DOOSAN

Optimal Solutions for the Future

PUMA TW2600 series

High Productivity, 10-in. Class, 2-Spindle Horizontal Turning Center

PUMA TW2600
PUMA TW2600-GL

ver. EN 160502 SU

PUMA TW2600 series

The 10-in. class PUMA TW2600 Series turning center is a next-generation standard, 2-spindle automation machine tool providing the users with even higher level of satisfaction with excellent productivity and accuracy.

Contents

Superior Productivity

Implemented with the Feed System Optimization Technology, the PUMA TW2600 Series offer the highest productivity of the class, including high performance feed motor, rapid traverse and acceleration/ deceleration control by section.

Superior Machining Performance

With 15kW power and 404 N-m of high torque, the PUMA TW2600 Series provides the biggest turning diameter (Ø360mm) and the longest turning length (170mm) of the class.

Improved User Convenience

EOP, hot keys and various convenience functions are provided for operating functions and peripheral devices. Work counting, gantry operation and parts control functions further improve the user convenience, especially, in mass production.

Basic structure

A 10-in. class, high productivity, 2-spindle horizontal turning center, the PUMA TW2600 Series offers a built-in gantry model in addition to the standard version.

Standard model
PUMA TW2600

Built-in gantry model
PUMA TW2600-GL

Chuck size
10inch **8inch** option

Travel distance (X x Y axis)
190 x 180 mm
(7.5 x 7.1 inch)

Rapid traverse (X / Y axis)
24 / 24 m/min
(944.9 / 944.9 ipm)

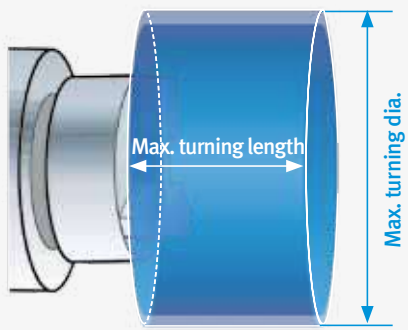
Machining Area

The Series offers the largest machining area of the same class, up to Ø360 mm (Ø14.2 inch) and 170mm (6.7 inch) of max. turning diameter and max. turning length, respectively.

PUMA TW2600 Max. machining area

Max. turning diameter
ø360 mm
(ø14.2 inch)

Max. turning length
170 mm
(6.7 inch)



PUMA TW2600-GL Max. machining area

Max. work diameter (Max. / Min.)
ø200 / ø50 mm
(ø7.9 / ø2.0 inch)

Max. work length (Max. / Min.)
95 / 165 mm
(3.7 / 6.5 inch)

Max. work weight
6 kg (13.2 lb)

Spindle

In addition to the standard spindle which offers the highest power of the class, an even higher torque spindle is available as an option for heavy duty cutting.

Max. spindle speed

3500 r/min

Max. spindle motor power (S3 25%/Cont.)

18.5/15 kW

(24.8 / 20.1 Hp)

Max. spindle motor torque

202 N·m

(149.1 lbf-ft)

404 N·m option

(298.2 lbf-ft)

Turret

The servo-driven turret minimizes idle time (tool change time) with higher reliability.

No. of tool posts

10 ea + 10 ea

Tool 1 ➡ Tool 2

0.73 s

(12% faster than the preceding models)

Tool 1 ➡ Tool 6

1.22 s

(40% faster than the preceding models)

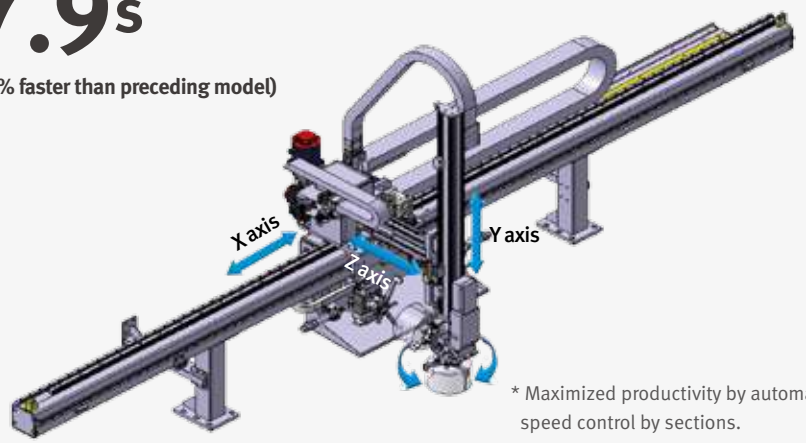
High Speed Gantry Loader

The 3-axis, servo-driven, high-speed gantry loader of the PUMA TW2600-GL model offers minimized work loading/unloading time and maximized productivity.

Gantry loader handling time (Enter → Change Work → Exit)

7.9s

(34% faster than preceding model)



* Maximized productivity by automatic speed control by sections.

Rapid traverse (X x Y x Z axis)

150 x 130 x 50m/min

(5905.5 x 5118.1 x 1968.5 ipm)

Travel distance (A1 / A2 / A3)

X axis 2260 / 2260 / 4120mm

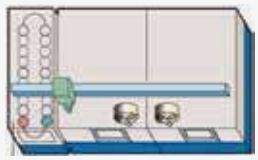
(89.0 / 89.0 / 162.2 inch)

Y axis 710mm (28.0 inch) **Z axis 290mm (11.4 inch)**

Gantry types

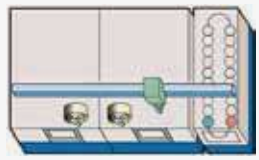
● Loading position
● Unloading position

A-1 type



Work in/out and stocker are at the left side of the gantry

A-2 type



Work in/out and stocker are at the right side of the gantry

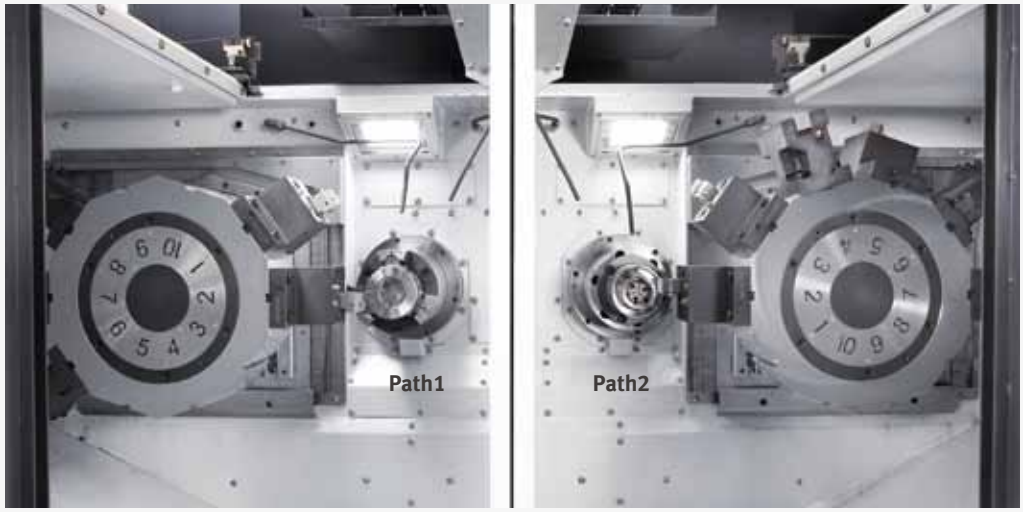
A-3 type

Work in/out position is independent, and stockers are at both the left and right sides of the gantry

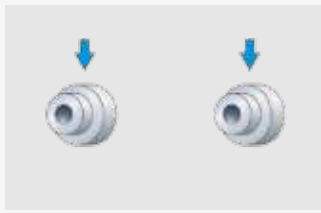
Additional functions for higher productivity and user convenience

- **AUTO RAPID function** (automatic acceleration/deceleration by position)
- **TRACK BACK function** (retraction by a predetermined distance by load sensing)
  The function to protect the loader from collision by detecting load and retracting the loader if collision is expected.
- **Easy flow change function** (work flow direction can be changed with M-code)
  Built-in standard program enables changing gantry loader operation using M-code, such as: L ⋯› R / R ⋯› L / L=R

Applications

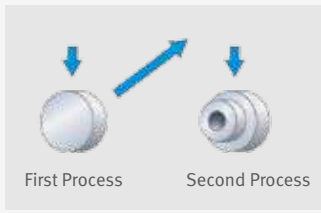


Work concept example 1



Simultaneous machining of same parts at left/right sides

Work concept example 2



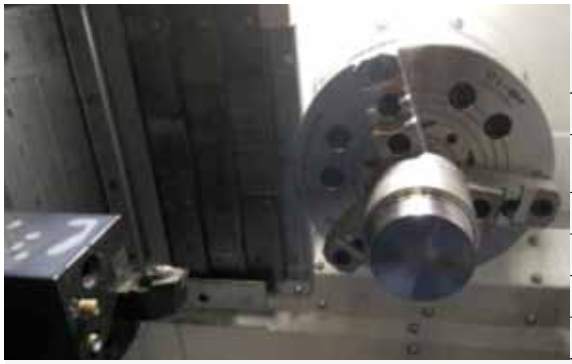
Simultaneous machining of two sequential processes of a same part

Work concept example 3

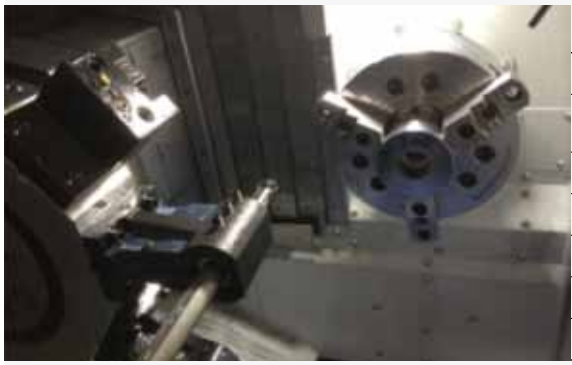
Simultaneous machining of different works

Cutting Performance

The PUMA TW2600 Series offers the greatest cutting performance of the class with max. torque of 404 N·m.



Outer diameter turning (Material: SM45C)		
	Unit	PUMA TW2600 (202 N·m (149.1 ft-lbs))
Cutting speed	m/min (ipm)	210 (8267.7)
Feed	mm/rev (ipr)	0.55 (0.0)
Spindle speed	r/min	875
Cutting depth	mm (inch)	4.6 (0.2)



Inner diameter turning (Roughing/Finishing) (Material: SM45C)		
	Unit	PUMA TW2600 (202 N·m (149.1 ft-lbs))
Cutting speed	m/min (ipm)	280 / 200 (11023.6 / 7874.0)
Feed	mm/rev (ipr)	0.3 / 0.1 (0.0 / 0.0)
Spindle speed	r/min	1393 / 1481
Cutting depth	mm (inch)	3 / 0.4 (0.1 / 0.0)
Tool length	-	4.0D / 3.0D

* 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.

Standard / Optional Specifications

Various optional features are available for customer-specific work environments.

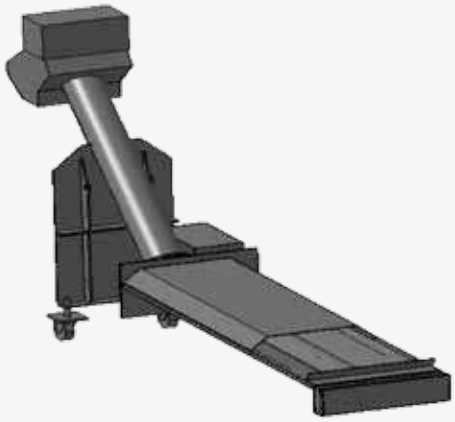
● Standard ○ Optional X N/A

No.	Description	Features	PUMA TW2600	PUMA TW2600-GL
1	Chuck	8 inch	○	○
2		10 inch	●	●
3		Chuck excluded	○	○
4	Turret	10 station	●	●
5	Coolant Pump	1.5 bar	●	●
6		4.5 bar	○	○
7		7 bar	○	○
8	Coolant System Options	Oil Skimmer (Belt-type)	○	○
9		Flushing Coolant	○	○
10		Through-spindle Coolant	○	○
11		Coolant Pressure Switch	○	○
12		High Pressure Coolant Interface	○	○
13	Chucking Option	Chuck Clamp Confirmation	○	○
14	Rear Chip Conveyor	Hinged Belt Type	○	○
15		Magnetic Scrapper Type (for castings)	○	○
16		Screw Type	○	○
17	Chip Bucket	Folklift 300L	○	○
18		Rotation 300L	○	○
19	Chip Disposal Options	Air Blower	○	○
20		Chuck Coolant	○	○
21		Air Gun	○	○
22		Coolant Gun	○	○
23		Mist Collector_Ready	○	○
24		Mist Collector Soluble	○	○
25	Measurement & Automation	Tool Setter (Removable)	○	○
26		Work Position Confirmation Device_Ready	○	○
27		Work Position Confirmation Device_TACO	○	○
28		Auto Door	○	○
29		Work & Tool Counter	○	○
30	Gantry Loader	A1 Type Loader & Stocker	-	○
31		A2 Type Loader & Stocker	-	○
32		A3 Type Loader & Stocker	-	○
33		Turnover Unit	-	○
34		Gripper Type	-	○
35		Work Inspection Chute	-	○
36	Optional Accessories	Tool Load Monitoring System	○	○
37		Linear Scale (X/Z-axis)	○	○
38		Air Conditioner	○	○
39		Signal Tower	○	○
40		Electric Cabinet Lamp	○	○
41		Auto Power Cut-off	○	○

* Please contact DOOSAN to select detail specifications.

Peripheral equipments

Chip conveyor option



Classification	Material	Description
Hinged Belt	Steel	Most typical type of chip conveyors. Suitable for steel material works producing 30 mm or longer chips.
Screw (Auger)	Casting	Chip conveyor with smallest footprint. Demands 80% of footprint compared to hinged belt type.
Magnetic Scrapper	Casting	Chip conveyor with magnets. Suitable for cast steel producing fine chips.

Chip bucket option

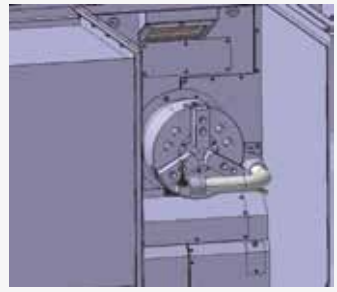
Capacity

300L

(79.3gallon)

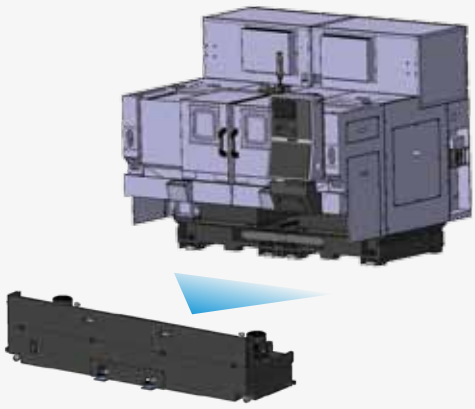
Tool setter option

The tool setter facilitates tool setting, and fast and precise length compensation of abraded tools.



Coolant tank

The coolant tank can be isolated without removing the chip conveyor, significantly enhancing operator convenience.



Independent gantry operation panel

Standard, independent gantry loader operation panel is provided for user convenience.

*PUMA TW2600-GL

Special response to the demands for special turning diameter works option

SWIVEL_1

SWIVEL_2

* Delivery terms will be advised on request

Work counter option

Available counting categories are Total, Daily, and Work. This function further enhances productivity with planned work management.

CNC

CNC systems optimized for DOOSAN's machine tools maximize productivity.

User-friendly operation panel

The operation panel of new design enhances operating convenience with common buttons and layout, and uses Qwerty type keyboard for easy and fast operation.

10.4" display

- **USB & OCMCIA card (standard)**
- **QWERTY keyboard**
- **Buttons can be easily added for additional options**
- **Operation panel newly designed for greater user convenience**

Additional convenience functions

Warming-up (short-cut key)
Warming-up program can be loaded and executed with a short-cut key

Automatic Machine Sleep Function
Enters sleep mode automatically by detecting work on the IN/OUT stockers

Easy operation package

Loader teaching

Helps feed shaft position setting and accuracy control of the loader.

Alarm guidance

Helps the operator to identify the cause of and reset various alarms.

Real-time-based monitoring of loader sensor status

Monitors loader sensors in real-time-basis and provides information on the error causes, enhancing operating efficiency and maintainability.

Tool load monitoring

Max. allowable tool load can be set up for control and actual loading can be plotted according to time into graphs.

Tool counter

Helps managing tool information.
[Tool information includes tool No., tool conditions (general, large diameter, worn/damaged, first-time-used tool, manual), and tool name etc.]

Spindle Power – Torque Diagram

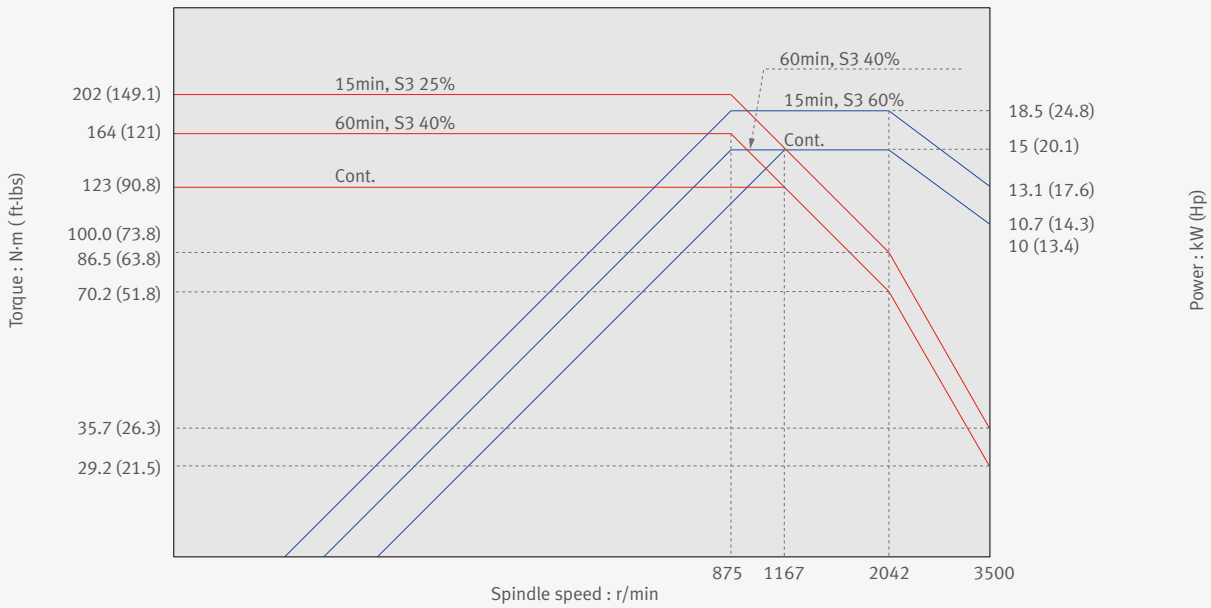
PUMA TW2600 series

PUMA TW2600 / GL

Max. spindle speed
3500 r/min

Max. spindle motor power
18.5/15 kW
(24.8 / 20.1 Hp)

Max. spindle motor torque
202 N·m
(149.1 ft-lbs)

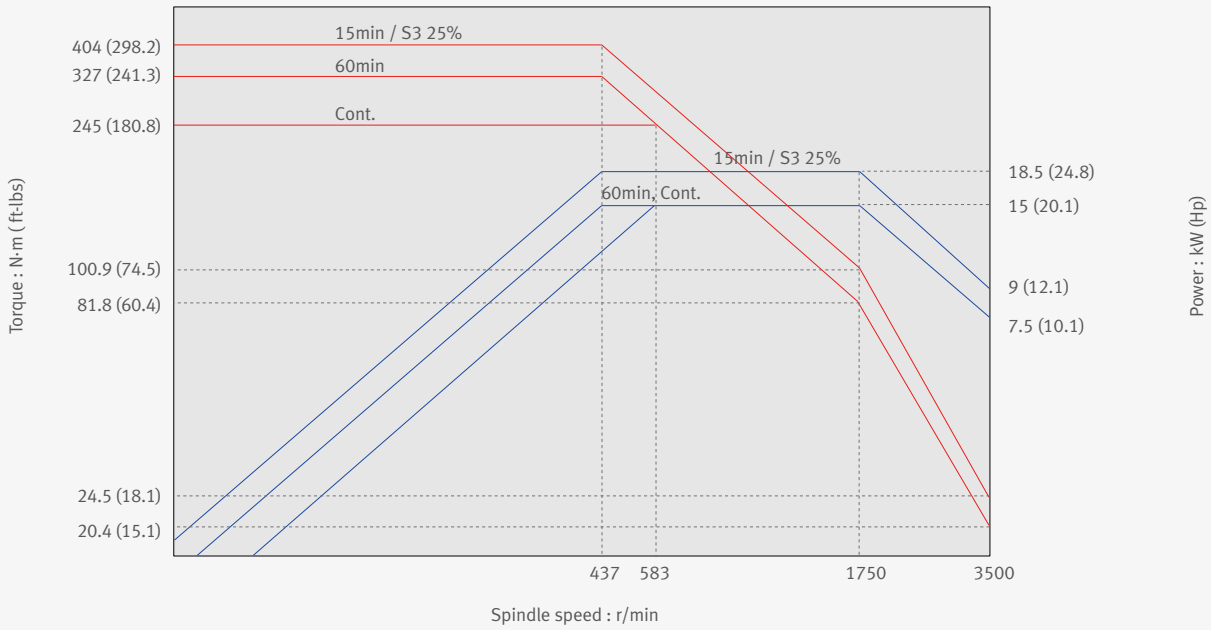


PUMA TW2600 / GL (High Torque) option

Max. spindle speed
3500 r/min

Max. spindle motor power
18.5/15 kW
(24.8 / 20.1 Hp)

Max. spindle motor torque
404 N·m
(298.2 ft-lbs)

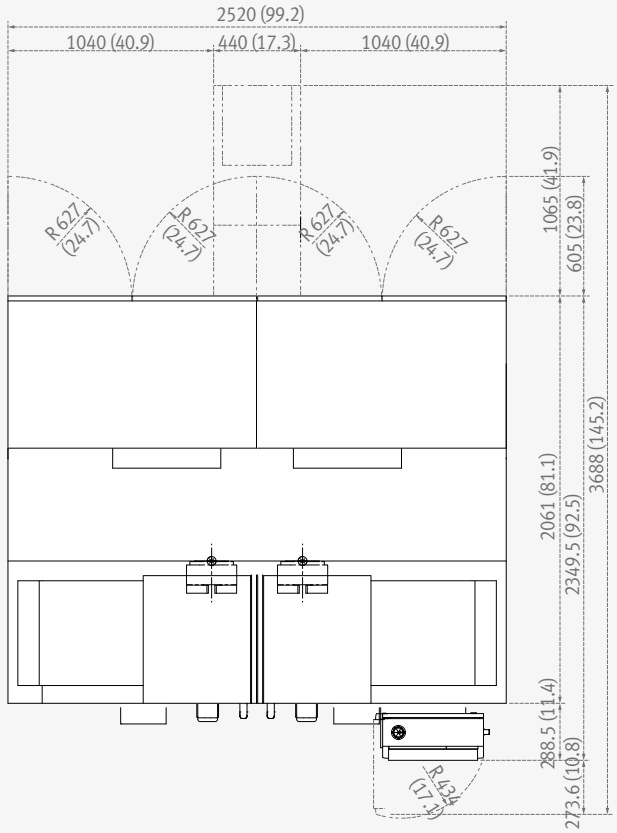


External Dimensions

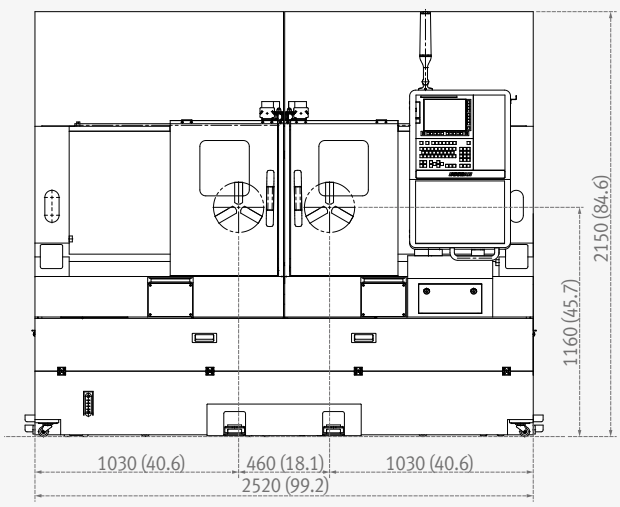
PUMA TW2600

Unit: mm (inch)

Top View



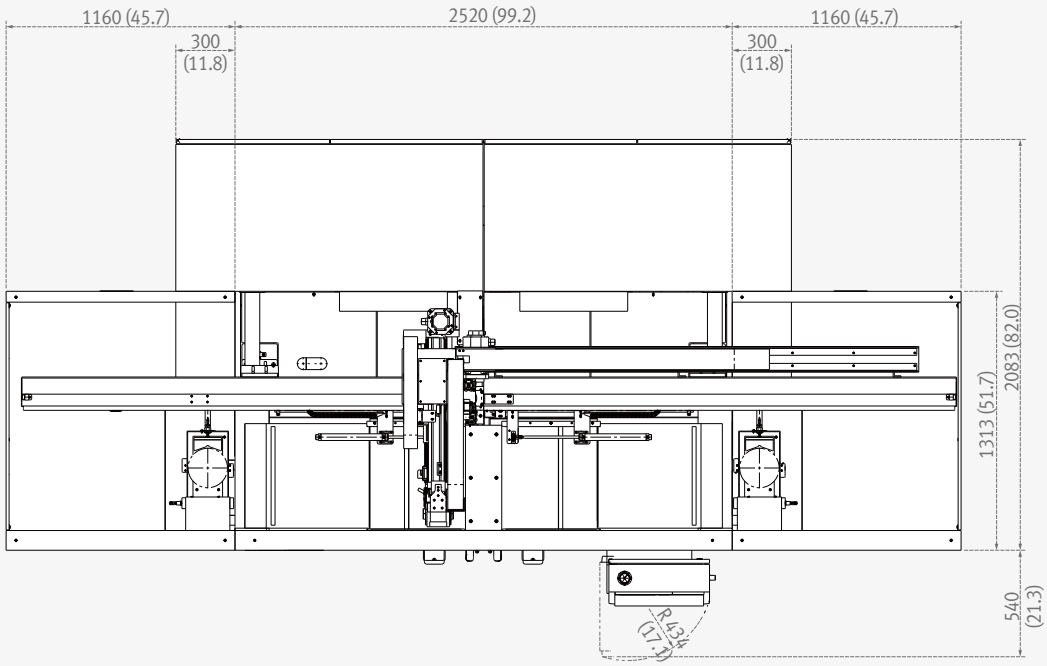
Front View



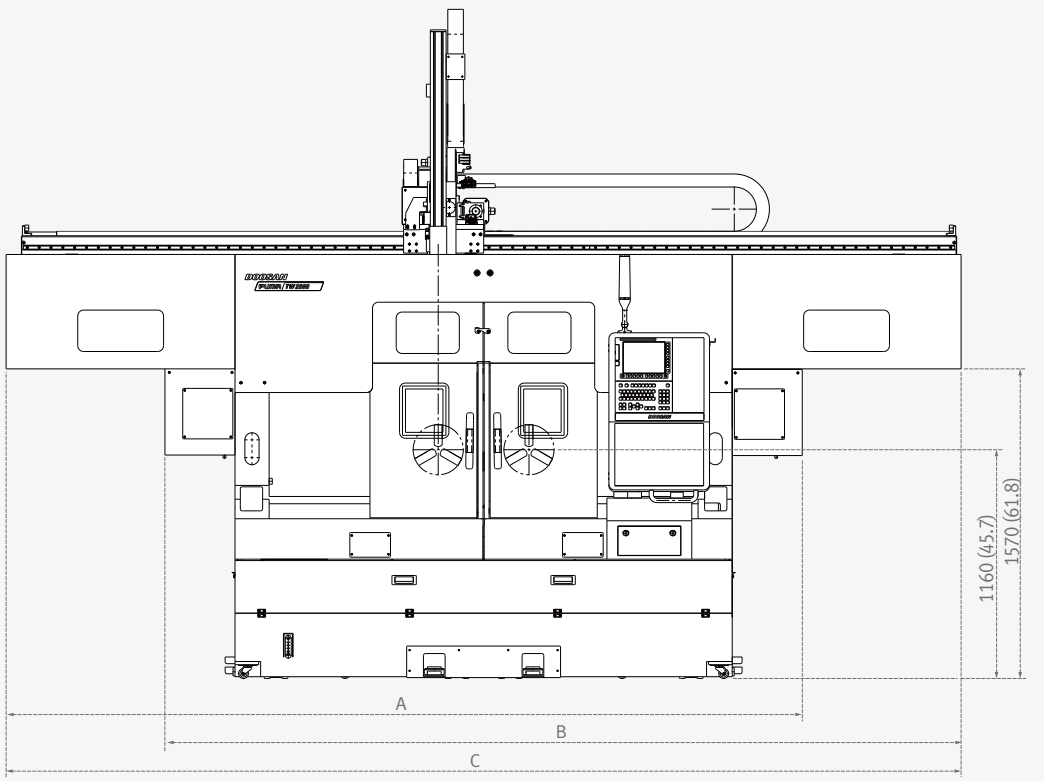
PUMA TW2600-GL

Unit: mm (inch)

Top View



Front View



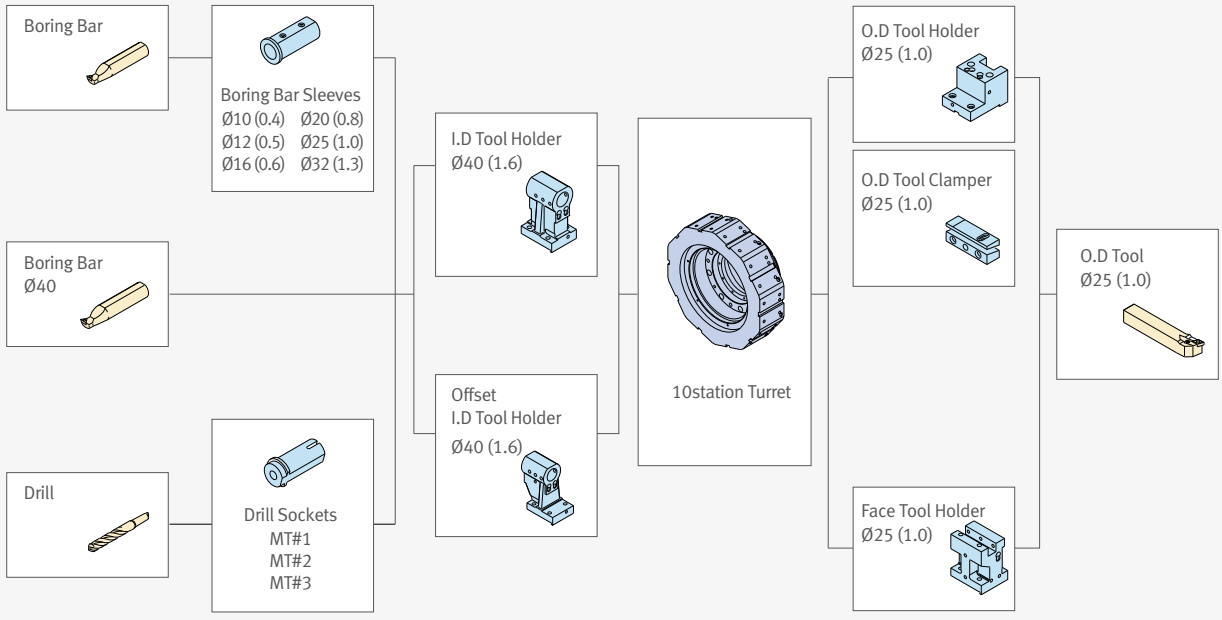
Unit: mm (inch)

	A	B	C
PUMA TW2600-GL (A1 type)	4150 (163.4)	-	-
PUMA TW2600-GL (A2 type)	-	4150 (163.4)	-
PUMA TW2600-GL (A3 type)	-	-	4840 (190.6)

Tooling System / Tool Interference Diagram

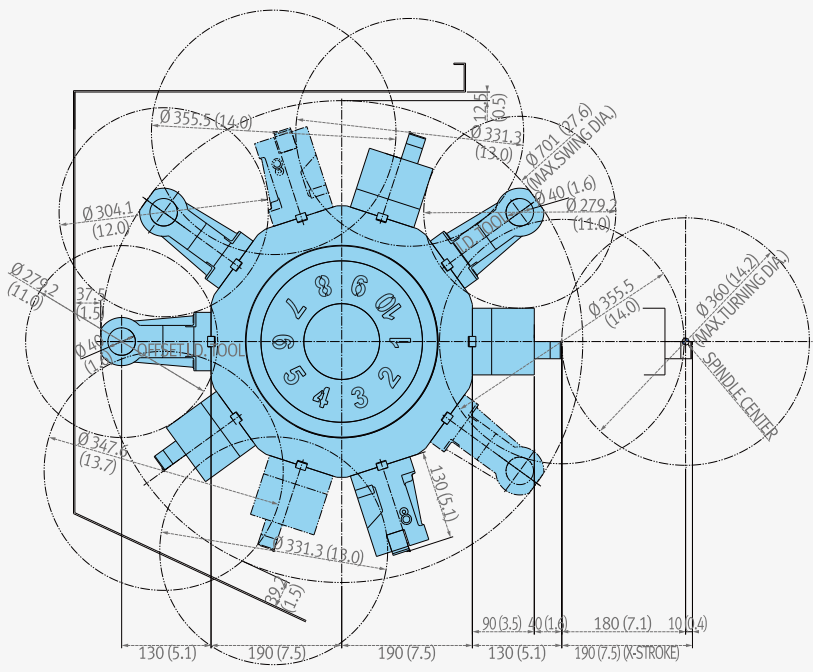
Tooling System

Unit: mm (inch)



Tool Interference

Unit: mm (inch)

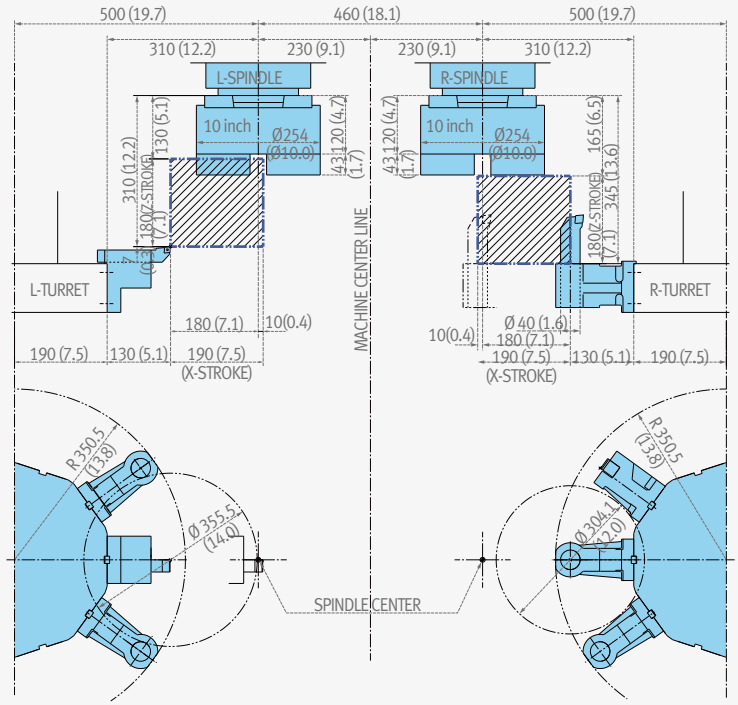


Working Range

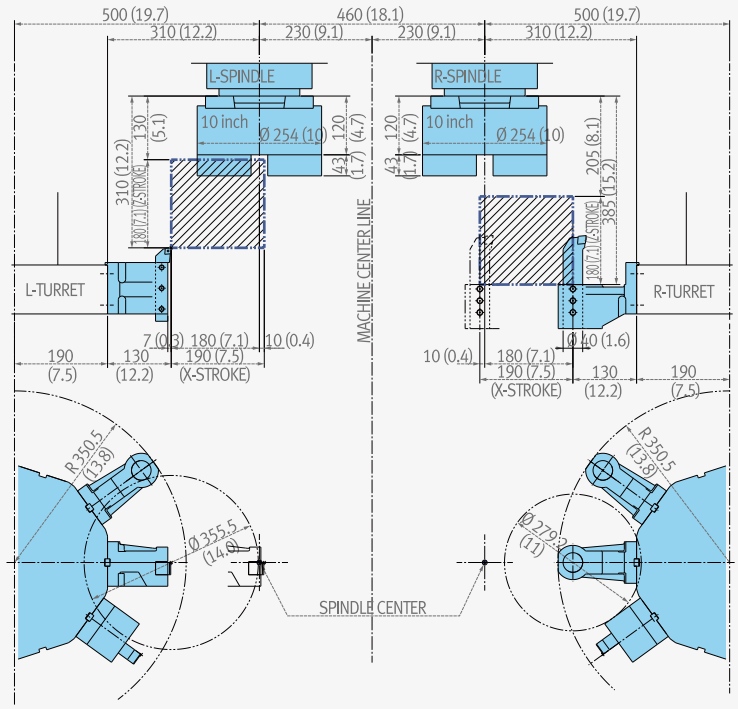
PUMA TW2600 series

Unit: mm (inch)

PUMA TW2600



PUMA TW2600-GL



Machine Specifications

Item			Unit	PUMA TW2600	PUMA TW2600-GL
Capacity	Recommended turning diameter		mm (inch)	Ø360 (Ø14.2)	Ø200 (Ø7.9)
	Max. turning diameter (Max. / Min.)		mm (inch)	Ø360 (Ø14.2)	Ø200 / Ø50 (Ø7.9 / Ø2.0)
	Max. turning length (Max. / Min.)		mm (inch)	170 (6.7)	95 / 165 (3.7 / 6.5)
	Chuck size	Standard	mm (inch)	Ø254 (Ø10)	
		Optional	mm (inch)	Ø210 (Ø8)	
Travel	Travel distance	X axis	mm (inch)	190(10+180) (7.5)((0.4+7.1))	
		Z axis	mm (inch)	180 (7.1)	
Feedrate	Rapid traverse	X axis	m/min (ipm)	24 (944.9)	
		Z axis	m/min (ipm)	24 (944.9)	
Spindle	Max. spindle speed		r/min	3500	
	Max. spindle power (30 min/cont.)	Standard	kW (hp)	18.5/15 (24.8/20.1)	
		Optional	kW (hp)	18.5/15 (24.8/20.1)	
	Max. spindle torque	Standard	N·m (ft-lbs)	202 (149.1)	
		Optional	N·m (ft-lbs)	404 (298.2)	
	Distance between left-right spindle centers		mm (inch)	460 (18.1)	
	Spindle nose		ASA	A2-6	
	Spindle bearing size (front face I/D)		mm (inch)	Ø110 (Ø4.3)	
	Spindle hole through diameter		mm (inch)	Ø61 (Ø2.4)	
Turret	No. of tool stations		ea	10+10	
	OD tool size		mm (inch)	Ø25 (Ø1)	
	Max. boring bar size		mm (inch)	Ø40 (Ø1.6)	
	Turret Indexing time (1 station swivel)		sec	0.16	
Power	Power consumption		kVA	92.4	
Dimensions	Length		mm (inch)	2520 (99.2)	4840 (190.6) (A3 type)
	Width		mm (inch)	2410 (94.9)	2775 (109.3) (A3 type)
	Height (Max. / Min.)		mm (inch)	2150 (84.6)	3513 / 2803 (138.3 / 110.4)
	Weight		kg (lbf)	7200 (15873.0)	
Control	CNC system			DOOSAN-FANUC i	

* { } : option

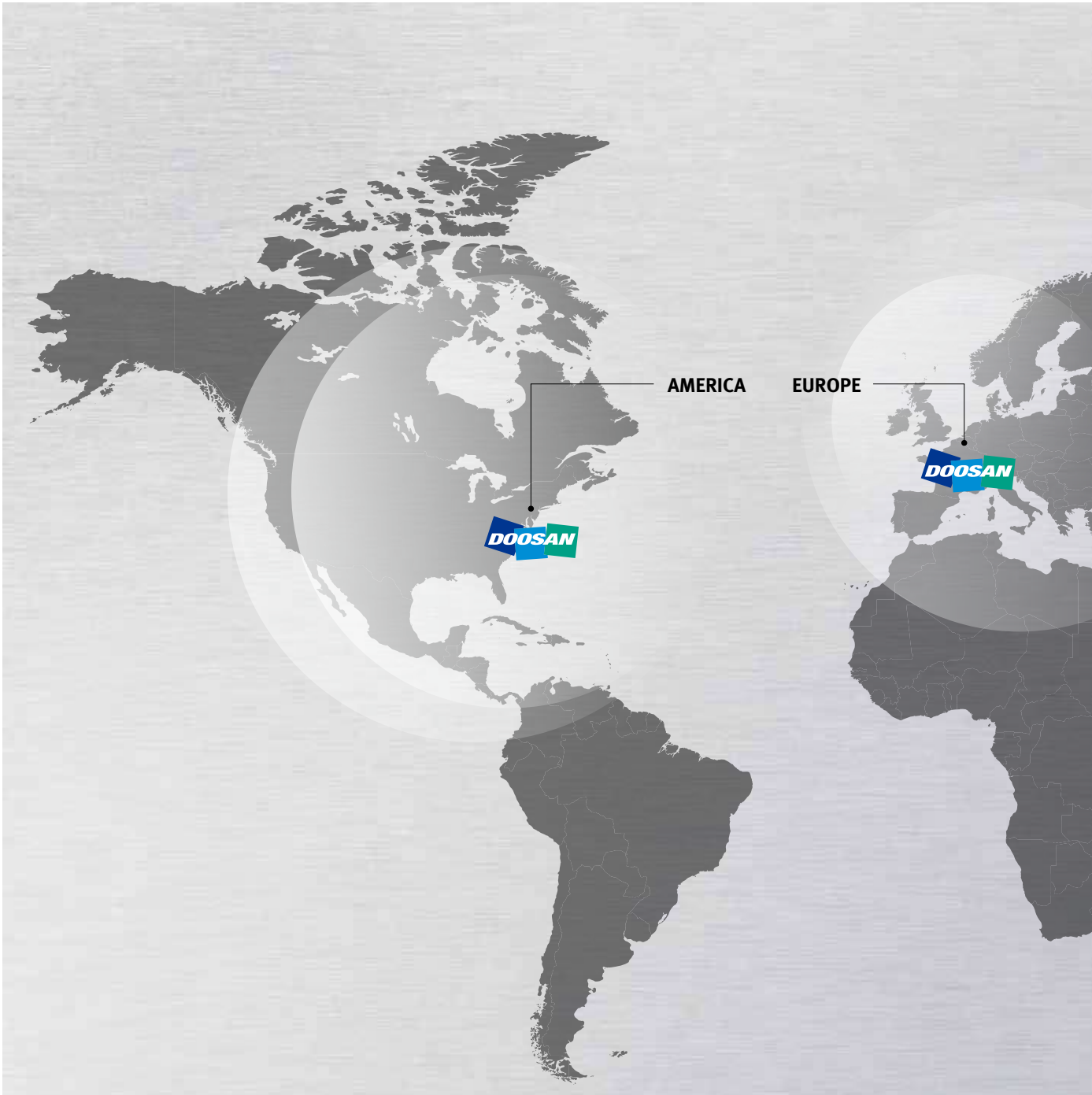
NC Unit Specifications

DOOSAN FANUC i

● standard features ○ option X Not available

No.	Item		Spec.	Doosan Fanuc i Series	
				PUMA TW2600	PUMA TW2600-GL
1	Control Axes	Controlled axes		4 (X1,Z1+X2,Z2)	7 (X1,Z1 + X2,Z2 + GX,GY,GZ)
2		Simultaneously controlled axes		2 axes (each path)	2 axes (each path) 3 axes(Gantry)
3		Inch/metric conversion		●	●
4		Stored limit check before move		●	●
5		Chamfering on/off		●	●
6		Unexpected disturbance torque detection function		●	●
7	Operation	DNC operation	Included in RS232C interface.	●	●
8		DNC operation with memory card		●	●
9		Tool retract and recover		○	○
10		Wrong operation prevention		●	●
11		Single block		●	●
12		Reference position shift		●	●
13		Handle interruption		○	○
14		Incremental feed	x1,x10,x100	●	●
15		Manual handle retrace		○	○
16	Interpolation Function	Nano interpolation		●	●
17		Linear interpolation		●	●
18		Circular interpolation		●	●
19		Thread cutting, synchronous cutting		●	●
20		Multi threading		●	●
21		Thread cutting retract		●	●
22		Continuous threading		●	●
23		Variable lead thread cutting		●	●
24		Circular thread cutting		○	○
25		High-speed skip	Input signal is 8 points.	●	●
26	Feed Function	Override cancel		●	●
27		AI contour control I		○	○
28		AI contour control II		○	○
29		Rapid traverse block overlap		●	●
30	Program Input	Optional block skip	9 pieces	●	●
31		Absolute/incremental programming	Combined use in the same block	●	●
32		Diameter/Radius programming		●	●
33		Automatic coordinate system setting		●	●
34		Workpiece coordinate system preset		●	●
35		Direct drawing dimension programming		●	●
36		Chamfering/Corner R		●	○
37		Custom macro		●	●
38		Addition of custom macro common variables	#100 - #199, #500 - #999	●	●
39		Interruption type custom macro		●	●
40		Canned cycle		●	●
41		Multiple repetitive cycles	G70~G76	●	●
42		Multiple repetitive cycles II	Pocket profile	●	●
43		Canned cycle for drilling		●	●
44		Coordinate system shift		●	●
45		Direct input of coordinate system shift		●	●
46		Pattern data input		●	●
47	Interactive Program	EZ Guidei(Conversational Programming Solution)		●	●
48		EZ Operation package		●	●
49	Auxiliary/Spindle Function	Arbitrary speed threading		○	○
50	Tool Function / Tool Compensation	Tool offset pairs	128-pairs	●	●
51		Tool offset pairs	200-pairs	○	○
52		Tool offset		●	●
53		Tool radius/Tool nose radius compensation		●	●
54		Tool geometry/wear compensation		●	●
55		Automatic tool offset		●	●
56		Direct input of offset value measured B		●	●
57		Tool life management		●	●
58	Accuracy Correction	Stored pitch error compensation		○	○
59	Editing	Part program storage size & Number of registerable programs	5120M(2MB)_1000 programs	○	○
60		Part program storage size & Number of registerable programs	2560M(1MB)_800 programs	●	●
61		Part program storage size & Number of registerable programs	5120M(2MB)_800 programs	○	○
62		Program protect		●	●
63		Password function		●	●
64		Playback		●	●
65	Data Input/ Output	Fast data server		○	○
66		Memory card input/output		●	●
67		USB memory input/output		●	●
68		Automatic data backup		●	●
69	Other Functions	Embedded Ethernet		●	●
70		Fast Ethernet		○	○
71	Other Functions	Display unit	10.4" color LCD	●	●

Responding to Customers Anytime, Anywhere



Global Service Support Network

Corporations	Dealer Networks	Technical Centers	Factories
5	122	18	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.

Domestic Service Support Network

Integrated Support Centers	Sales Branch Offices	Post-Sales Service Centers	Designated Repair Service Centers
2	7	6	31

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 TW2600 series

Description		Unit	PUMA TW2600	PUMA TW2600-GL
Max. turning diameter (Max. / Min.)		mm (inch)	Ø360 (Ø14.2)	Ø200 / Ø50 (Ø7.9 / Ø2.0)
Max. turning length (Max. / Min.)		mm (inch)	170 (6.7)	95 / 165 (3.7 / 6.5)
Chuck size		inch	10 {8/12}	
Travel distance	X / Z-axis	mm(inch)	190(180 + 10) (7.5)((7.1 + 0.4)) / 180 (7.1)	
Rapid traverse	X / Z-axis	m/min(ipm)	24 (944.9) / 24 (944.9)	
Spindle speed		r/min	3500	
Spindle motor power (S3 25%/cont.)		kW (hp)	18.5/15 (24.8/20.1)	
Spindle nose specification		ASA	A2-6	
Spindle bearing I·D		mm (inch)	Ø 110 (4.3)	
No. of tool stations		ea	10 + 10	
Machine dimensions (L x W)		mm (inch)	2520 x 2350 (99.2 x 92.5)	4840** x 2715 (190.6** x 106.9)
CNC specification		-	DOOSAN FANUC i	

* Chip conveyor excluded. ** Based on type A3 (stockers on the left/right)
{ } : optional

Doosan Machine Tools

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* For more details, please contact Doosan Machine Tools.
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