



## CNC LATHES

### MOVE AHEAD WITH FORCE ONE

**Twin Spindle / Twin Turret**

FCL-15TT

FCL-20TT

FCL-25TT

**Twin Spindle / Single Turret**

FCL-15TS

FCL-20TS

FCL-25TS

# FCL-TS SERIES

## FCL-15TS

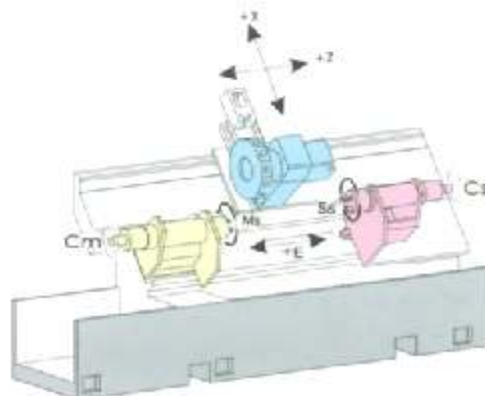
- Swing over bed  $\phi$  600 mm.
- Max. turning diameter  $\phi$  245 mm.
- Working length 260 mm.

## FCL-20TS

- Swing over bed  $\phi$  650 mm.
- Max. turning diameter  $\phi$  490 mm.
- Working length 500 mm.

## FCL-30TS

- Swing over bed  $\phi$  650 mm.
- Max. turning diameter  $\phi$  470 mm.
- Working length 470 mm.



## TWIN SPINDLE SINGLE TURRET

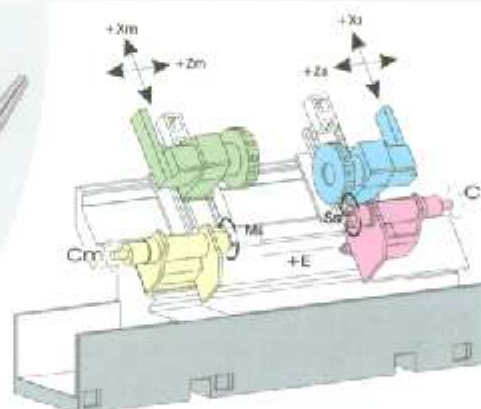
- Ms : Main Spindle  
Ss : Sub-spindle  
Cm : C axis / Main spindle  
Cs : C axis / Sub spindle

# FCL-TT SERIES



## TWIN SPINDLE TWIN TURRET

Ms : Main Spindle  
 Ss : Sub-spindle  
 Cm : C axis / Main spindle  
 Cs : C axis / Sub spindle



### FCL-15TT

- Swing over bed  $\phi$  620 mm.
- Max. turning diameter  $\phi$  440 mm.
- Working length 310 mm.

### FCL-20TT

- Swing over bed  $\phi$  620 mm.
- Max. turning diameter  $\phi$  440 mm.
- Working length 290 mm.

### FCL-25TT

- Swing over bed  $\phi$  620 mm.
- Max. turning diameter  $\phi$  440 mm.
- Working length 270 mm.

## RUGGEDLY AND PRECISELY CONSTRUCTED THROUGHOUT

- The major machine parts, such as the base, saddle, headstock, slide and sub spindle are made of Meehanite cast iron and tempered to relieve stress thereby ensuring lifetime accuracy.
- High performance servo motors are directly coupled to the pre-tensioned ball screws.
- Box guideways on the E axis. Linear guideways on the X and Z axes.
- 45 degrees slant bed construction features efficient chip removal and firm support.

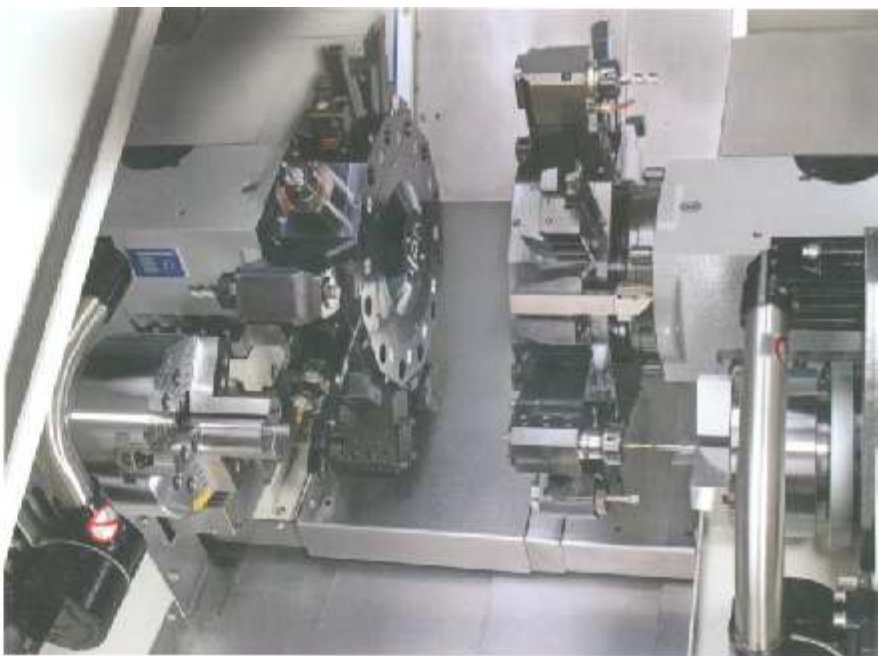


### C-AXIS (OPTIONAL)

- Employs Diplomatic SMBR-16 radial, VDI30, 12-position power turret with Fanuc servo motor. (Rotating tool holder and tools not included.)
- High indexing resolution of 0.001 for precision contour / index control.
- Hydraulic disk brake locking provides maximum stability during milling and contouring.

## TWIN SPINDLE TWIN TURRET

- The combination of the main spindle and sub-spindle enables the entire workpiece to be machined at one time.
- Twin turrets consists of two 12-position servo turrets.



## TWIN SPINDLE / SINGLE TURRET

- The combination of the main spindle and sub-spindle enable the entire workpiece to be machined at one time.
- A single 12-position hydraulic turret. (LS-240)



## TD AXIS WITH TURRET (Duplomatic)

- TD-axis & turret with a servo motor turret. The unit allows front and back machining with fast tool change.
- The turret disk and TD axis are driven by a motor.



## FAST TURRET INDEXING

- The 12-position turret features bi-directional random tool selection.
- Fast indexing time of 0.6 seconds.
- The turret accommodates 20 x 20 mm, O.D. tooling and 32 mm, I.D. tooling.



## PRECISION SPINDLE

- The cartridge type is conveniently removed allowing for convenient servicing.
- The spindle runs on class P4 precision bearings providing high axial thrust capability and superior radial stability. This ensures high precision during heavy duty turning.



**Advanced Design  
Concept Ensures  
User-friendly Operations!**



### HYDRAULIC POWER UNIT

- The hydraulic power unit employs high quality components for long service life and stable motions.
- The unit delivers high pressure to the turret, CS Brake and 3-jaw chuck.



**HIGH PRESSURE COOLANT PUMP**



**ELECTRICAL CABINET**



**FANUC CNC**

## SYNCHRONIZED MACHINING ON TWO SPINDLES

The main spindle and the sub-spindle run synchronizely permitting workpiece machining at one time.



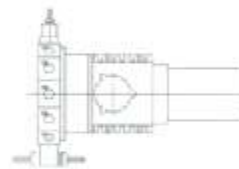
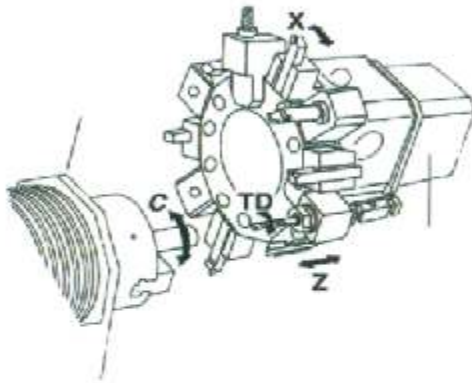
One cycle can finish front side & back machining / parts catcher

## MAIN SPINDLE TOOL SETTER AND SUB-SPINDLE TOOL SETTER

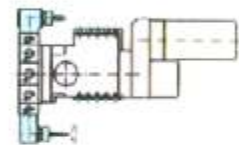
Designed for reducing tool set-up time, the tool setter automatically detects tool wear condition.



Parts Cut-off Detector



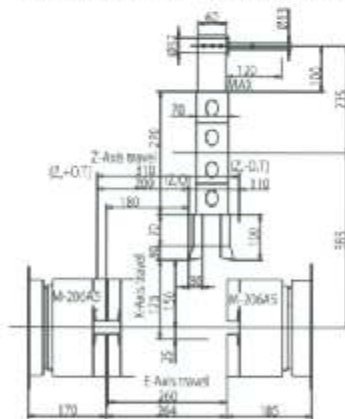
Radial VDI Turret Front and Back Machining  
(Hydraulic Turret for TS Series)  
(Servo Turret for TT Series)



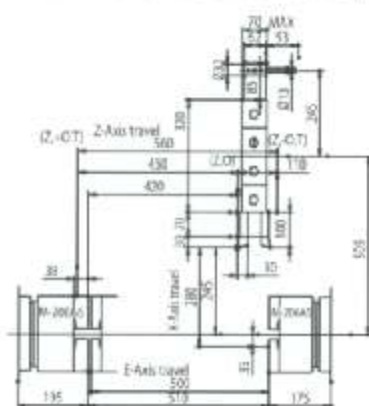
Radial Driven Tool System VDI Servo Turret  
Front and Back Machining  
(Opt. for TS, TT Series)

FCL-15TS

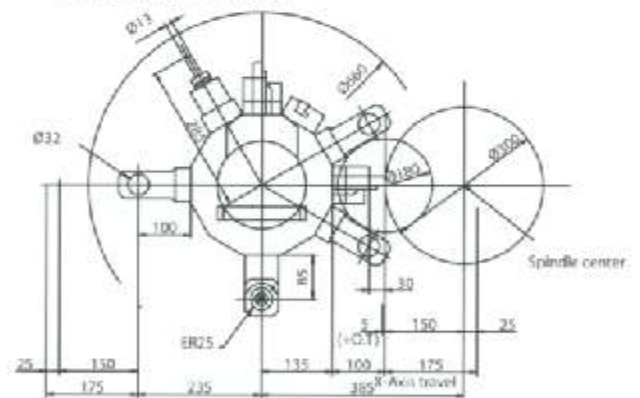
V.D.I. Turret W/C-Axis Moving Range



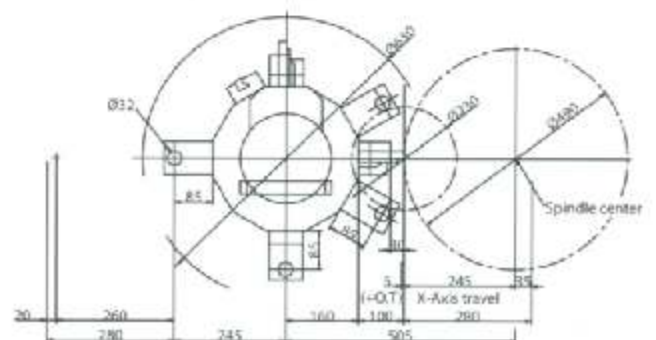
V.D.I. Turret W/C-Axis Moving Range



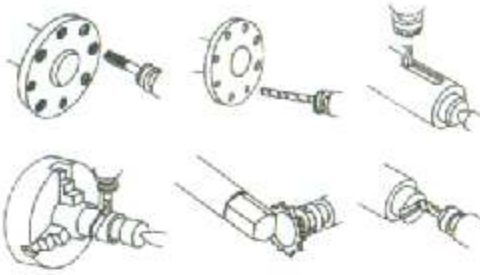
Relation Between Tool and Work Dia.(V.D.I Tool)



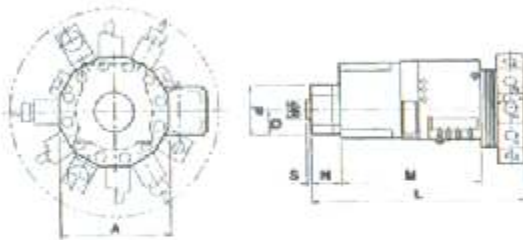
Relation Between Tool and Work Dia.(V.D.I Tool)



## C-Axis Process Drawing



## VDI for reference only



## Specifications

MODEL	FCL-15TS/20TS	FCL-30TS
C-Axis Precision	0.001	
Power Turret	Type 16	Type 20
Max. Speed	4000 rpm	4000 rpm
Drilling	φ 1-13mm	φ 2.5-20mm
Milling	φ 1-13mm	φ 2.5-20mm
Taper	M1-M10	M3-M12
Tool Shank Size	φ 32mm	φ 40mm
Motor	AC 3.0 KW	AC 3.0 KW

## Direct Mount

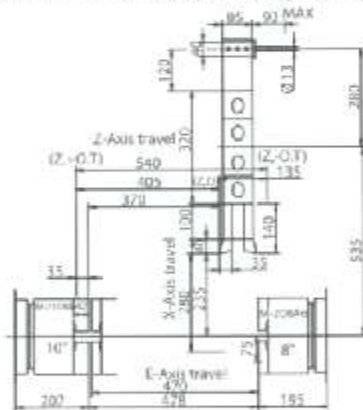
NO.	TOOL/MODEL	FCL-15TS/20TS	FCL-30TS
		φ 8, φ 10, φ 12, φ 16, φ 20, φ 25, φ 32	φ 8, φ 10, φ 12, φ 16, φ 20, φ 25, φ 32, φ 40
1	Bore		
2	Shank Dia.	□20(25 opt.)	□25
3	End	□20(25 opt.)	□25
4	Cut	20	25
5	Top	φ 16	φ 20
6	Drill	MT#2, #3	MT#2, #3, #4

## VDI

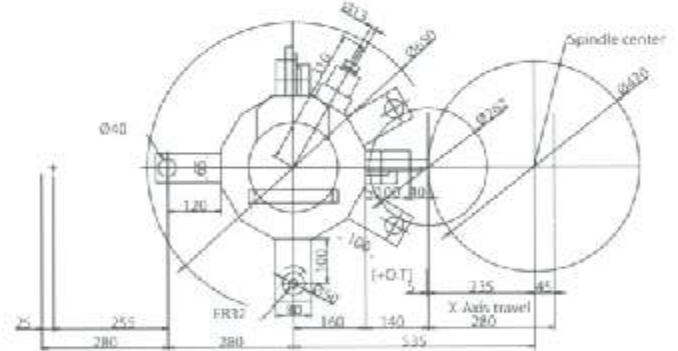
NO.	TOOL/MODEL	FCL-15TS/20TS	FCL-30TS
		φ 8, φ 10, φ 12, φ 16, φ 20, φ 25, φ 32	φ 8, φ 10, φ 12, φ 16, φ 20, φ 25, φ 32, φ 40
1	Bore		
2	Shank Dia.	□20(25 opt.)	□25
3	End	□20(25 opt.)	□25
4	Cut	20	25
5	Top	M10	M16
6	Drill	MT#1, #2, #3	MT#2, #3, #4

## FCL-30TS

V.D.I. Turret W/C-Axis Moving Range

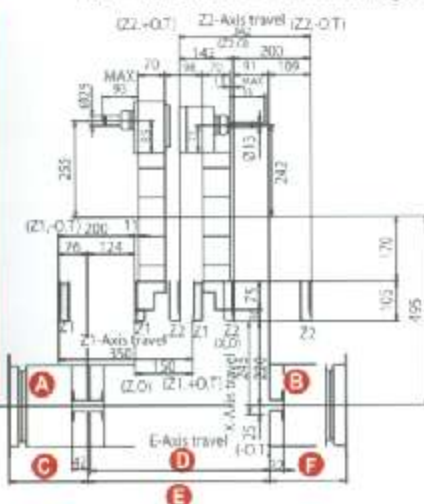


Relation Between Tool and Work Dia. (V.D.I Tool)



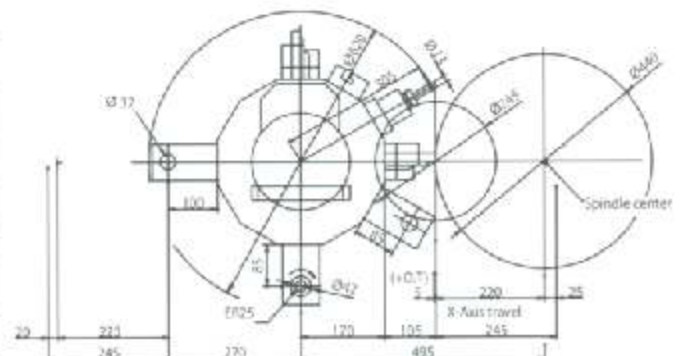
## FCL-TT Series

V.D.I. Turret W/C-Axis Moving Range



MODEL ITEM	15TT	20TT	25TT
A	M 206A5	M 206A6	M 210A4
B	M 206A5	M 206A5	M 206A6
C	170	185	207
D	520	505	470
E	526	511	475
F	195	186	200

Relation Between Tool and Work Dia. (V.D.I Tool)



## Specifications:

MODEL	FCL-15TT		FCL-20TT		FCL-25TT		
<b>Capacity</b>	No. of Axes	STD:5-Axis OPT:7-Axis (C-Axis)		STD:5-Axis OPT:7-Axis (C-Axis)		STD:5-Axis OPT:7-Axis (C-Axis)	
	Swing Over Bed	φ 620mm (24.41")		φ 620mm (24.41")		φ 620mm (24.41")	
	Max. Turning Dia.	φ 440mm (17.32")		φ 440mm (17.32")		φ 440mm (17.32")	
	Working Length	310mm (12.20")		290mm (11.41")		270mm (10.62")	
<b>Main and Sub Spindle</b>	Spindle Nose Bar Internal Taper	L:ASA A2-5 R:ASA A2-5		L:ASA A2 φ R:ASA A2-5		L:ASA A2 φ R:ASA A2-φ	
	Spindle Bore	φ 56mm (2.2")	φ 56mm (2.2")	φ 61mm (2.4")	φ 56mm (2.2")	φ 77mm (3")	φ 61mm (2.4")
	Bar Capacity	φ 45mm (1.7")	φ 45mm (1.7")	φ 51mm (2")	φ 45mm (1.7")	φ 65mm (2.5")	φ 51mm (2")
	Range of Spindle Speed	10-6000rpm	10-6000rpm	10-4200rpm	10-6000rpm	10-3600rpm	10-4200rpm
	Living Tools Speed	OPT:25-4000ipm		OPT:25-4000ipm		OPT:25-4000ipm	
	No. of Spindle Speed	Infinitely variable		Infinitely variable		Infinitely variable	
<b>Chuck</b>	Hydraulic Chuck	φ 169mm (6")	φ 169mm (6")	φ 210mm (8")	φ 169mm (6")	φ 254mm (10")	φ 210mm (8")
	<b>Turret (T/R)</b>	Tool Station (Random)	Servo-VDI30-12T		Servo VDI30-12T		Servo VDI30-12T
O.D. Tooling		20x20mm		20x20mm		20x20mm	
I.D. Tooling		φ 32mm (1.26")		φ 32mm (1.26")		φ 32mm (1.26")	
<b>Cross Slide (X), Z2 Axis) and Carriage (Z1, Z2 Axis, E Axis)</b>	X1, X2 Axis Travel	245mm (9.64")		245mm (9.64")		245mm (9.64")	
	Z1, Z2 Axis Travel	342mm (13.46")		342mm (13.46")		342mm (13.46")	
	E Axis Travel	520mm (20.47")		500mm (19.68")		470mm (18.5")	
	Rapid Traverse Speed(X1, X2 Axis)	20m/min (787ipm)		20m/min (787ipm)		20m/min (787ipm)	
	Rapid Traverse Speed(Z1, Z2 Axis)	20m/min (787ipm)		20m/min (787ipm)		20m/min (787ipm)	
	Rapid Traverse Speed (E Axis)	20m/min (787ipm)		20m/min (787ipm)		20m/min (787ipm)	
	Cutting Feed Rate (X and Z Axis)	0.001-500mm/rev.		0.001-500mm/rev.		0.001-500mm/rev.	
	<b>Motor</b>	Main Spindle (Continuous)	φ 121	5.5kw (7.5HP)	φ 181	9kw (12HP)	φ 221
Main Spindle (30 min. Rating)		7.5kw (10HP)		11kw (15HP)		15kw (20HP)	
Sub Spindle (Continuous)		φ 61	5.5kw (7.5HP)	φ 61	5.5kw (7.5HP)	φ 61	7.5kw (10HP)
Sub Spindle (30 min. Rating)			7.5kw (10HP)		7.5kw (10HP)		11kw (15HP)
X1, X2 Axis		φ 88/3000 1.6kw (2.15HP)x2		φ 88/3000 1.6kw (2.15HP)x2		φ 128/3000 3kw (4HP)x2	
Z1, Z2 Axis		φ 88/3000 1.6kw (2.15HP)x2		φ 88/3000 1.6kw (2.15HP)x2		φ 88/3000 1.6kw (2.15HP)x2	
E Axis	φ 88/3000 1.6kw (2.15HP)		φ 88/3000 1.6kw (2.15HP)		φ 88/3000 1.6kw (2.15HP)		
<b>Tank Capacity</b>	Hydraulic Pump	1.5kw (2HP)		1.5kw (2HP)		1.5kw (2HP)	
	Coolant Pump	750w (1HP)x2		750w (1HP)x2		750w (1HP)x2	
<b>Hydraulic Tank</b>	Hydraulic Tank	60 Liter		60 Liter		60 Liter	
	Coolant Tank	100 Liter		100 Liter		100 Liter	
<b>Measurements</b>	Floor Space (L x W)	4150 x 2100mm		4150 x 2100mm		4150 x 2100mm	
	Height	2350mm		2350mm		2350mm	
	Weight (Nw / GW)	7160 kg / 7830 kg		7300 / 8000 kgs		7400 / 8100 kgs	

### Standard Accessories:

1. High Pressure Cooling System (3 Bar)
2. 100 Liter Capacity Cooling Tank
3. Servo Turret 12-Position
4. Auto Lubrication System
5. Tool Kit
6. Work Light
7. Tricolor Alarm Light
8. Hydraulic Unit
9. Heat Exchanger for Electric Cabinet
10. Chip Conveyor and Bucket

### Optional Accessories:

1. C.E. Electric Control
2. Auto Tool Setter Measurement
3. Manual Tool Setter Measurement
4. Cs axis Contour Capability
5. Main Transformer
6. Safety Door Interlocker
7. Sub Spindle Parts Catcher and bouncing equipment
8. Prevent Crash Install of Each Axis(Safety Equipment)
9. Bar Feeder
10. Parts Cut off Detector

## Specifications:

MODEL	FCL-15TS		FCL-20TS		FCL-30TS			
Capacity	No. of Axes	STD:3-Axis OPT:5-Axis (C-Axis)		STD:3-Axis OPT:5-Axis (C-Axis)		STD:3-Axis OPT:5-Axis (C-Axis)		
	Swing Over Bed	φ 600mm (23.62")		φ 650mm (25.59")		φ 650mm (25.59")		
	Max. Turning Dia.	φ 245mm (9.64")		φ 490mm (19.29")		φ 470mm (18.5")		
	Working Length	260mm (10.23")		500mm (19.68")		470mm (18.5")		
Main and Sub Spindle	Spindle Nose Bar Internal Taper	L:ASA A2-5 R:ASA A2-5		L:ASA A2-6 R:ASA A2-5		L:ASA A2-8 R:ASA A2-6		
	Spindle Bore	φ 56mm (2.2")	φ 56mm (2.2")	φ 61mm (2.4")	φ 56mm (2.2")	φ 90mm (3.54")	φ 61mm (2.4")	
	Bar Capacity	φ 45mm (1.7")	φ 45mm (1.7")	φ 51mm (2")	φ 45mm (1.7")	φ 77mm (3")	φ 51mm (2")	
	Range of Spindle Speed	10-6000rpm		10-6000rpm		10-3500rpm		
	Living Tools Speed	OPT:25-4000rpm		OPT:25-4000rpm		OPT:25-4000rpm		
	No. of Spindle Speed	Infinitely variable		Infinitely variable		Infinitely variable		
Chuck	Hydraulic Chuck	φ 169mm (6")	φ 169mm (6")	φ 210mm (8")	φ 169mm (6")	φ 254mm (10")	φ 210mm (8")	
	Tool Station (Random)	STD:4wd 13-240-12T OPT:Servo 13-240-12T		STD:4wd 13-240-12T OPT:Servo 13-240-12T		STD:4wd 13-240-12T OPT:Servo 13-240-12T		
Turret	O.D. Tooling	20x20mm		20x20mm		25x25mm		
	I.D. Tooling	φ 32mm (1.26")		φ 32mm (1.26")		φ 40mm (1.57")		
	X Axis Travel	165mm (6.5")		280mm (11.02")		280mm (11.02")		
Cross Slide (X Axis) and Carriage (Z Axis, E Axis)	Z Axis Travel	310mm (12.2")		560mm (22.05")		540mm (21.26")		
	E Axis Travel	260mm (10.23")		500mm (19.68")		470mm (18.5")		
	Rapid Traverse Speed [X Axis]	30m/min (1180ipm)		30m/min (1180ipm)		30m/min (1180ipm)		
	Rapid Traverse Speed [Z Axis]	30m/min (1180ipm)		30m/min (1180ipm)		30m/min (1180ipm)		
	Rapid Traverse Speed [E Axis]	20m/min (787ipm)		20m/min (787ipm)		20m/min (787ipm)		
	Cutting Feed Rate [X and Z Axis]	0.001-500mm/rev.		0.001-500mm/rev.		0.001-500mm/rev.		
	Motor	Main Spindle (Continuous)	φP121	5.5kw (7.5HP)	φP181	9kw (12HP)	φP221	11kw (15HP)
		Main Spindle (30 min.Rating)		7.5kw (10HP)		11kw (15HP)		15kw (20HP)
Sub Spindle (Continuous)		φ61	5.5kw (7.5HP)	φ61	5.5kw (7.5HP)	φ81	7.5kw (10HP)	
Sub Spindle (30 min.Rating)			7.5kw (10HP)		7.5kw (10HP)		11kw (15HP)	
X Axis		φ 88V/3000 1.6kw (2.15HP)		φ 88V/3000 1.6kw (2.15HP)		φ 128V/3000 3.0kw (4HP)		
Z Axis		φ 8V/3000 1.6kw (2.15HP)		φ 8V/3000 1.6kw (2.15HP)		φ 12V/3000 3.0kw (4HP)		
E Axis	φ 8V/3000 1.6kw (2.15HP)		φ 8V/3000 1.6kw (2.15HP)		φ 8V/3000 1.6kw (2.15HP)			
Tank Capacity	Hydraulic Pump	1.5kw (2HP)		1.5kw (2HP)		1.5kw (2HP)		
	Coolant Pump	750w (1HP)		750w (1HP)		750w (1HP)		
	Hydraulic Tank	60 Liter		60 Liter		60 Liter		
	Coolant Tank	100 Liter		100 Liter		100 Liter		
Measurements	Floor Space (L x W)	3750 x 2000mm		4150 x 2100mm		4150 x 2100mm		
	Height	2000mm		2100mm		2100mm		
	Weight (Nw / GW)	6280 kg / 6380 kg		6440 kg / 7030 kg		6630 kg / 7280 kg		

### Standard Accessories:

1. High Pressure Cooling System (3 Bar)
2. 100 Liter Capacity Cooling Tank
3. Hydraulic Turret 12-Position
4. Auto Lubrication System
5. Tool Kit
6. Work Light
7. Tricolor Alarm Light
8. Hydraulic Unit
9. Heat Exchanger for Electric Cabinet
10. Chip Conveyor and Bucket

### Optional Accessories:

1. C. E. Electric Control
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