Arbitrary angular axis control		X	X	X	X
3		Increment system	ISA, IS-B	●	●	●	●
4		Interlock		●	●	●	●
5		Machine lock	all / each axis	●	●	●	●
6		Emergency stop		●	●	●	●
7		Over travel		●	●	●	●
8		Mirror image	each axis	●	●	●	●
9		Follow-up		●	●	●	●
10		Servo off/Mechanical handle		●	●	●	●
11	Operation	DNC operation	Included in RS232C interface.	●	●	●	●
12		DNC operation with memory card		●	●	●	●
13		Tool retract and recover		○	○	○	○
14		Manual intervention and return		●	●	○	○
15		Wrong operation prevention		●	●	●	●
16		Dry run		●	●	●	●
17		Single block		●	●	●	●
18		Reference position shift		●	●	●	●
19		Handle interruption		○	○	○	○
20		Incremental feed	x1,x10,x100	●	●	●	●
21	Manual handle retrace		○	○	○	○	
22	Active block cancel		○	○	○	○	
23	Interpolation Functions	Nano interpolation		●	●	●	●
24		Linear interpolation		●	●	●	●
25		Circular interpolation		●	●	●	●
26		Polar coordinate interpolation		X	●	X	●
27		Cylindrical interpolation		X	●	X	●
28		Helical interpolation		X	○	X	○
29		Thread cutting, synchronous cutting		●	●	●	●
30		Multi threading		●	●	●	●
31		Thread cutting retract		●	●	●	●
32		Continuous threading		●	●	●	●
33		Variable lead thread cutting		●	●	●	●
34		Circular thread cutting		○	○	○	○
35		Polygon machining with two spindles		X	●	X	○
36		Multi-step skip		○	○	○	○
37	High-speed skip	Input signal is 8 points.	○	○	○	○	
38	2nd reference position return	G30	●	●	●	●	
39	3rd/4th reference position return		●	●	○	○	
40	Feed Function	Override cancel		●	●	●	●
41		Manual per revolution feed		●	●	●	●
42		AI contour control I		○	○	○	○
43		AI contour control II		○	○	○	○
44		Rapid traverse block overlap		●	●	●	●
45	Program Input	Optional block skip	9 pieces	●	●	●	●
46		Sequence number	N5 digit/N8 digit	N5 digit	N5 digit	N8 digit	N8 digit
47		Absolute/incremental programming	Combined use in the same block	●	●	●	●
48		Decimal point programming / pocket calculator type decimal point programming		●	●	●	●
49		Automatic coordinate system setting		●	●	●	●
50		Workpiece coordinate system	G52 - G59	●	●	●	●
51		Workpiece coordinate system preset		●	●	○	○
52		Addition of workpiece coordinate system	48 pairs	X	X	○	○
53	Direct drawing dimension programming		●	●	●	●	

● Standard ○ Optional ✕ Not applicable

No.	Division	Item	Spec.	DOOSAN Fanuc i (F0i-F)		FANUC 32i (F32i-B) <small>option</small>	
				2-Axis	M	2-Axis	M
54	Program Input	G code system	A	●	●	●	●
55		G code system	B/C	●	●	●	●
56		Chamfering/Corner R		●	●	○	○
57		Custom macro		●	●	●	●
58		Addition of custom macro common variables	#100 - #199, #500 - #999	●	●	○	○
59		Interruption type custom macro		●	●	○	○
60		Canned cycle		●	●	●	●
61		Multiple repetitive cycles	G70-G76	●	●	●	●
62		Multiple repetitive cycles II	Pocket profile	●	●	●	●
63		Canned cycle for drilling		●	●	●	●
64		Automatic corner override		✕	✕	○	○
65		Coordinate system shift		●	●	●	●
66		Direct input of coordinate system shift		●	●	●	●
67	Pattern data input		●	●	○	○	
68	Operation Guidance Function	EZ Guidei (Conversational Programming Solution)		●	●	●	●
69		EZ Operation package		●	●	●	●
70	Auxiliary / Spindle Speed Function	Constant surface speed control		●	●	●	●
71		Spindle override	0 - 150%	●	●	●	●
72		Spindle orientation		●	●	●	●
73		Rigid tap		●	●	●	●
74		Arbitrary speed threading		●	●	●	●
75	Tool Function / Tool Compensation	Tool offset pairs	32-pairs	✕	✕	✕	✕
76		Tool offset pairs	64-pairs	✕	✕	●	●
77		Tool offset pairs	99-pairs	✕	✕	○	○
78		Tool offset pairs	128-pairs	●	●	✕	✕
79		Tool offset pairs	200-pairs	○	○	○	○
80		Tool offset pairs	400-pairs	✕	✕	○	○
81		Tool offset pairs	499-pairs	✕	✕	○	○
82		Tool offset pairs	999-pairs	✕	✕	○	○
83		Tool offset		●	●	●	●
84		Tool radius/Tool nose radius compensation		●	●	●	●
85		Tool geometry/wear compensation		●	●	●	●
86		Automatic tool offset	G36/G37	●	●	●	●
87		Direct input of offset value measured B		●	●	●	●
88	Tool life management		●	●	●	●	
89	Accuracy Compensation Function	Backlash compensation for each rapid traverse and cutting feed		●	●	●	●
90		Stored pitch error compensation		○	○	○	○
91	Editing Operation	Part program storage size & Number of registerable programs	640M(256KB)_500 programs	✕	✕	●	●
92		Part program storage size & Number of registerable programs	1280M(512KB)_1000 programs	✕	✕	○	○
93		Part program storage size & Number of registerable programs	2560M(1MB)_1000 programs	✕	✕	○	○
94		Part program storage size & Number of registerable programs	5120M(2MB)_1000 programs	○	○	○	○
95		Part program storage size & Number of registerable programs	1280M(512KB)_400 programs	●	●	✕	✕
96		Part program storage size & Number of registerable programs	5120M(2MB)_400 programs	○	○	✕	✕
97		Program protect		●	●	●	●
98		Password function		●	●	●	●
99		Playback		●	●	○	○
100	Data Input / Output	Fast data server		○	○	○	○
101		External data input		●	●	○	○
102		Memory card input/output		●	●	●	●
103		USB memory input/output		●	●	●	●
104		Automatic data backup		●	●	●	●
105	Interface Function	Embedded Ethernet		●	●	●	●
106		Fast Ethernet		○	○	○	○
107	Others	Display unit	10.4" color LCD	●	●	●	●
108		Display unit	15" color LCD	○	○	○	○
109		Robot interface with PMCI/O module		○	○	○	○
110		Robot interface with PROFIBUS-DP		○	○	○	○

Responding to Customers Anytime, Anywhere



Global Sales and Service Support Network

Corporations

4

Dealer Networks

164

Technical Centers

51

Service Post

198

Factories

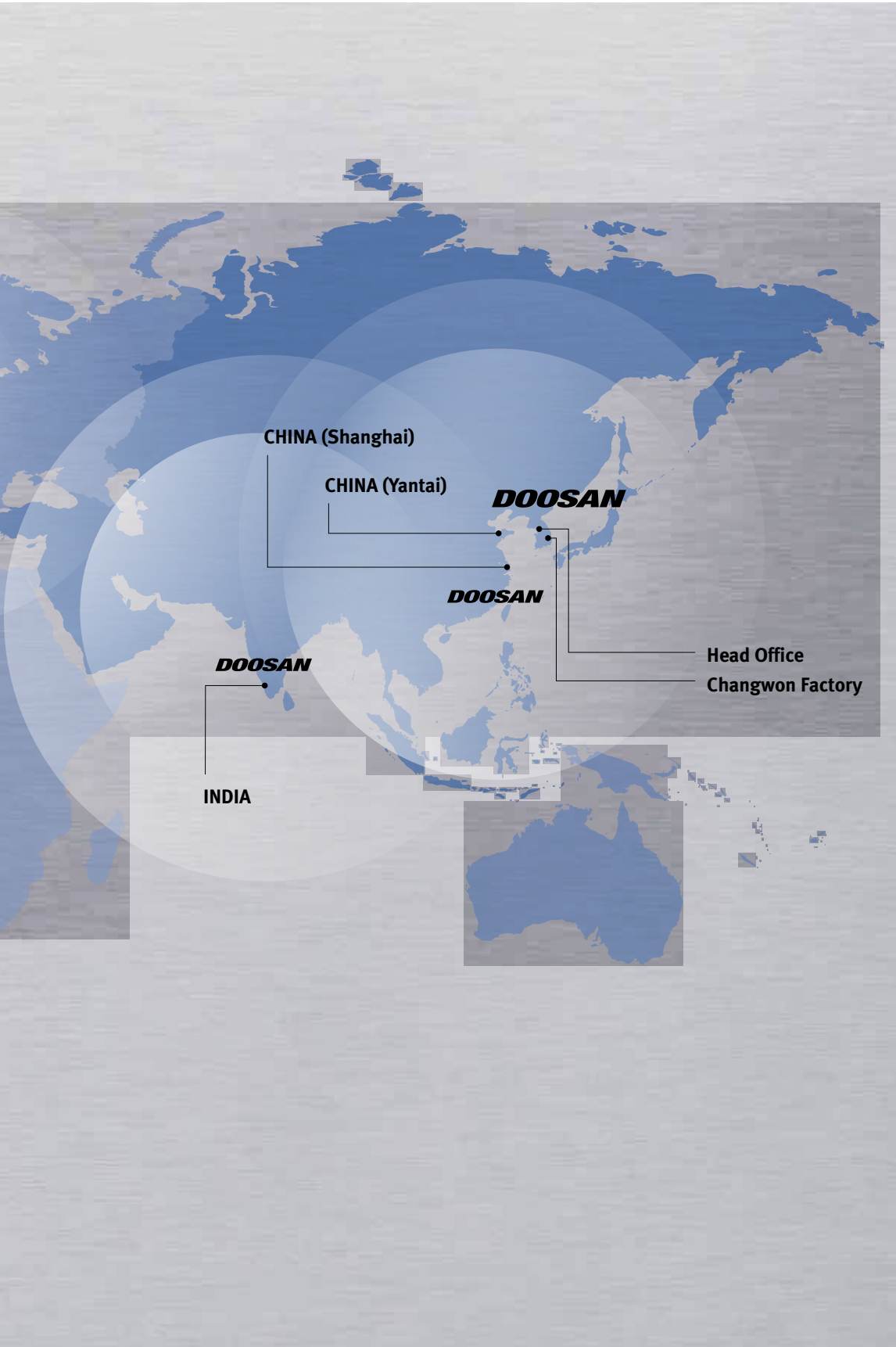
3

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 1000 series



Description		Unit	PUMA 1000A [MA]	PUMA 1000B [MB]
Capacity	Max. turning diameter	mm(inch)	1000 (39.4)	
	Max. turning length	mm(inch)	2040 (80.3)	2000 (78.7)
	Chuck size	inch	(ORDER MADE)	
Travels	Travel distance	X-axis	540 (21.3)	
		Z-axis	2130 (83.9)	
	Rapid traverse	X-axis	12 (472.4)	
		Z-axis	16 (629.9)	
Spindle	Max. spindle speed	r/min	500	300
	Main spindle motor power (30min/Cont.)	kW(hp)	75 (100.6) /60 (80.5)	
	Max. spindle torque	N·m (ft·lb)	11011 (8126.1)	12040 (8885.5)
	Spindle through hole diameter	mm(inch)	∅375 (14.8)	∅560 (22.0)
Turret	No. of tool stations	ea	10 [BMT85P : 12]	
	OD tool size	mm(inch)	32 x 32 (1.25 x 1.25)	
	Max. ID tool size	mm(inch)	∅80 (3.0)	
	Max. rotary tool speed	r/min	3000	

*{}: Option

Doosan Machine Tools

www.doosanmachinetools.com

www.facebook.com/doosanmachinetools

www.youtube.com/c/DoosanMachineToolsCorporation

Head Office

22FT Tower, 30, Sowol-ro 2-gil, Jung-gu,
Seoul, Korea, 04637
Tel +82-2-6972-0370 / 0350
Fax +82-2-6972-0400

Doosan Machine Tools America

19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.
Tel +1-973-618-2500
Fax +1-973-618-2501

Doosan Machine Tools Europe

Emdener Strasse 24, D-41540 Dormagen,
Germany
Tel +49-2133-5067-100
Fax +49-2133-5067-111

Doosan Machine Tools India

No.82, Jakkuar Village, Yelahanka Hobil,
Bangalore-560064

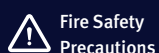
Doosan Machine Tools China

Room 101,201,301, Building 39 Xinzhuan
Highway No.258 Songjiang District, China
Shanghai(201612)
Tel +86 21-5445-1155
Fax +86 21-6405-1472

* For more details, please contact Doosan Machine Tools.

* The specifications and information above-mentioned may be changed without prior notice.

* Doosan Machine Tools Co., Ltd. is a subsidiary of MBK Partners. The trademark **DOOSAN** is used under a licensing agreement with Doosan Corporation, the registered trademark holder.



**Fire Safety
Precautions**

There is a high risk of 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.

ver. EN 190613 SU