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™

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

*PUMA 1000M with optional equipment.

Perfect specification for machining large work pieces.

Machining of large parts and powerful cutting in various industries with max. turning dia. ø1000 mm, machining length 2000 mm and max. spindle torque 12040 N·m.

Offering various sizes of pipe machining solutions

- Max. Ø560 mm (Ø22.0 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

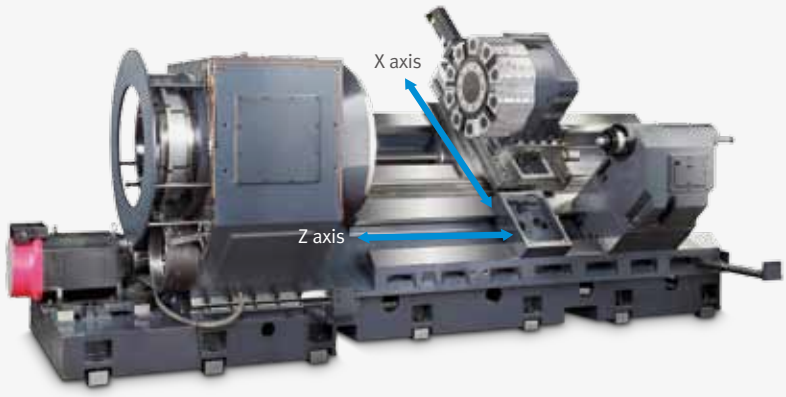
Turret indexing is possible even with a long boring bar(ø100xL1000 mm) mounted on a newly designed high rigidity turret for improved machining stability and productivity.

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 1000series 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

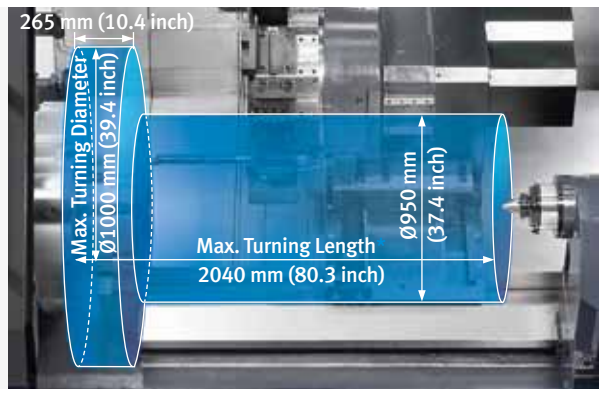
PUMA 1000 series could be applied to big steel rollers, large diameter flanges, long shafts of ships etc, thanks to its big spindle through hole and large swing for big workpiece.

Max. Turning Diameter

ø1000mm
(ø39.4 inch)

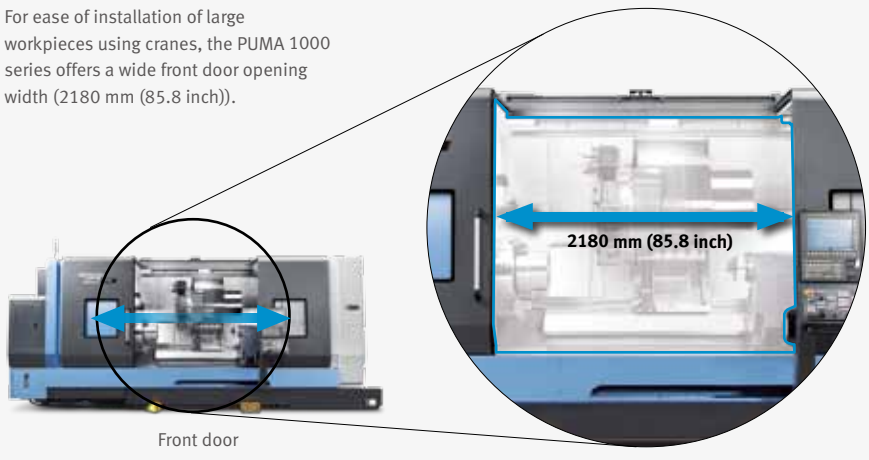
Max. Turning Length*

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. Ø560 mm (Ø22.0 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 though hole (bore)

The PUMA 1000series has a big spindle through hole upto Ø560 (Ø22")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]

ø375 [ø560] mm

(ø14.8 [ø22.0] inch)

Max.Spindle Power (30min/cont.)

75/60 kW

(100.6 / 80.5 Hp)

Max. Spindle Speed

PUMA 1000A/MA [1000B/MB]

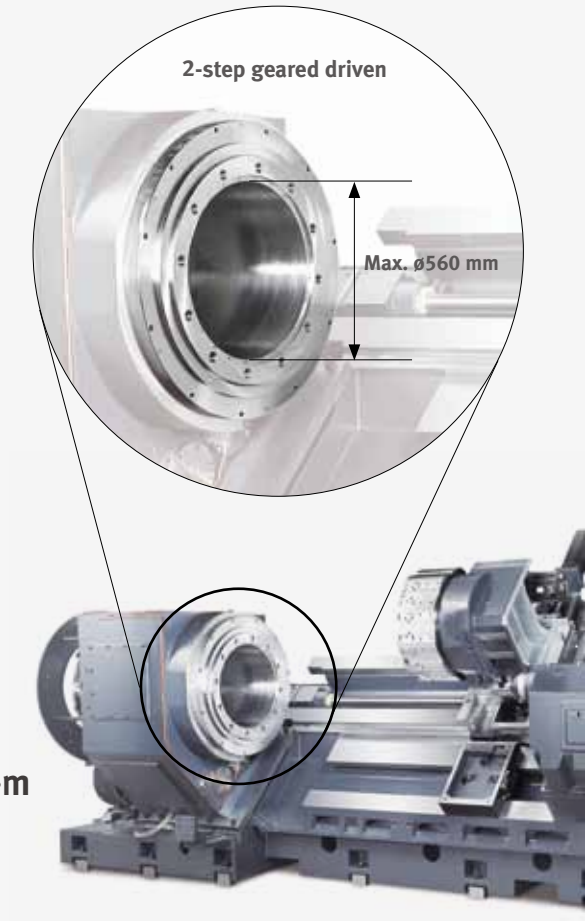
500 [300] r/min

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 / ø180 mm

(5.9 /ø7.1 inch)


Built-in Dead center MT#

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 riven 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 Ø100 x L1000mm (Ø3.94 x 39.4) sized long boring bar in its turret.

No. of Tool Station

PUMA 1000

10 stations
(for turning only)

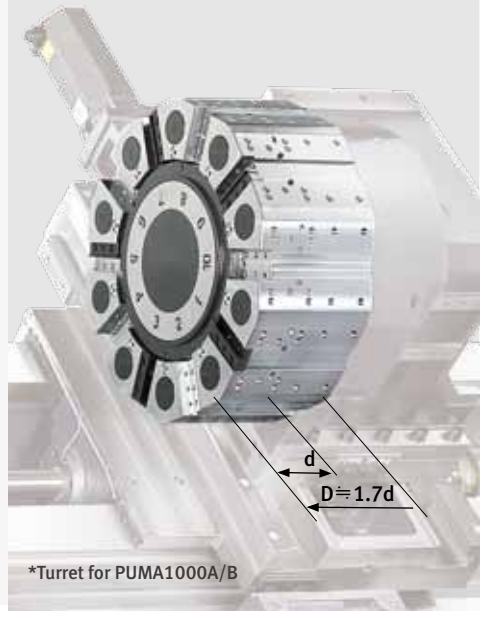
Max. OD Tool Size

32 x 32 mm
(1.25 X 1.25 inch)

Max. Boring Bar Size

ø80 mm
(ø3.1 inch)

"d" is turret thickness of the existing PUMA600/700/800series



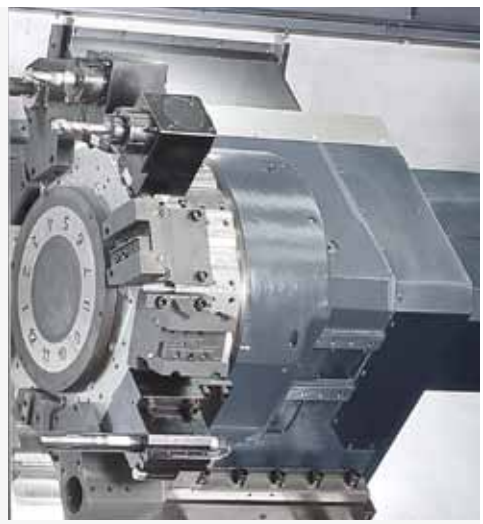
*Turret for PUMA1000A/B

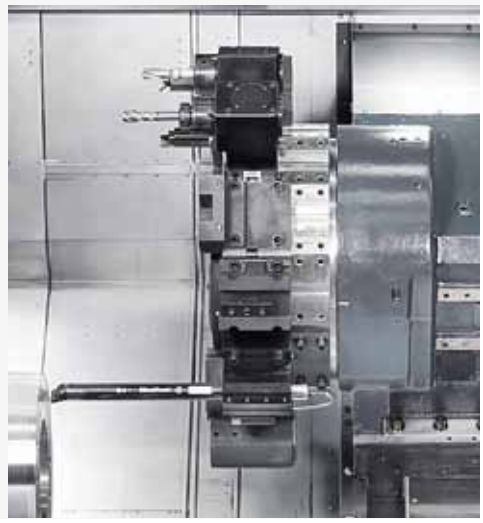
PUMA 1000M

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	Chuck (Left / Right)	None			●	●
4		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			○	○
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		○	○

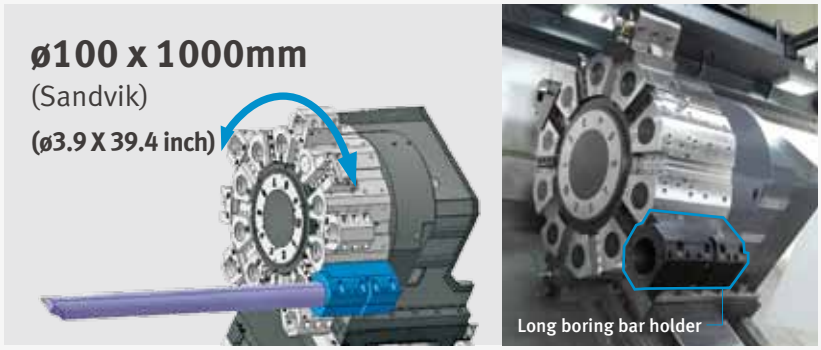
* Please contact DOOSAN to select detailed steady rest specifications

* 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.

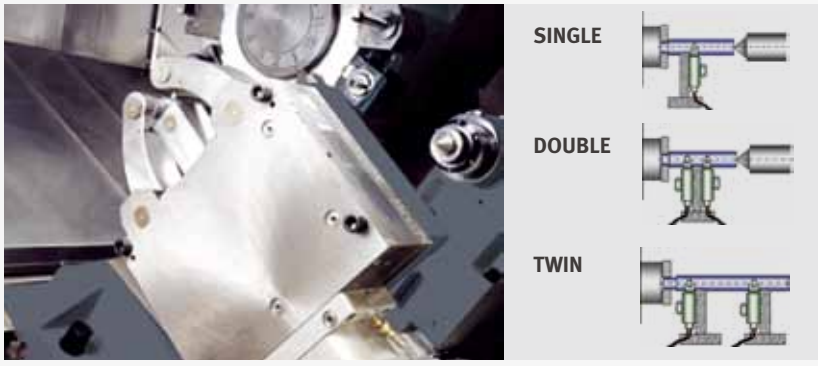


Twin chucking option

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.

Chip conveyor (Right side) option

Long | Short | Needle | Sludge

Chip conveyor type \ Material		Carbon steel			Cast iron		Aluminium		
		Long	Short	Needle	Short	Sludge	Long	Short	Needle
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 tunned ideally to PUMA 1000 series, in order to maximize productivity.

User-friendly operation panel

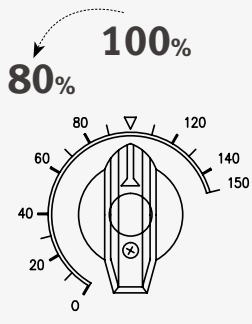
The newly designed operation panel groups all of the common buttons together to enhance operator's convenience. Also, 'QWERTY' keypad is applied as standard to improve convenience of users who are accustomed to PC keyboards.

10.4 " Display

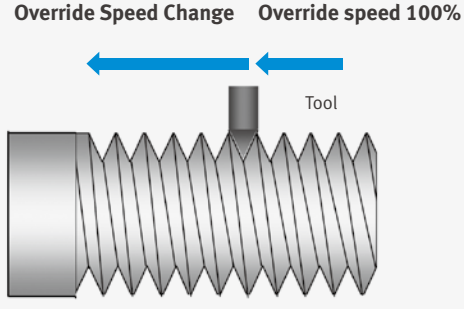
- **USB & PCMCIA card (Std.)**
- **Qwerty type keyboard**
- **Easy to put button switch for attached option**
- **Ergonomic new design**

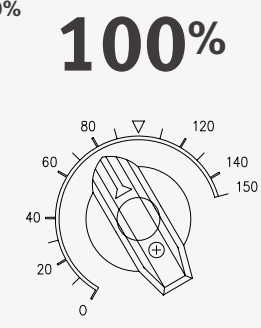
Arbitrary Speed Threading

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



SPINDLE OVERRIDE

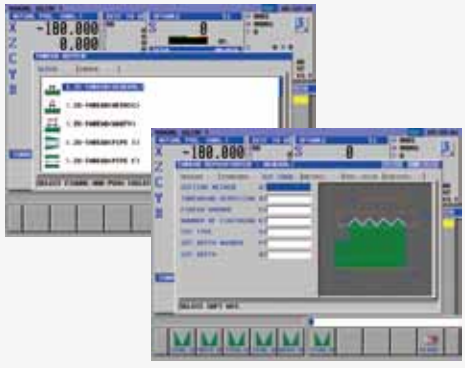




SPINDLE OVERRIDE

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.



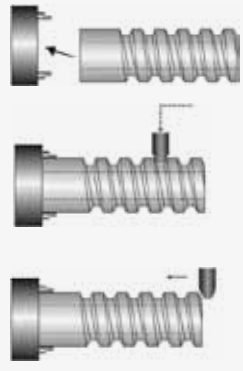
Re-machining function option

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

[1Step]
Chucking the damaged part

[2Step]
Manually positioning the tool into the machined thread with the spindle stopped

[3Step]
Retract the tool and run threading part program



Power-Torque Diagram

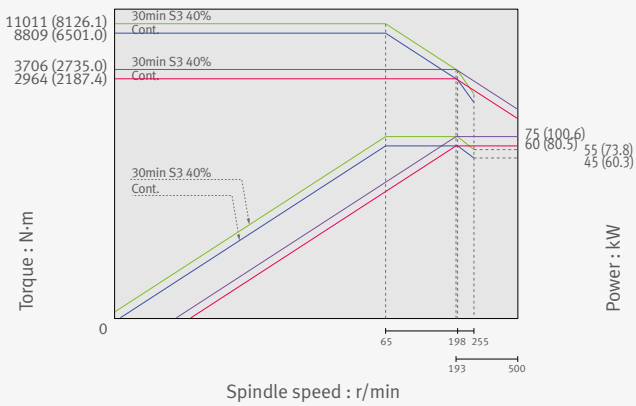
Main spindle

PUMA 1000A/MA

Speed **500** r/min

Power **75/60** kW (100.6 / 80.5 Hp)

Torque **11011** N·m (8126.1 ft-lb)

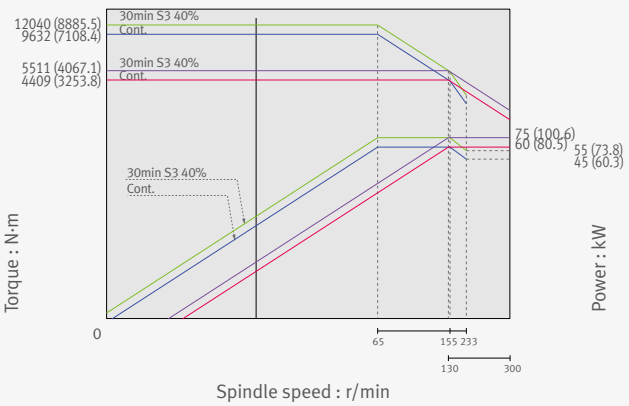


PUMA 1000B/MB

Speed **300** r/min

Powe **75/60** kW (100.6 / 80.5 Hp)

Torque **12040** N·m (8885.5 ft-lb)



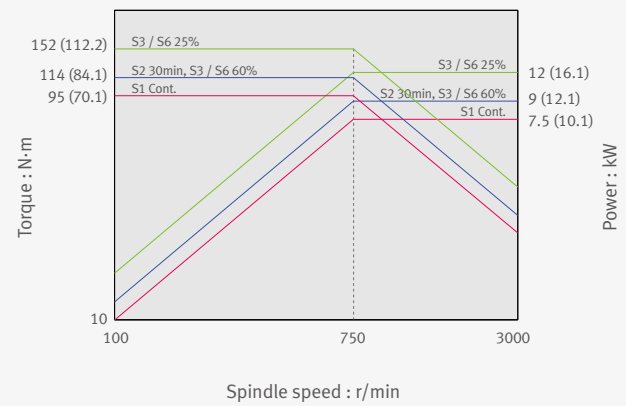
Rotary tool

PUMA 1000M

Speed **3000** r/min

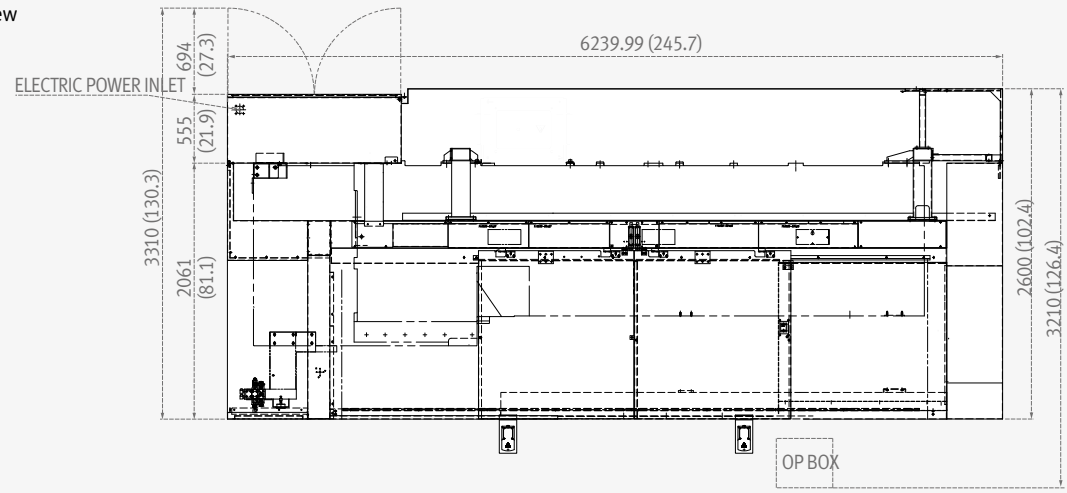
Powe **12** kW (16.1 Hp)

Torque **152** N·m (112.2 ft-lb)

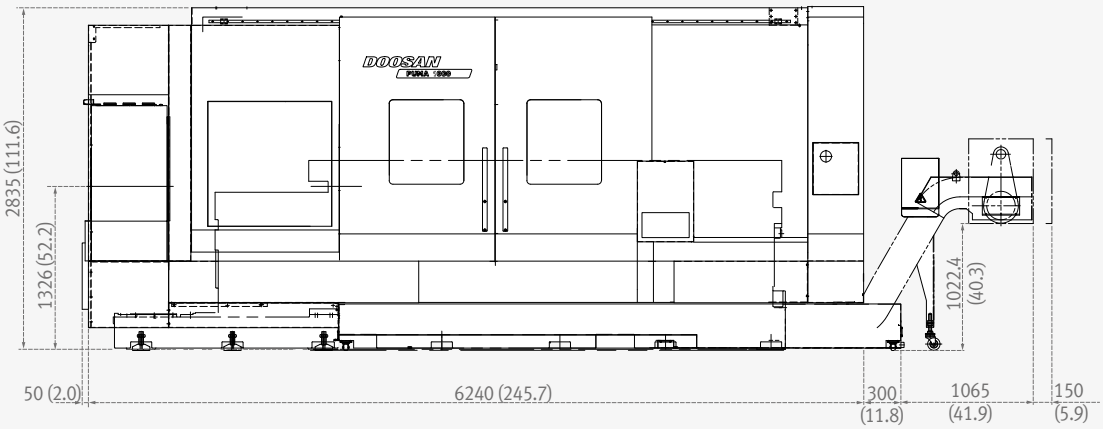


External Dimensions

Top view



Front view

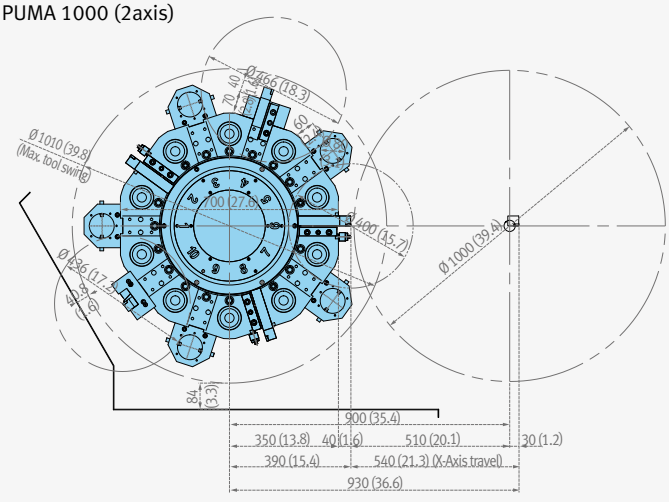


* Some peripheral equipment can be placed in other places

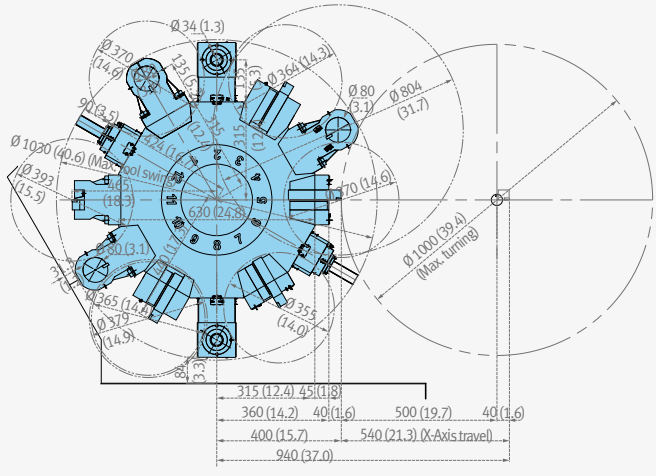
Tool Interference Diagram

Unit : mm (inch)

PUMA 1000 (2axis)



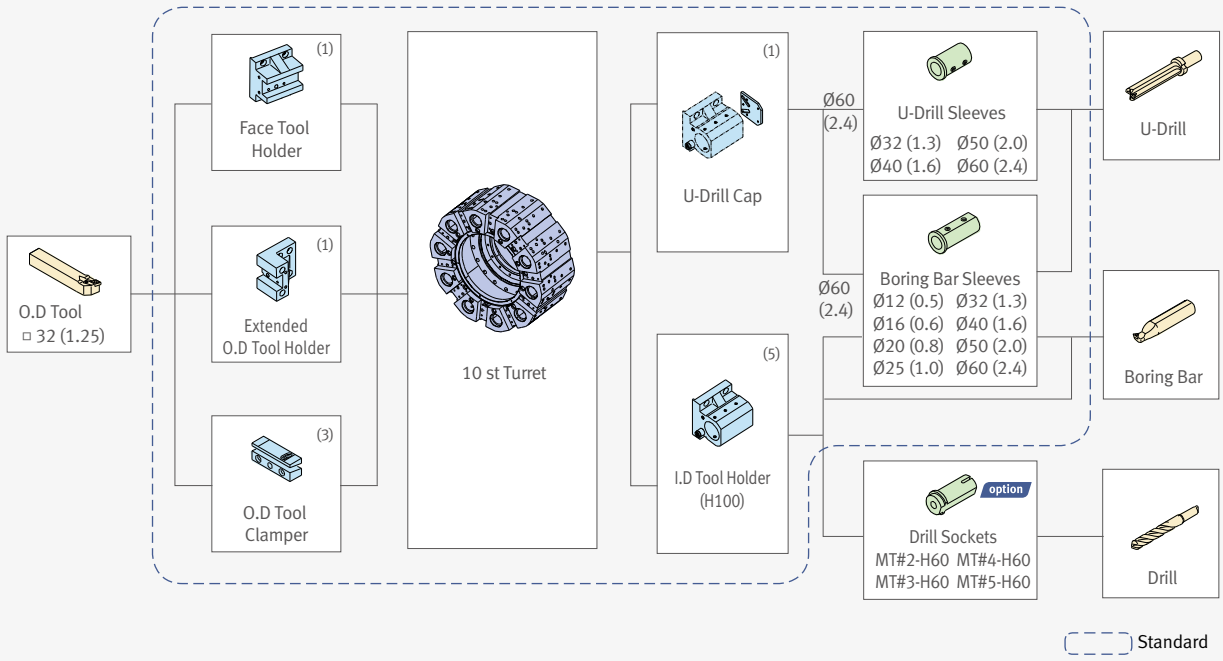
PUMA 1000M (3axis)



Tooling System

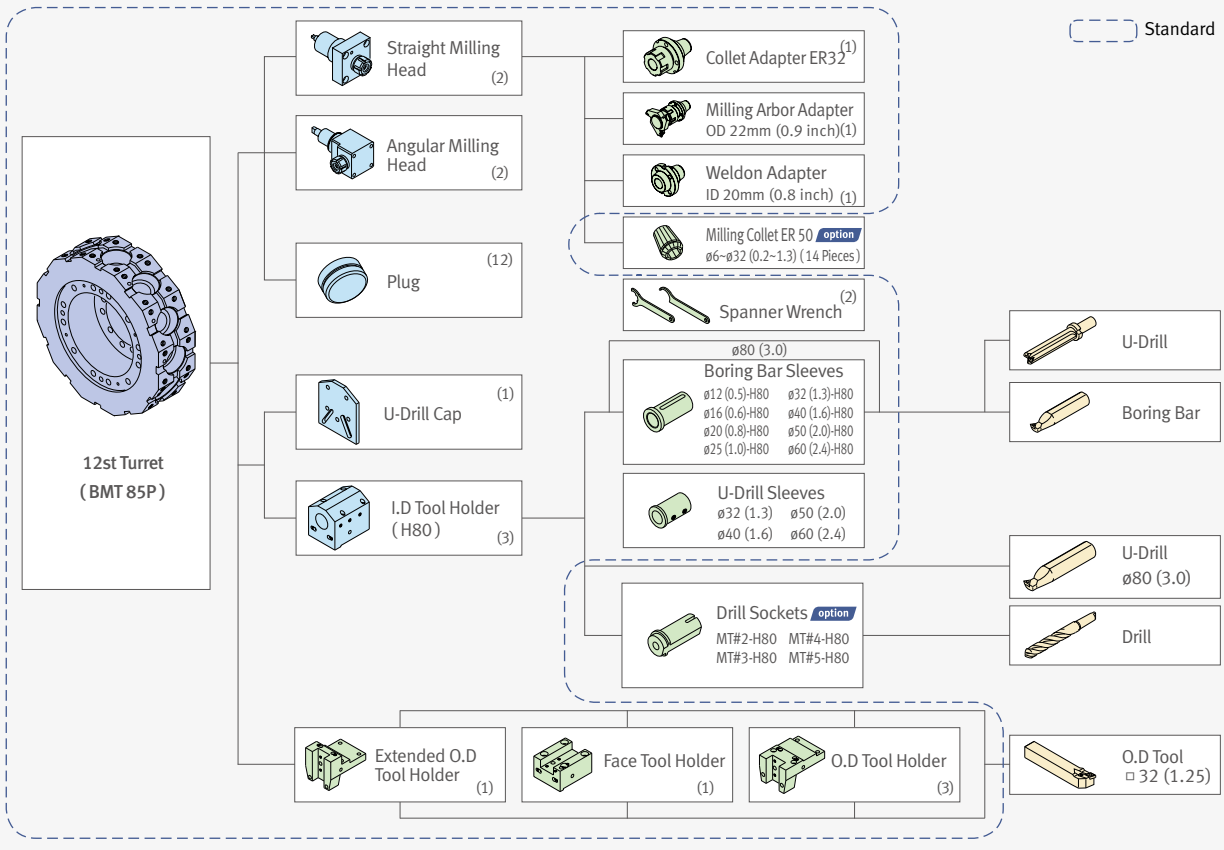
PUMA 1000

Unit : mm (inch)



PUMA 1000M

Unit : mm (inch)

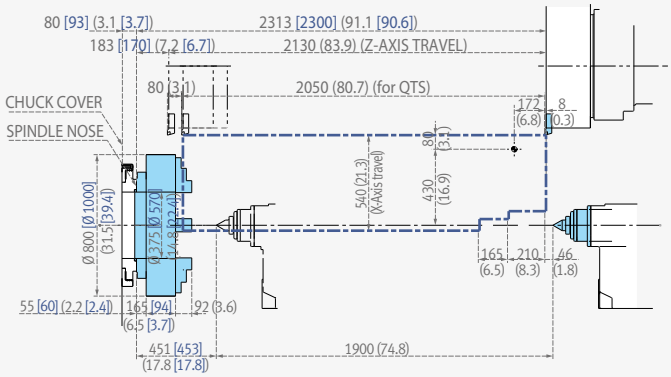


Working Range Diagram

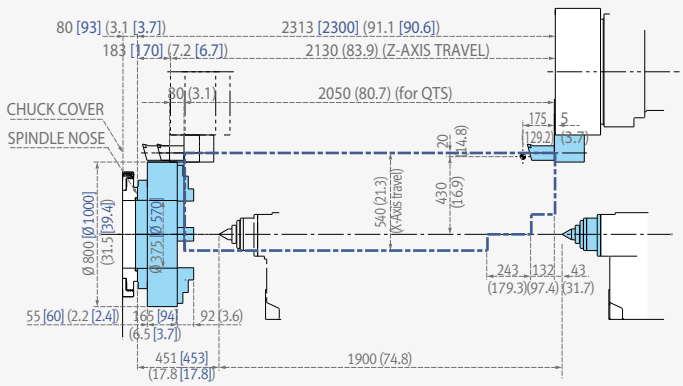
PUMA 1000A / B

Unit : mm (inch)

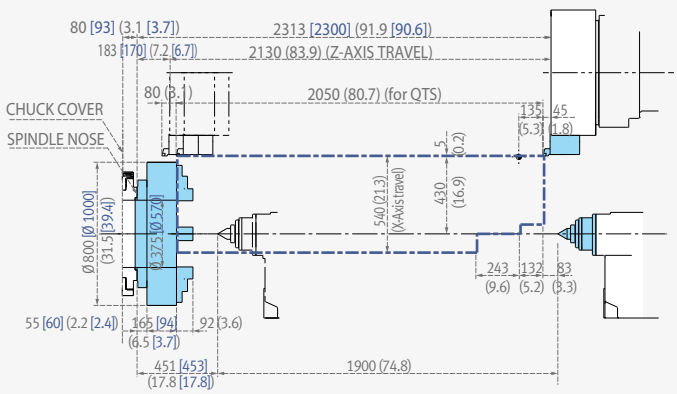
OD Tool Holder



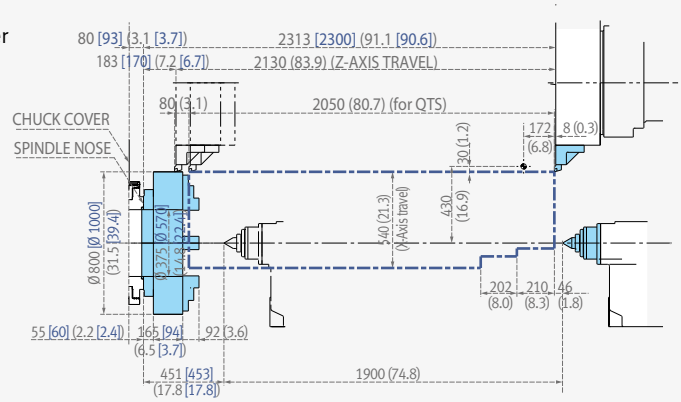
ID Tool Holder



Face Tool Holder



Extende OD Tool Holder

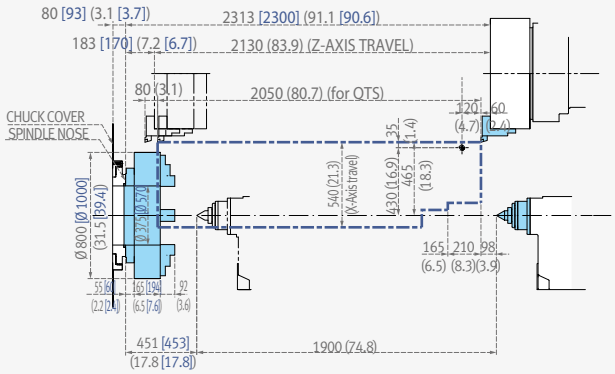


Working Range Diagram

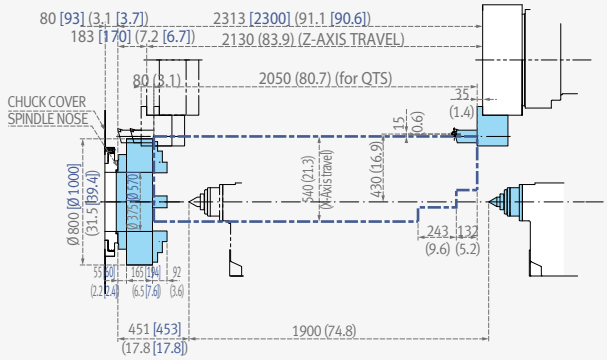
PUMA 1000MA / MB

Unit : mm (inch)

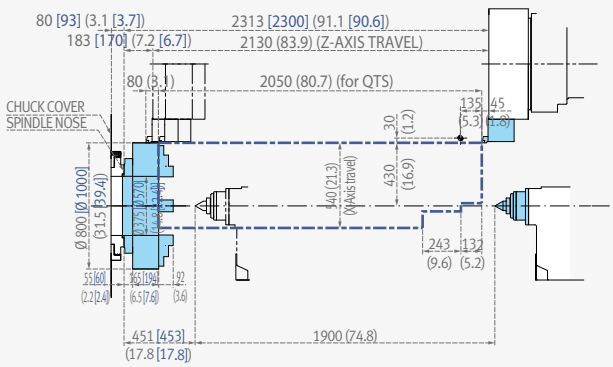
OD Tool Holder



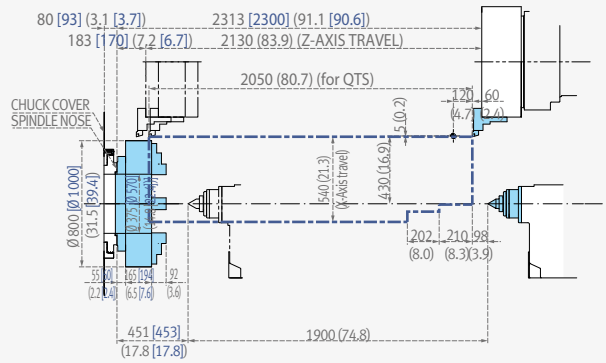
ID Tool Holder



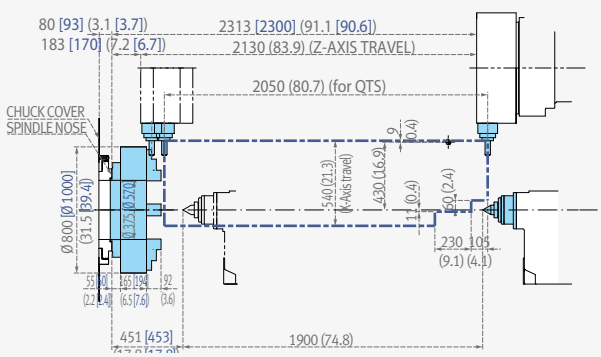
Face Tool Holder



Extende OD Tool Holder



Straight Milling Tool Holder



Machine Specifications

PUMA
1000 series

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

DOOSAN FANUC

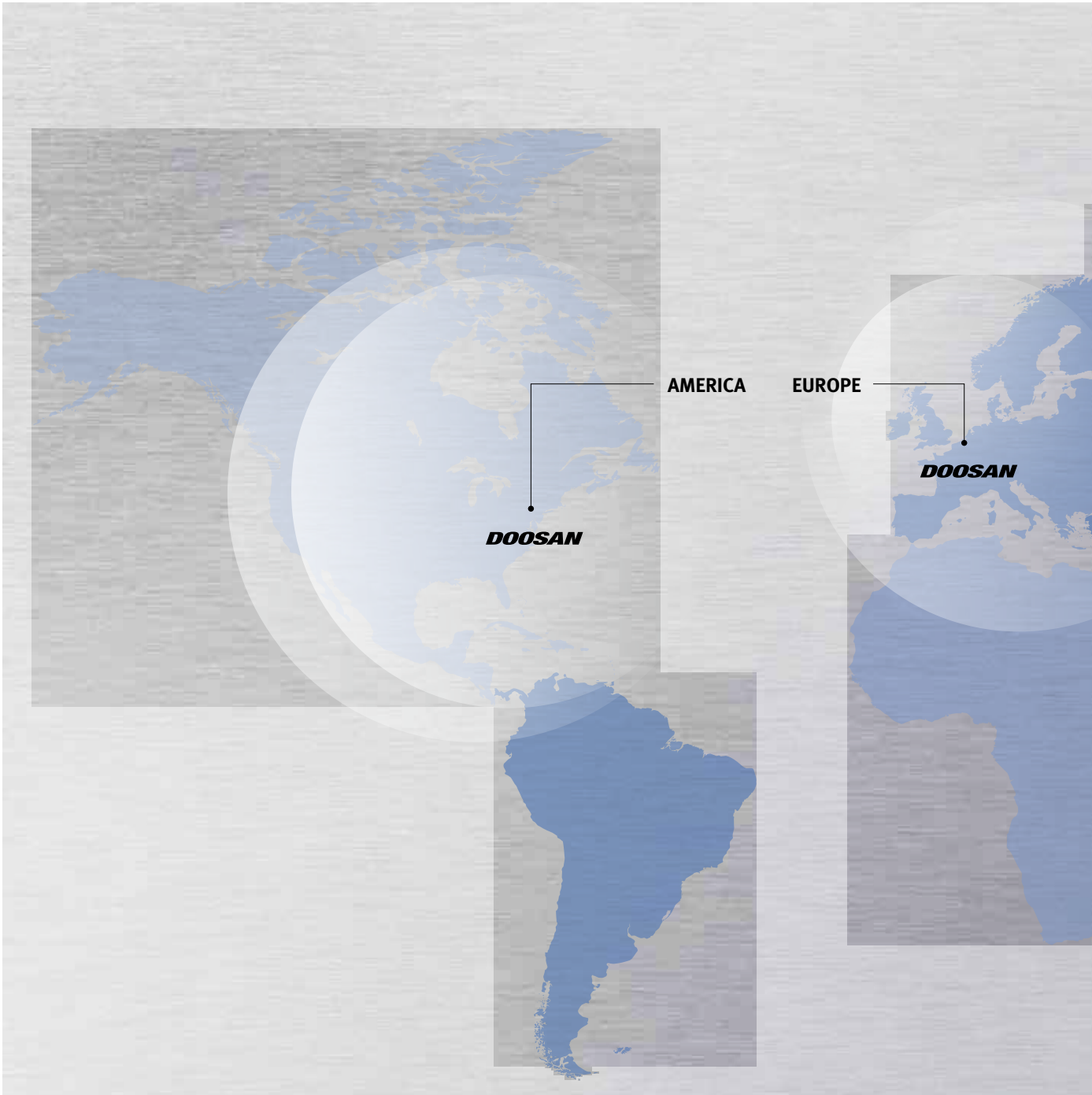
● Standard ○ Optional X Not applicable

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 X Not applicable

No.	Division	Item	Spec.	DOOSAN Fanuc i (F0i-F)		FANUC 32i (F32i-B) option	
				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		X	X	○	○
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	X	X	X	X
76		Tool offset pairs	64-pairs	X	X	●	●
77		Tool offset pairs	99-pairs	X	X	○	○
78		Tool offset pairs	128-pairs	●	●	X	X
79		Tool offset pairs	200-pairs	○	○	○	○
80		Tool offset pairs	400-pairs	X	X	○	○
81		Tool offset pairs	499-pairs	X	X	○	○
82		Tool offset pairs	999-pairs	X	X	○	○
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	X	X	●	●
92		Part program storage size & Number of registerable programs	1280M(512KB)_1000 programs	X	X	○	○
93		Part program storage size & Number of registerable programs	2560M(1MB)_1000 programs	X	X	○	○
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	●	●	X	X
96		Part program storage size & Number of registerable programs	5120M(2MB)_400 programs	○	○	X	X
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 PMC I/O module		○	○	○	○
110		Robot interface with PROFIBUS-DP		○	○	○	○

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 1000 series

Description			Unit	PUMA 1000A [MA]	PUMA 1000B [MB]
Capacity	Max. turning length		mm(inch)	1000 (39.4)	
	Max. turning diameter		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	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 through hole diameter		mm(inch)	Ø375 (14.8)	Ø560 (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)	Ø80 (3.0)	
	Max. rotary tool speed		r/min	3000	

*{} : Option

Doosan Machine Tools

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* 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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