

**Doosan Machine Tools**

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Security level: 000  
Retention period: 000

# **PUMA TL2000/2500 series**

## **Twin Turret HTC**

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Doosan Machine Tools  
Marketing team

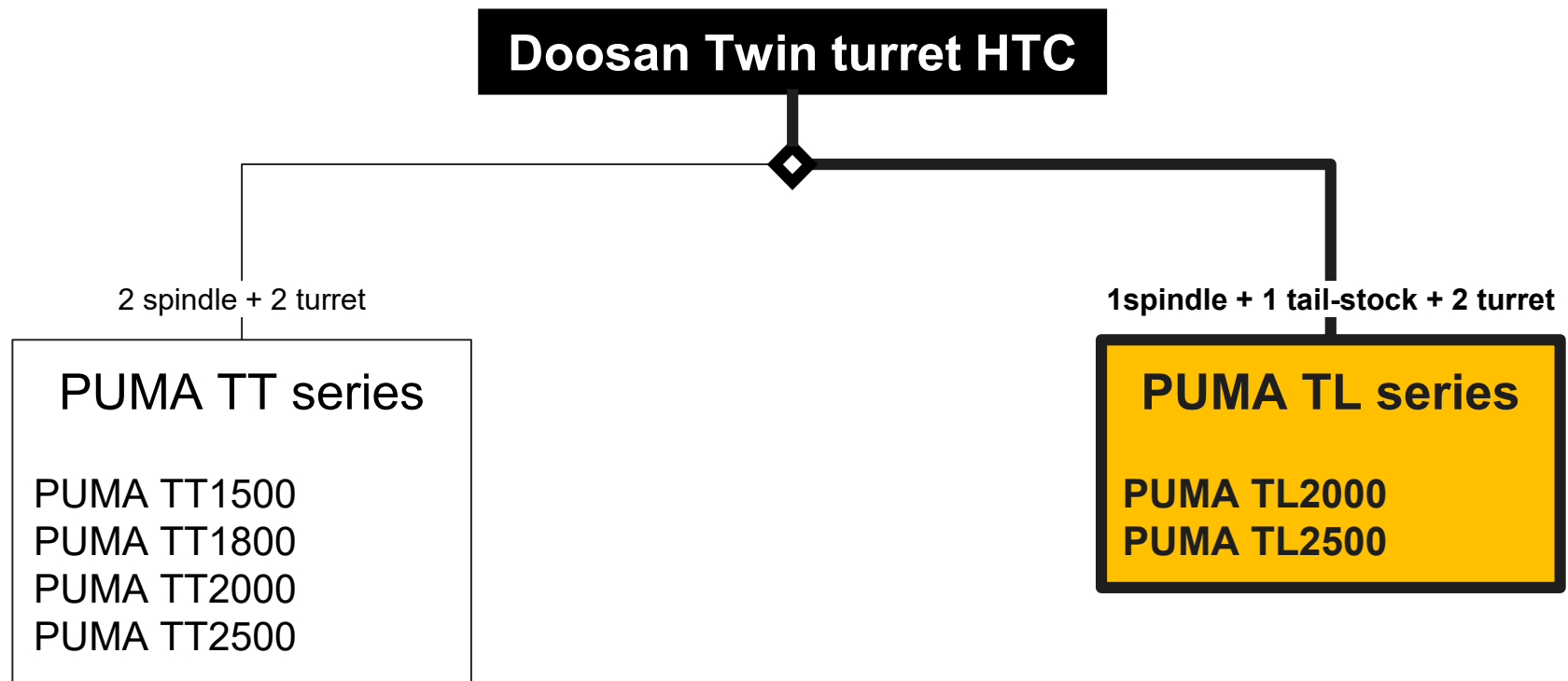
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**MACHINE  
GREATNESS™**



## Concept...



# PUMA TL series



Chuck size (inch) Left/Right	Bar working dia. (mm)	Max. turning dia. (mm): Up(M)/Low	Max. turning length (mm)	Standard	M	S	MS	SY	SY Y
				+ Programmable tailstock	Standard + Milling	Standard + Sub spindle	Standard + Milling + Sub spindle	Standard + Milling + upper Y axis + Sub spindle	Standard + Milling + upper and lower Y axis + Sub spindle
5	42	175	120					PUMA TT1300SY	PUMA TT1300SYY
6(Left)	51	175	120					PUMA TT1300SYB	PUMA TT1300SYYB
8	65	230	230				PUMA TT1800MS	PUMA TT1800SY	PUMA TT2100SYY
		370(350)/240	600	PUMA TL2000	PUMA TL2000M				
		350/240	1000	PUMA TL2000L	PUMA TL2000LM				
10(Left)	81	230	230					PUMA TT2100SYYB	
10	76	390/300	350				PUMA TT2500MS	PUMA TT2500SY	
		370(350)/240	600	PUMA TL2500	PUMA TL2500M				
			1000	PUMA TL2500L	PUMA TL2500LM				
		1250		PUMA TL2500XL	PUMA TL2500XLM				

Chuck size



## High productivity Multi-turret machine with 2-turret and 1-spindle

### Sales points...

- ① PUMA TL is suitable for Automobile Long Shaft Parts Machining
- ② Applying Built-in motor of Main spindle for high precision machining

PUMA TL2000



PUMA TL2500

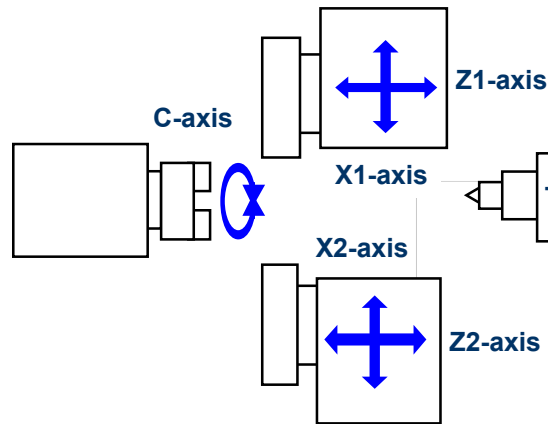


Model	PUMA TL2000		PUMA TL2500		
Bed Length	600mm	1000mm(L)	600mm	1000mm(L)	1250mm(XL)
Chuck size	8"		10"		
Max. Turning dia.	Upper : 370mm Lower : 240mm		Upper : 370mm Lower : 240mm		
Max. Turning length	600mm	1000mm	600mm	1000mm	1250mm
Turret	Upper : 12 stations Lower : 8 stations		Upper : 12 stations Lower : 8 stations		
X axis	Upper : 250mm Lower : 150mm		Upper : 250mm Lower : 150mm		
Z axis	650mm	1050mm	650mm	1050mm	1300mm
Spindle Speed	5000 r/min		4000 r/min		
Spindle Power/Torque	22kW, 476Nm		26kW, 433Nm		
Milling Speed	5000 r/min		5000 r/min		
Milling Power/Torque	5.5kW, 47Nm		5.5kW, 47Nm		
NC	DFi plus		DFi plus		

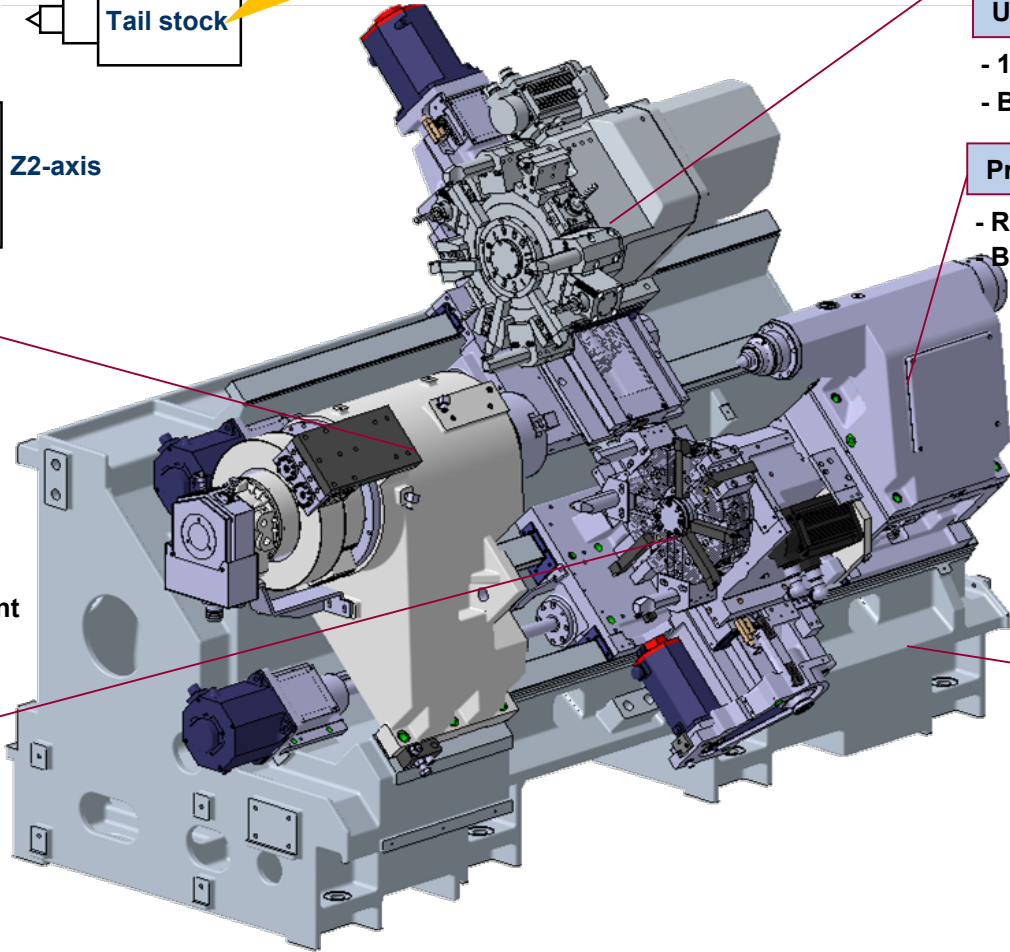
# PUMA TL SERIES STRUCTURE



Competitor machine video  
(Okuma LU series)



**Programmable Tailstock  
(By traction bar)**



**Main Spindle 1 (Turn)**

**Main Spindle 2 (Mill -Turn)**

- 8", 10" Chuck
- Point** Built-in Spindle Motor
- Full C-Axis Control (0.001°)
- C-Axis Contouring Improvement (Forced Lubrication)

**Lower Turret (Turn)**

- 8st. Servo Turret
- Steady Rest (Opt.)

**Upper Turret 1 (Turn)**

**Upper Turret 2 (Mill -Turn)**

- 12st. Servo Turret
- BMT55P Milling Head

**Programmable Tail-Stock**

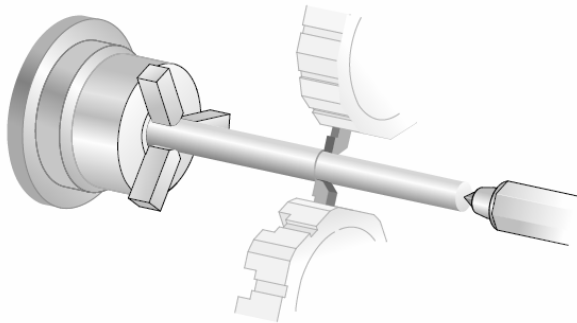
- Rotary Center : MT #5
- Built-in Center : MT #4 (Opt.)

**Bed**

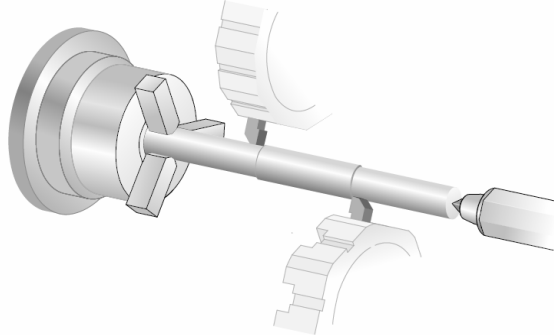
- Bed Slant Angle: 45deg.
- Std. Bed: 600mm
- Long Bed: 1,000mm



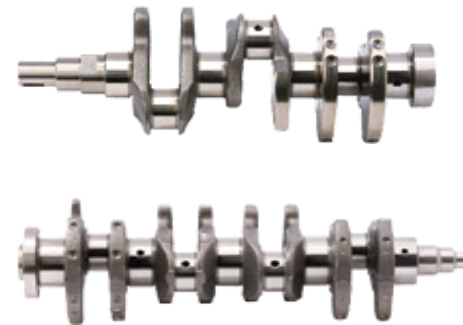
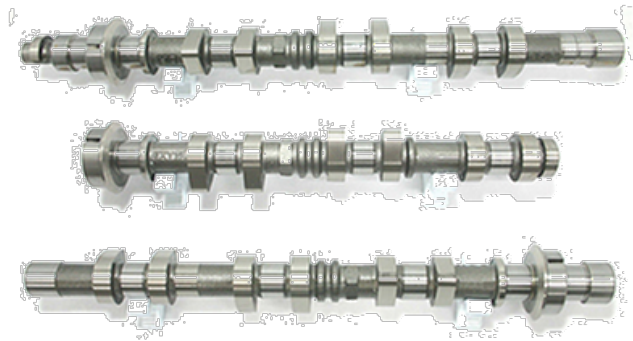
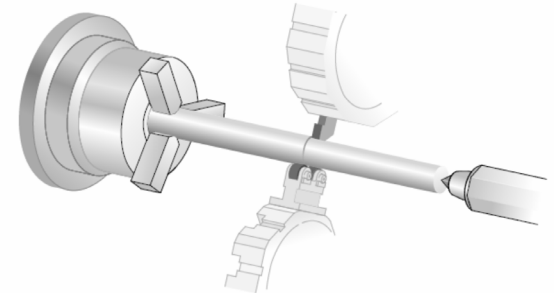
**Balanced Turning by 4-axis**



**Simultaneous 4-axis Turning**



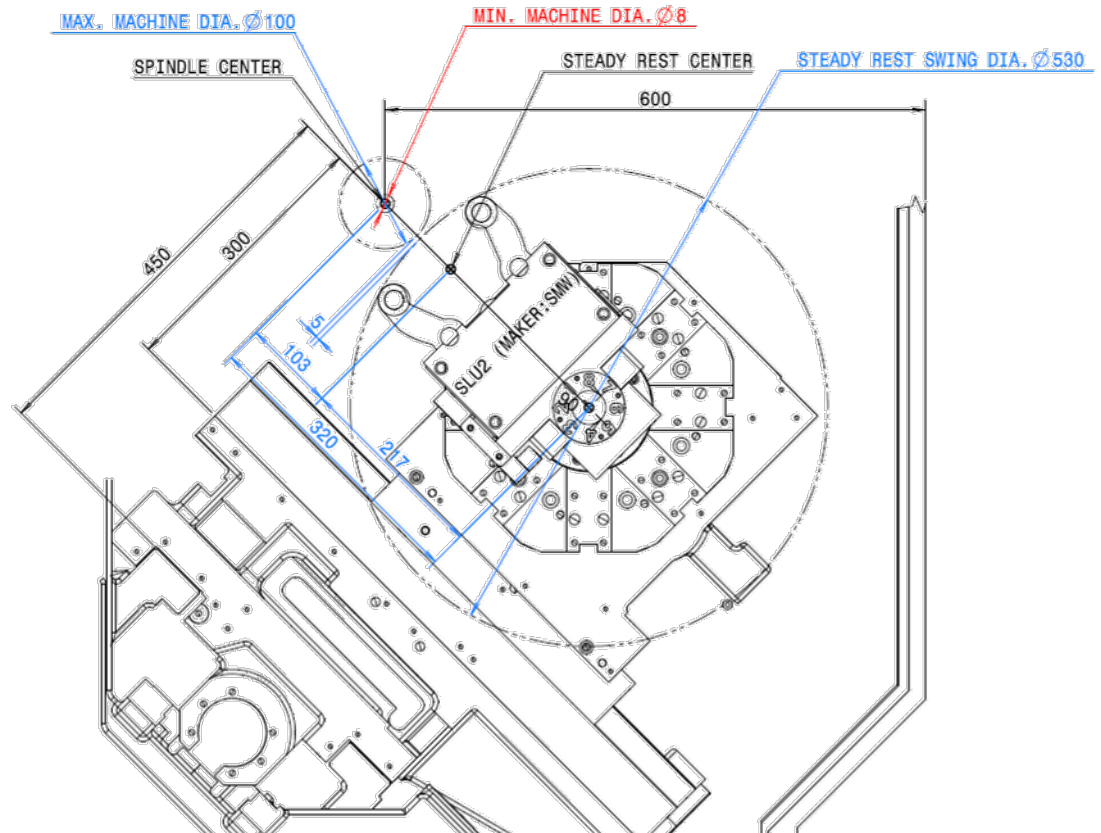
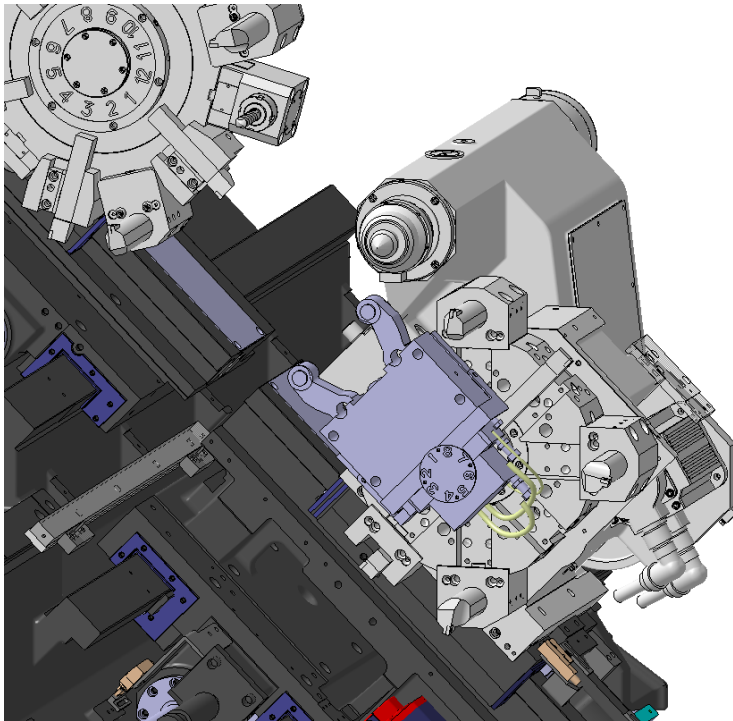
**Long Shaft Working by Follow Rest**



# [OPTION] AUTO STEADY REST



- Lower turret with Steady Rest (Auto Steady Rest)
- Allowable Workpiece Range :  $\varnothing 8 - \varnothing 100$  (SLU2)



# PUMA TL2000/2500 SPECIFICATION COMPARISON WITH COMPETITORS



Description		Unit	TL2000	TL2500	OKUMA	MORISEIKI			
					LU300(8",10")	ZL153	ZL203	ZL253	
<b>Capacity</b>	Swing over bed	mm	600		530	680		700	
	Swing over saddle(Upper)	mm	430		380	510		560	
	Max. Turning diameter(Upper)	mm	350(370)		370	440	390	390	
	Max. Turning length	mm	600 [1000]		600[1000]	495	453	615	
	Bar working diameter	mm	65	76		45	51[65]	73	
<b>Spindle</b>	Spindle speed	rpm	5,000	3,500	5,000[3,800]	5,000	4,000	3500	
	Spindle nose	ASA	A2#6	A2#8	A2#6[A2#8]	A2#5	A2#6	A2#8	
	Spindle bearing diameter (Front)	mm	110	130	100[120]	90	110	130	
	Spindle bore diameter	mm	76	90	62[80]	56	73	86	
<b>Tailstock</b>	Quill diameter	rpm	100		90	85		110	
	Quill bore taper	ASA	MT5		MT5	MT4		MT5	
	Quill travel	mm	120		120	120		150	
<b>Carriage</b>	Travel distance	X1/2-axis	X1:250 X2:150		X1:260 X2:140	X1: 235 X2: 175			
		Z1/2-axis	Z1:650 [1050] Z2:630 [1030]		Z1:640[1040] Z2:615[1015]	Z1:545 Z2:500	Z1:520 Z2:500	Z1:650 Z2:650	
	Rapid traverse	X1/2-axis	20		20	18			
		Z1/2-axis	24		25	24			
<b>Turret</b>	No. of tool stations(Upper+Lower)	ST.	12 + 8		12 + 8	12+12	12 + 8		
	OD tool height	mm	25		25	20	25		
	Boring bar diameter (Main/Sub)	mm	40		40	32	40		
	Indexing time	sec	0.15		0.18	0.2	0.3		
	Rotary tool Speed range	rpm	5,000		4,500*	3,000[4,000]*			
<b>Motors</b>	Spindle motor(Int./Cont)	kW	22/15	26/22	22/15	7.5/5.5 [11/7.5]	11/7.5	18.5/15 [22/15]	
	Rotary tool motor(Upper)	kW	5.5		7.0/3.0*	3.8/2.8*	6.5/4.3*		
	Servo motor	X1-axis	kW	3.0		3.0	1.0	1.6	
		X2-axis	kW	1.6		2.0	1.0	1.6	
		Z1-axis	kW	3.0		4.0	2.1	3.0	
		Z2-axis	kW	3.0		4.0	2.1	3.0	
<b>Others</b>	Machine height	mm	1,930		2,010[2,176]	2,106		2,070	
	Machine dimensions	length	mm	3,250	3,900	2,950[3,950]	3,968		4,061
		width	mm	2,118	2,144	2,050[2,280]	2,150		2,136
	Machine weight	kgf	7,000	8,200	6,700[8,200]	5,350	5,550	7,600	



# PUMA TL2500XL SPECIFICATION COMPARISON WITH COMPETITORS



Item	unit	OKUMA		DOOSAN	
		LU4000 EX (L) 2SC x 1250	LU4000 EX (M) 2SC x 1250	TL2500XL	TL2500XLM
Capacity	Swing over bed (mm)	ø695	ø695	600	600
	Max turning diameter (mm)	U: ø480, L: ø310	U: ø430, L: ø280	U : 370, L : 240	U : 350, L : 240
	Max work length (mm)	1,250	1,250	1250	1250
Travels	X-axis (mm)	U: 300, L: 195	U: 300, L: 195	U : 250, L : 150	U : 250, L : 150
	Z-axis (mm)	U: 1,340, L: 1,300	U: 1,340, L: 1,300	U : 1300, L : 1280	U : 1300, L : 1280
	Y-axis (mm)	-	-	-	-
	C-axis (deg)	-	360 (0.001°)	-	360 (0.001 deg.)
Spindle	Speed (r/min)	42 to 4,200 [30 to 3,000]	42 to 4,200 [30 to 3,000]	4000	4000
	Spindle noze	JIS A2-8 [JIS A2-11]	JIS A2-8 [JIS A2-11]	A2-8	A2-8
	Bore dia (mm)	ø91 [ø112]	ø91 [ø112]	86	86
	Front bearing dia (mm)	ø140 [ø160]	ø140 [ø160]	130	130
Turret	Type	U: V12, L: V10	U: V12 w/milling L: V10 only turning	DI	U : BMT 55P(milling) L : DI(only turning)
	No. of tools (ea)	U: 12/L: 10	U: 12 / L: 10	U : 12, L : 8	U : 12, L : 8
	OD tool shank height (mm)	25 (0.98)	25 (0.98)	25	25
	ID tool shank dia (mm)	ø40 (ø1.57)	ø40 (ø1.57)	40	40
	Turret 1st. index time (s)	0.23	0.23	0.15	0.15
Milling tool spindle	Spindle speed (r/min)	-	45 to 6,000	-	5000
Feedrates	Rapid traverse (m/min)	X: 25, Z: 30	X: 25, Z: 30, C: 200 r/min	X : 20, Z : 24	X: 20, Z: 24,C: 200r/min
	Quill dia (mm)	ø120	ø120	100	100
Tailstock	Quill bore taper	MT.No5[MT5 built-in]	MT.No5[MT5 built-in]	Live center MT#5	Live center MT#5
	Quill travel (mm)	150	150	120	120
	Spindle (kW)	22/15(30 min/cont) [32/22 (20 min/cont)]	22/15 (30 min/cont) [32/22 (20 min/cont)]	26/22(30 min/cont)	26/22(30 min/cont)
Motors	Spindle Max Torque (N.m)	700	700	433	433
	Milling tool (kW)	-	7.5/4.3 (25 min/cont)	-	5.5/1.1 (S3 25%/cont)
	Axis drive (kW)	XA:3.5, XB: 3.0, ZA: 4.6, ZB:4.6	XA:3.5, XB: 3.0, ZA: 4.6, ZB:4.6	X1:3.0, X2:1.6, Z1:3.0, X2:3.0	X1:3.0, X2:1.6, Z1:3.0, X2:3.0
	Coolant pump(50/60 Hz) (kW)	0.55/0.75	0.55/0.75	0.4	0.4
Machine size	Height (mm)	2,440	2,440	2115	2115
	Floor space (mm)	4,780 x 2,620	4,780 x 2,620	4510 x 2630	4510 x 2630
	Weight (kg)	11,400	11,500	9600	9600
CNC		OSP-P300LA	OSP-P300LA	DFi plus	DFi plus