FOCUSCNC®

FNL-220Y / 220LY / 220LSY Series

CNC Turning-Milling Machines Linear Way

CE

ISO 9001:2000 SGS

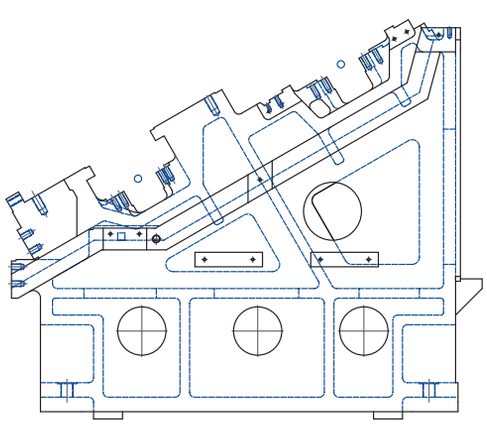
UKAS QUALITY MANAGEMENT 005

Multi-functional CNC Turning And Milling

The newly designed, multi-functional FNL-220LSY Series multi-axis lathe incorporates many innovative features. This machine is designed with a 30-degree slant bed, rigid linear way structure and programmable tailstock.
Features includes a sixty-degree, compound Y-axis, slant bed design with roller linear ways. Linear roller guide ways ensure the highest accuracy during high-speed machining. These guide ways provide 30% stronger rigidity than regular ball ways. Another features include turning and milling with first and second operations in one machine. The Y-axis travel (±55mm from the centerline) for off-center milling is the largest range in its class. The series includes high-torque live tooling, with full C-axis for the main and sub-spindle. The ability to turn and mill complex parts and perform multiple operations on one machine increases throughput and reduces handling.
The multi-functional design of FNL Series offers ease of operation and increased productivity with complex and intricate workpieces. And the machine is superior to the competition with a competitive price.

FNL-220LSY Series

Swing Over Bed (Z Cover): 620mm
Spindle Motor: up to 20HP
Max. Spindle Speed: 4,500rpm
Bar Capacity: up to 65mm
Max. Cutting Length: up to 510mm
Max. Cutting Diameter: 270mm
Chuck Size: 8"



FNL Series Slanted Bed Design

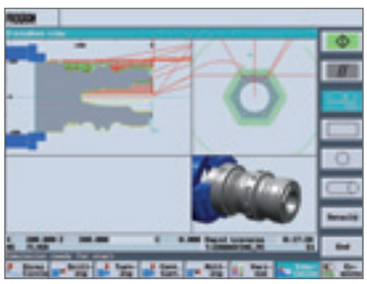
- High rigidity bed design, swing over bed is 620mm High-performance for maximum workpiece 270mm in diameter.
- Slant bed structure with low center of gravity, easy access and workpiece changeovers. Improved chip removal helps prevent thermal deformation.

Controller

FANUC Controller

SIEMENS

Uses a 10.4”screen for easy operation. Optional Shop Turn function with integrated operating system. Finish programming without having to use G code.



- 2 window view dynamic simulation
- 3D finished part simulation (opt.)
- 3D section view (opt.)

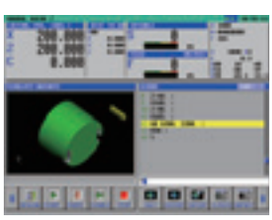
- Simultaneously Controlable axes: 4
- Minimum programable increment: 0.001mm (0.0001")
- Program storage length: 1280m (512k)
- 10.4" TFT LCD
- Mirror image
- Backlash compensation
- Stored pitch error compensation
- Chuck and tail stock barrier

Programming Features

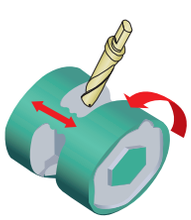
- DNC operation with Cf card / USB / RJ45
- Program and sequence number search
- Manual reference position return
- Linear and circular interpolation
- Helical interpolation
- Rigid tapping
- Rotary axis roll over function
- Coordinate system settings
- Direct input of coordinate system shift
- Direct drawing dimension programming
- Canned cycles for drilling
- Manual Guide i
- Constant surface speed control
- Part Program Editing
- Background editing
- Operator massage history display
- Actiual cutting feed rate display
- Display Od spindle speed and T code at all screens
- Dynamic graphic display
- Data protection key
- Dry run
- Single block
- JOG feed
- Skio function

Manual Guide i

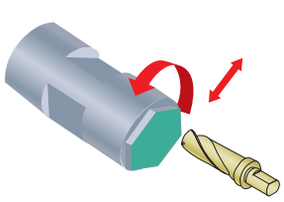
Graphic simulation



Polar Coordinate



Cylindrical Interpolation



Thread repair function

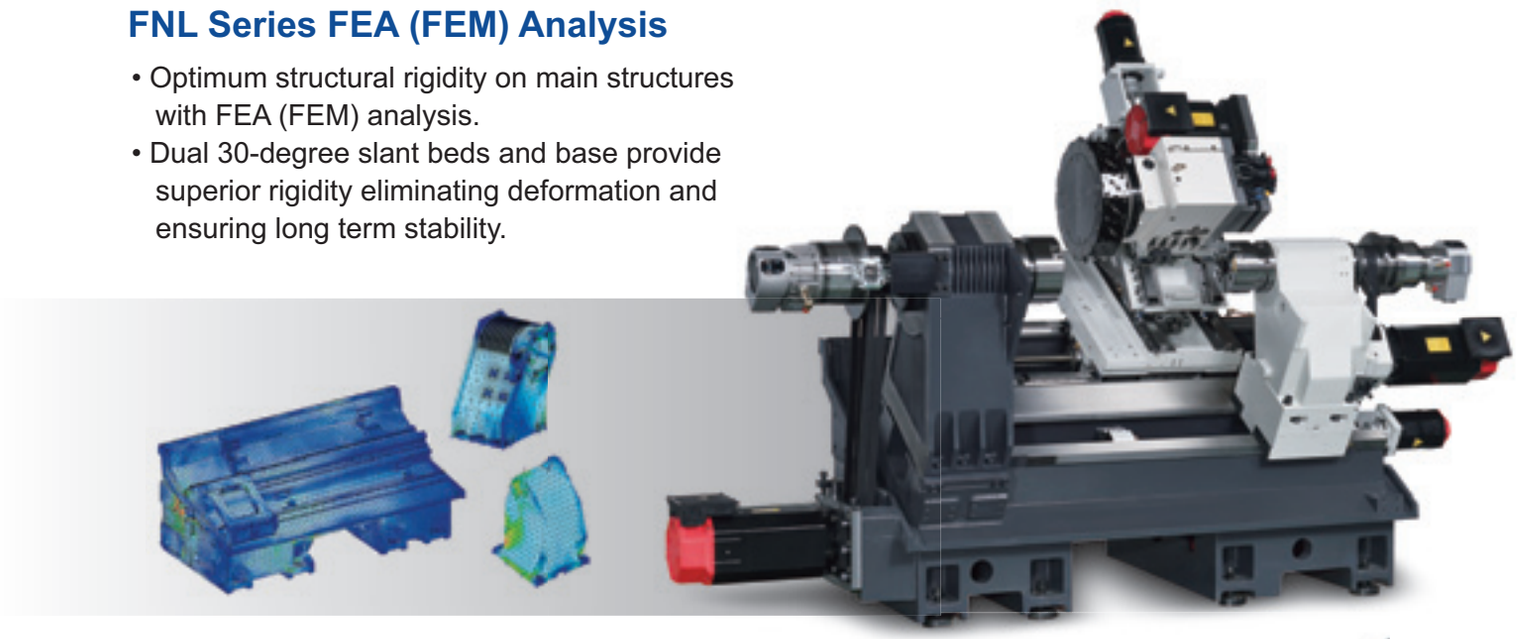
Linear Way Structures

FNL Series - Linear Way

A dual 30-degree slant bed design with roller linear ways structure that delivers low-friction, high-stiffness, high-load carrying capacity. Reduces vibration and stick-slip issues.

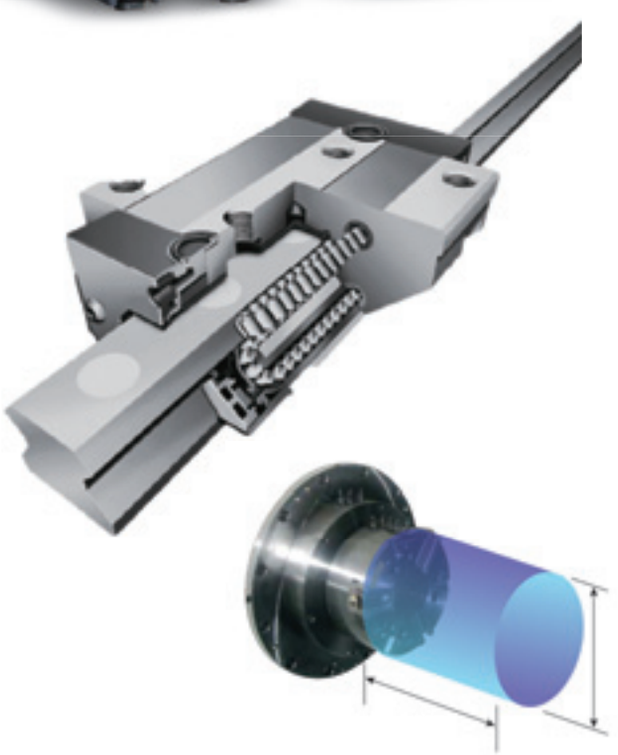
FNL Series FEA (FEM) Analysis

- Optimum structural rigidity on main structures with FEA (FEM) analysis.
- Dual 30-degree slant beds and base provide superior rigidity eliminating deformation and ensuring long term stability.



FNL Series - Extremely Rigid Structure

The series features a heavy-duty guideway design on X,Y,Z-axis. The travel distance on X, Z, Y and C1-C2-axes are 200mm by 560mm by 110mm(±55) by 360-degrees with a rapid traverse rate of 30m/min. One-piece Meehanite cast iron machine base design features heavy-duty large box ways, which have been hardened and ground then coated with Trucite. The wide span in-between linear ways ensure maximum stability when machining heavy loads.



FNL Series Machining Range

X-axis Travel
200mm

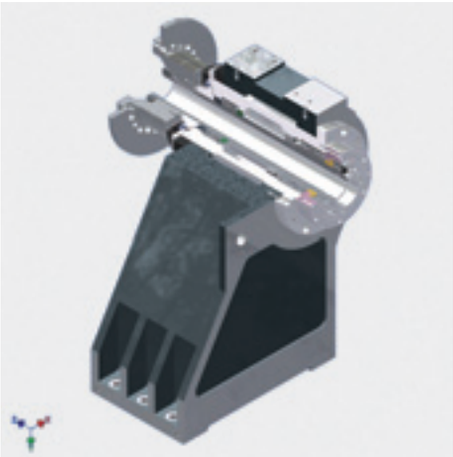
Y-axis Travel
±55mm

Z-axis Travel
560mm
※FNL-220LSY / FNL-220LY

350mm
※FNL-220Y

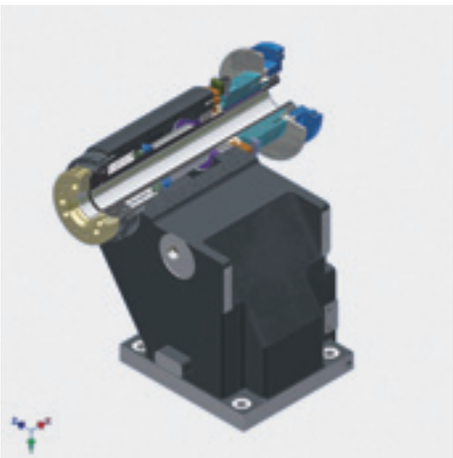
	Ø A Max. Cutting Diameter(mm/inch)	ØB Max. Cutting Length(mm/inch)	C1,C2 Travel(degree)
FNL-220LSY	270 (10.6)	510 (20.1)	360
FNL-220LY	270 (10.6)	510 (20.1)	360
FNL-220Y	270 (10.6)	300 (11.8)	360

Spindle And Sub-Spindle



Main Spindle (Belt)

- High-Precision Spindle
- 20HP, Fanuc AC digital spindle motor with dual winding motor.

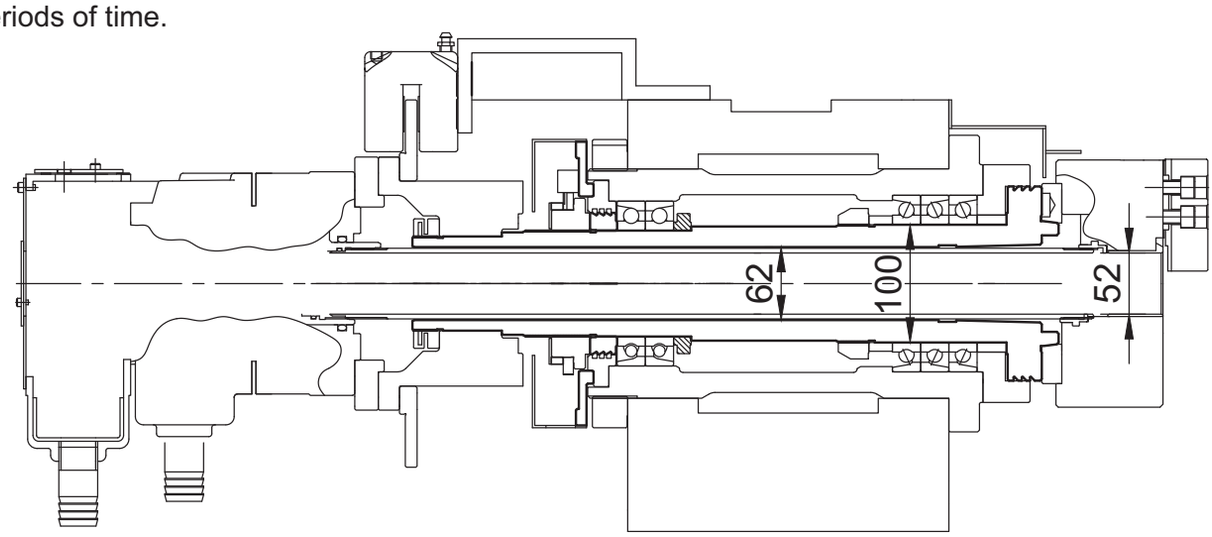


Sub-Spindle

- Both the main spindle and sub-spindles provide positioning resolution up to 0.015 degree to accomplish three dimensional contouring.
- Exact synchronization between the main spindle and sub spindle at any rotation speed can be programmed to perform part transfer for secondary machining to enhance production efficiency and reduces idle time.

Spindle Hole Capacity

- High-speed, high-precision spindle combines front angular ball bearing and rear single row roller bearing to ensure optimum, running and cutting precision even during extended periods of time.
- 8" spindle designed with spindle bore of 62mm and accepts bar stock to 52mm diameter. Option spindle bore 77mm, bar capacity 65mm diameter.

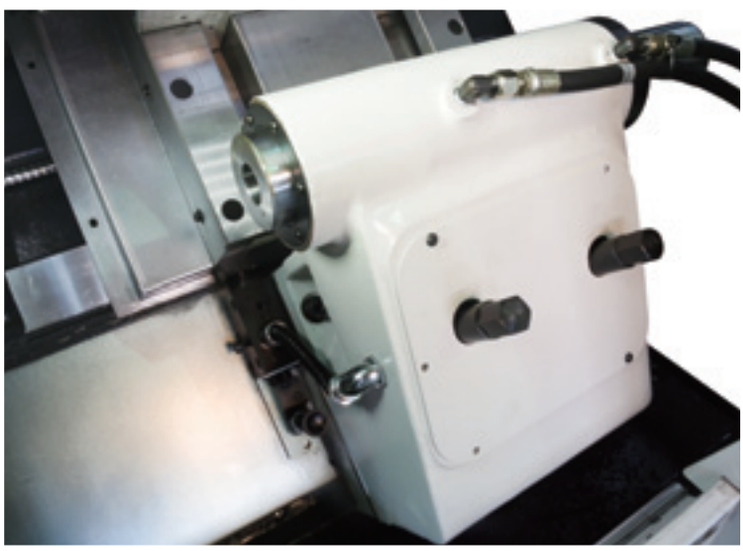


Tailstock

Programmable Tailstock Interface

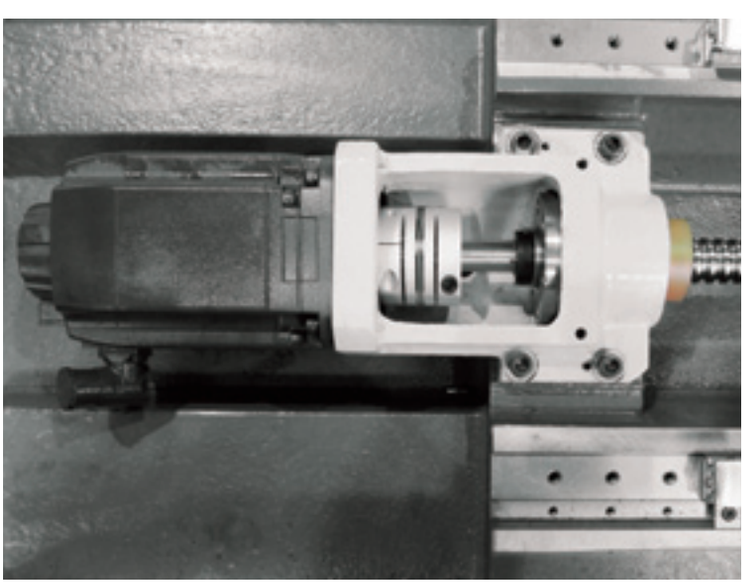
- Highly rigid machine body results in shock-dampening properties.
- Programmable Z-axis saddle control for automatic tailstock movement.

Tailstock specification		
Tailstock travel	mm	560
Tailstock quill diameter	mm	85
Taper hole of tailstock quill		MT5
Tailstock quill travel	mm	100



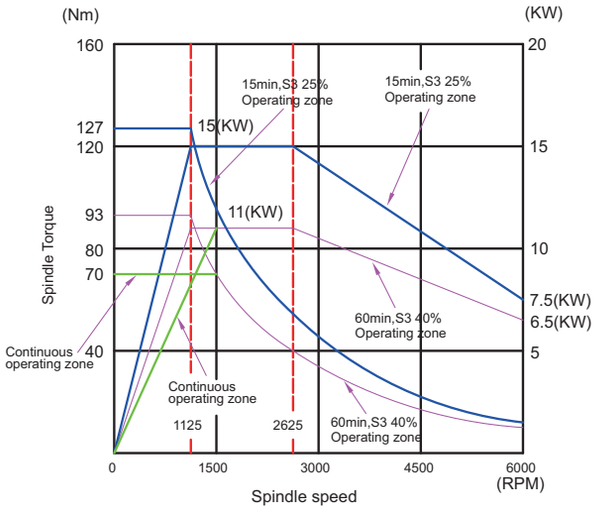
Axis Drive and Ball Screw

- All axes are powered by an AC servo motor.
- High-torque drive motors are connected to all ball screws for quiet and responsive slide movement for no backlash.
- Double pretensioned ball screws on X-axis are supported on each end by Class P4 angular contact thrust bearings.
- Both axes are driven by large diameter, high-precision ball screws. All ball screws are fully supported on both ends.

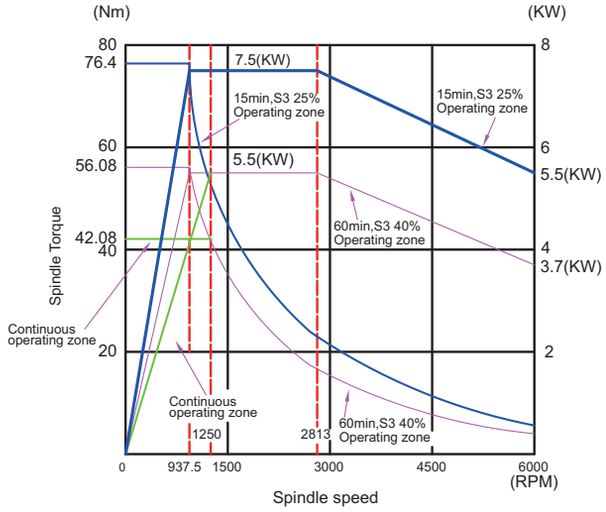


Spindle And Sub-Spindle

Spindle Power-Torque Diagram



Sub Spindle Power-Torque Diagram

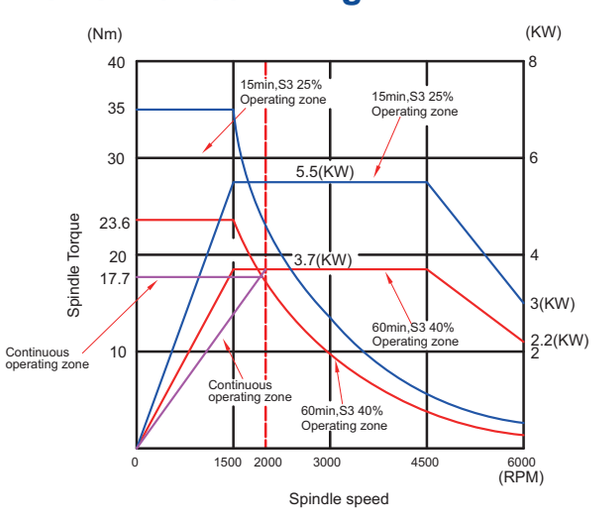


Turret And Diagrams

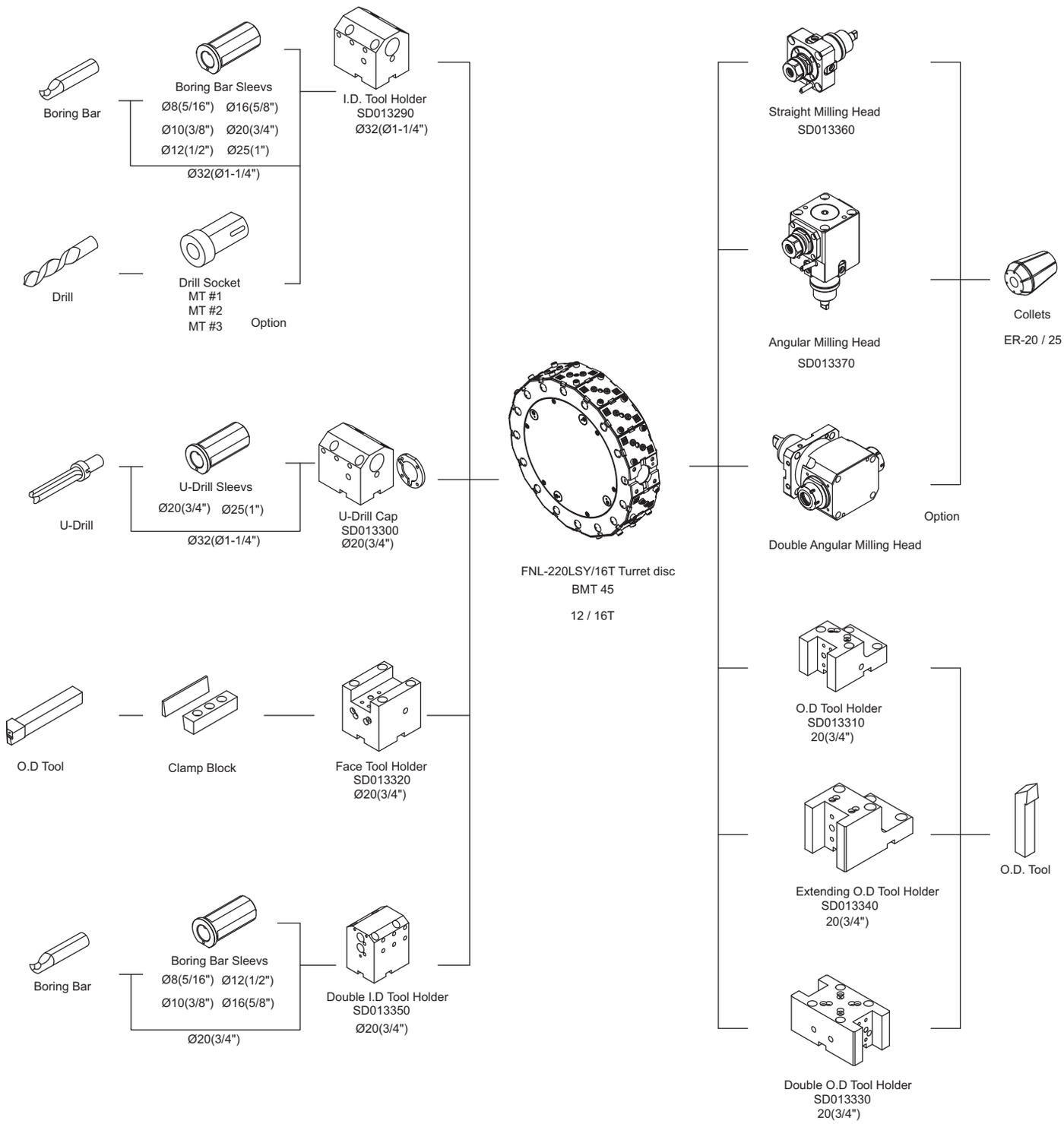
Powerful 12/16 Station, BMT45P Servo Driven Turret

- Fitted with powerful servo indexing turret for heavy-duty machining. Structured with rigid mechanical parts to meet strict requirements for machining efficiency.
- All stations are live, max. 6,000rpm live tool speed. The fast servo index turret can reach 0.15 sec in T-T.
- Driven by a big power 3.7/5.5Kw, providing ultra high power to meet any difficult milling task, drilling and tapping application.
- Machine includes a heavy-duty Hirth coupling that feature a positive from-locking, self-centering, accurate repetition connection.

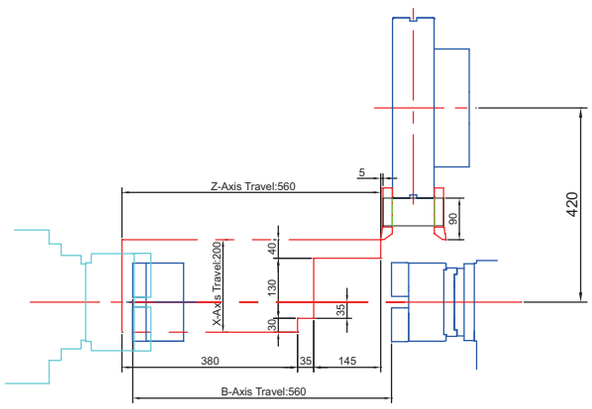
Power Turret Milling

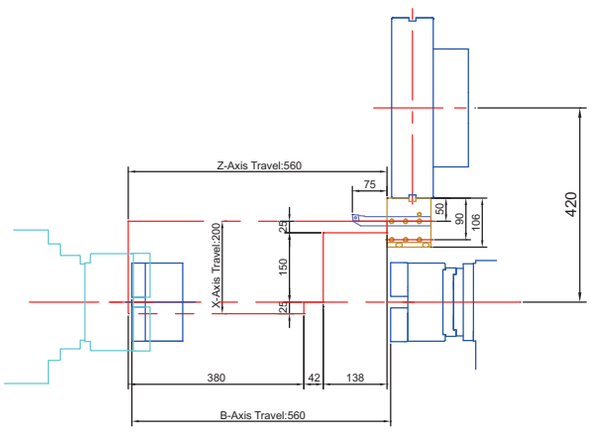


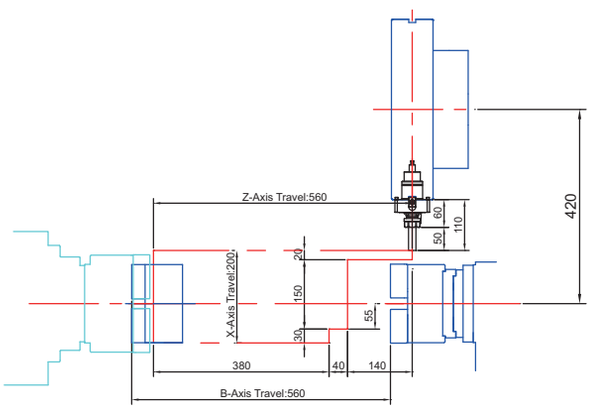
Tool System Diagram

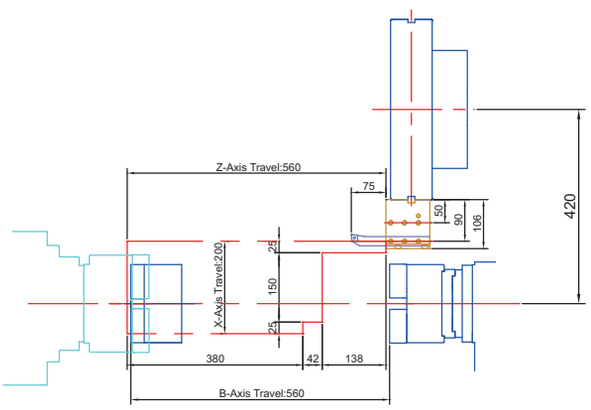


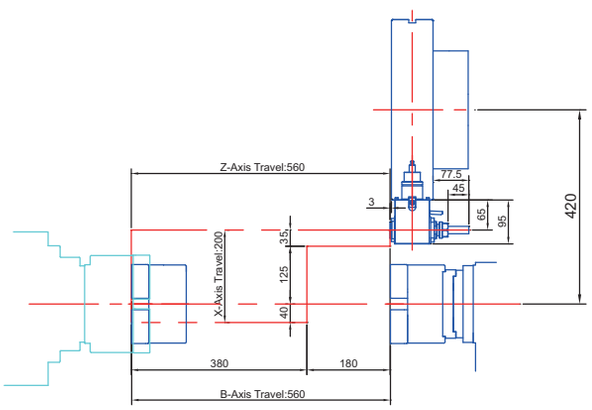
Machining Zone

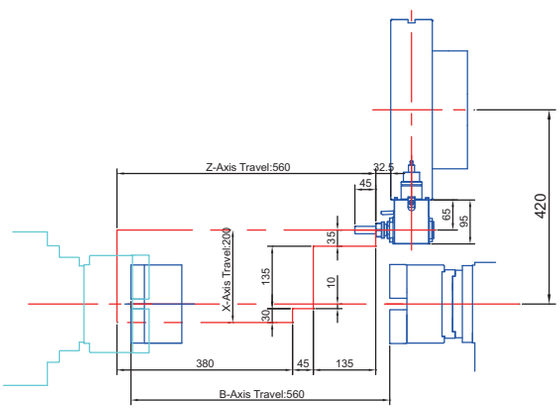


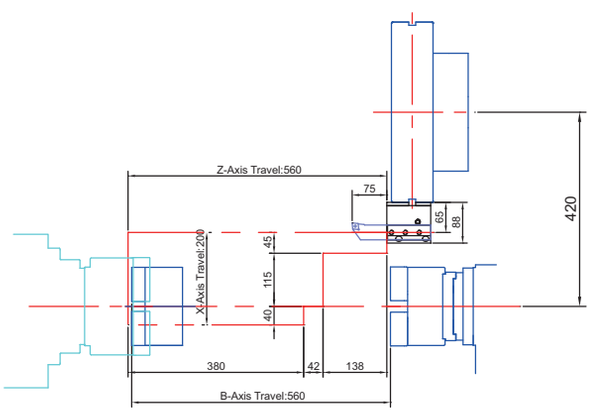


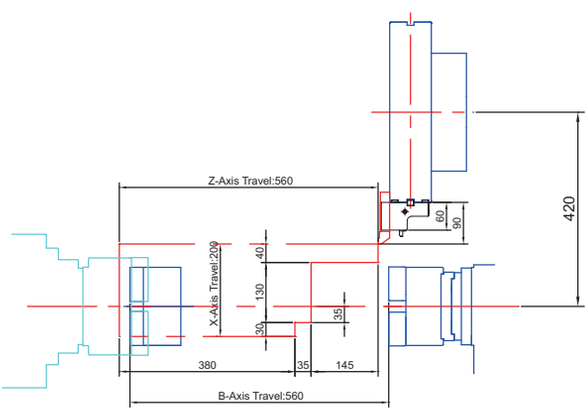






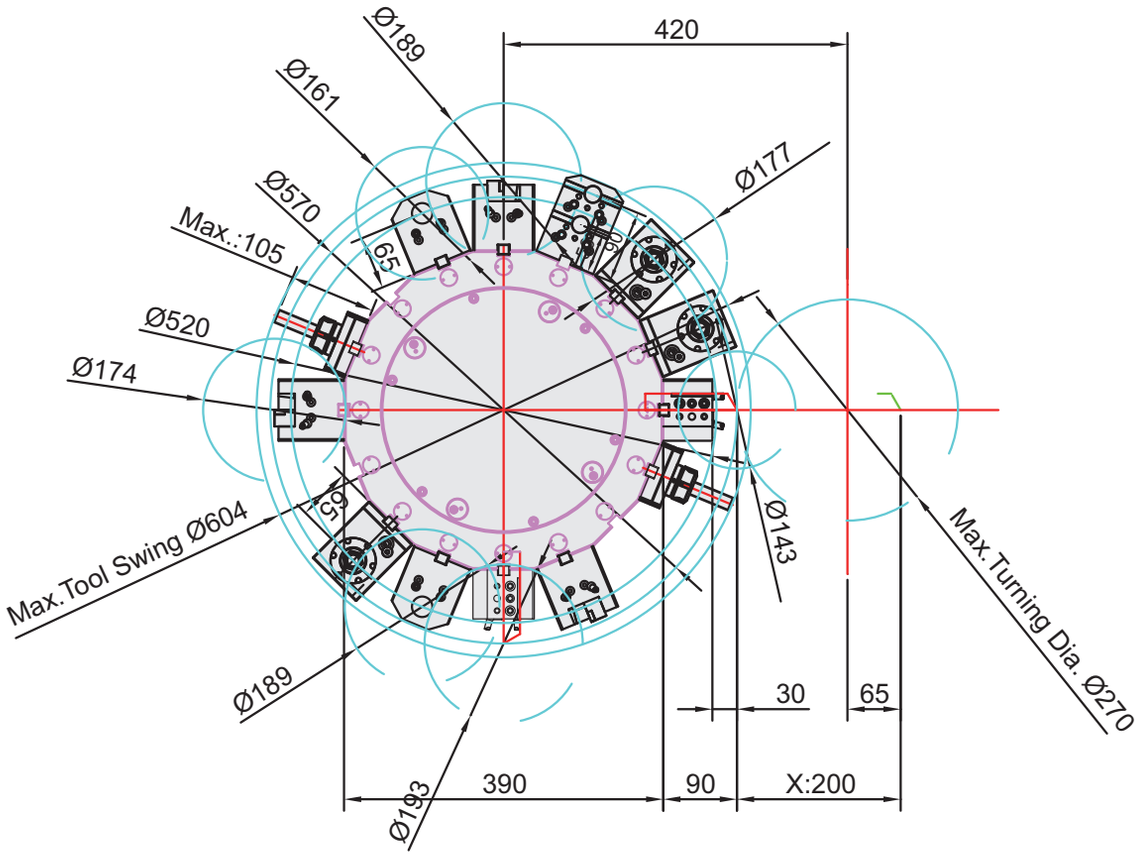






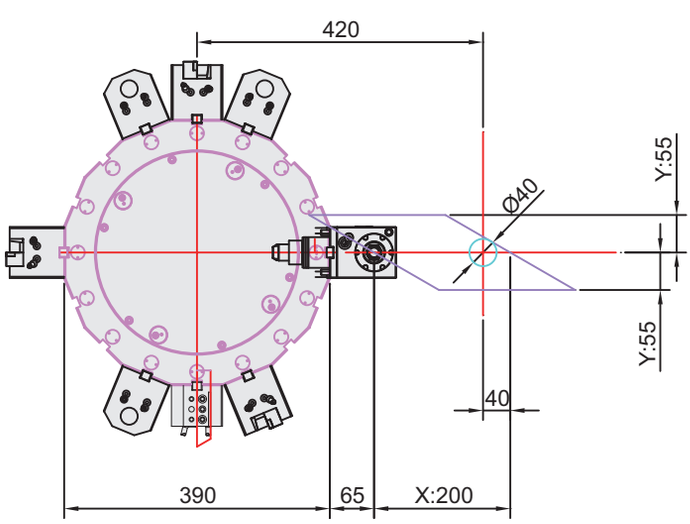
Tool Interference

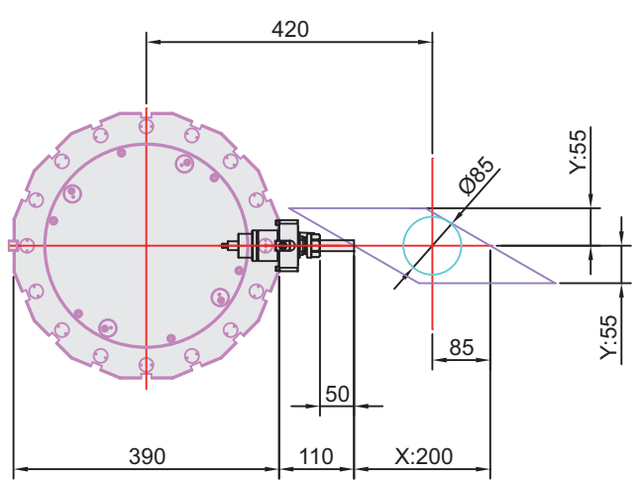
Unit:mm



Y-axis Milling Area

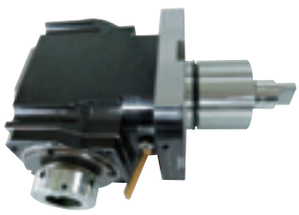
Unit:mm





Optional Power Tool Holders

Radial Power Tool Holder
ER25
6000rpm max turning speed

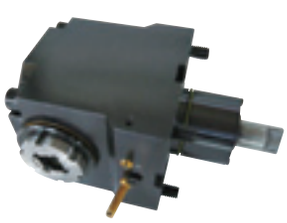


Axial Power Tool Holder
ER25
6000rpm max turning speed

Radial Face Milling Tool Holder
Tool Clamping
6000rpm max turning speed

Axial Face Milling Tool Holder
Tool Clamping

High Speed Radial Power Tool Holder
ER25
12000rpm max turning speed

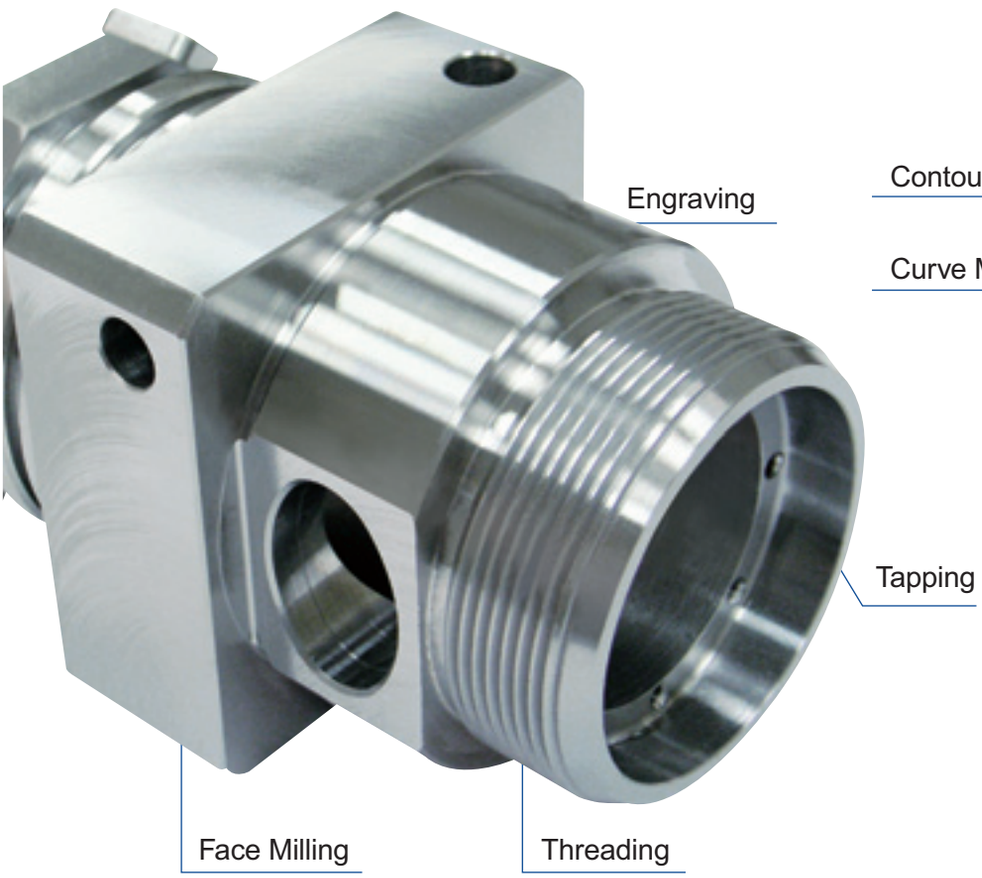


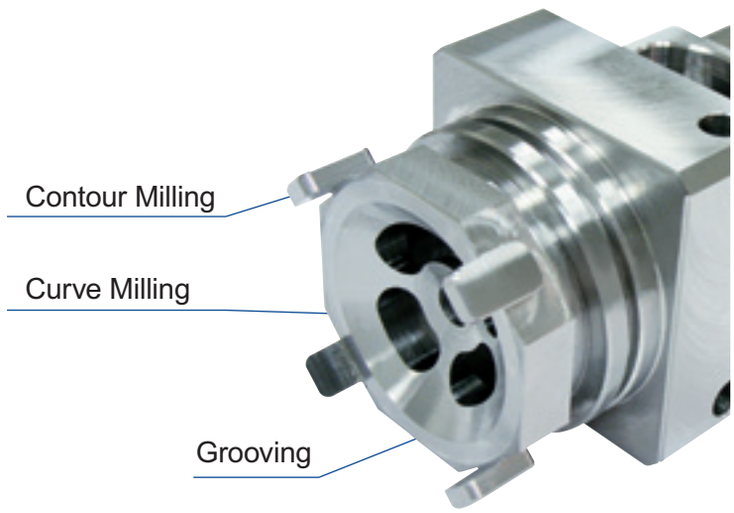
High Speed Axial Power Tool Holder
ER25
12000rpm max turning speed

Axial Two Head Power Tool Holder
6000rpm max speed

Live tool turret motor offers
3.7 / 5.5Kw 35Nm
for high torque output, with
speed up to 6000rpm.

Workpieces





Automobile Parts
Aluminum Alloy

Motorcycle Parts
Aluminum Alloy

Power Tool Parts
S45C Medium Carbon Steel

Machine Parts
S45C Medium Carbon Steel

Motor Casting
Aluminum Alloy

Hydraulic Parts
Stainless Steel

Fitness Equipment Parts
Aluminum Alloy

Automation For Productivity

Automation maximizes business productivity and increase production and efficiency in various operations. The process speeds up production and lead time is reduced. The FNL series is the best machine in the market with the ability to turn and mill complex parts and perform multiple operations on one machine, which increases throughput and reduces handling. This is just another example of how Chevalier can adapt automation to existing machine tools to boost productivity. Let us show you how automation
can work for you.

Specifications

Description			Unit	FNL-220Y	FNL-220LY	FNL-220LSY
Capacity	Swing over bed		mm (inch)	620(24.4)		
	Swing over saddle		mm (inch)	620(24.4)		
	Max. Turning diameter		mm (inch)	270(10.6)		
	Max. Turning length		mm (inch)	300(11.8)	510(20.1)	
	Chuck size inch		inch	8		
	Bar working diameter		mm (inch)	52(2)/65(2.6)		
Travels	Travel distance	X-axis	mm (inch)	200(7.9)		
		Z-axis	mm (inch)	350(13.8)	560(22.0)	
		Y-axis	mm (inch)	110(+55,-55) / 4.3(+2.2,-2.2)		
		B-axis	mm (inch)	—		560(22.0)
		C1, C2-axis	mm (inch)	360		
Feedrate	Rapid Traverse Rate	X-axis	m/min(ipm)	30(1181.1)		
		Z-axis	m/min(ipm)	30(1181.1)		
		Y-axis	m/min(ipm)	10(393.7)		
		B-axis	m/min(ipm)	—		20(787.4)
		C-axis	RPM	200		
Main spindle	Max. Spindle speed		r/min	4500		
	Spindle nose		ASA	A2-6		
	Spindle bearing diameter (Front)		mm (inch)	100(3.9)/110(4.3)		
	Spindle through hole		mm (inch)	62(2.4)/77(3.0)		
	Min. spindle Indexing angle (C-axis)		deg	0.001		
Turret	No. of tool stations		ea	12 / 16		
	Turret type			BMT 45		
	OD tool size		mm (inch)	20x20(0.8x0.8)		
	Max. boring bar size		mm (inch)	32(1.25)		
	Turret Indexing time(1 station swivel)		sec	0.28 sec. 30 degrees (Single step)		
	Max. Rotary tool speed		r/min	6000(Fanuc)/4500(SIEMENS)		
Tail Stock	Quill diameter		mm (inch)	85(3.35)		—
	Quill bore taper		MT	#5		—
	Quill travel		mm (inch)	100(3.94)		—
	Tail stock base travel		mm (inch)	350(13.8)	560(22.0)	—
Sub spindle	Spindle speed		r/min	—		6000
	Spindle nose		FLAT	—		ϕ 140
	Spindle bearing diameter (Front)		mm (inch)	—		80(3.15)
	Spindle through hole		mm (inch)	—		56(2.2)
	Bar working diameter		mm (inch)	—		45(1.77)
	Min. spindle Indexing angle (C-axis)		deg	—		0.001
Motors	Main spindle motor power(cont./30min)		KW(Hp)	(β12) 11/15(15/20.4)		
	Sub spindle motor power		KW(Hp)	—		(β6) 5.5/7.5(7.5/10)
	Rotary tool motor power		KW(Hp)	(β3) 3.7/5.5(5/7.5)		
	Coolant pump motor power		KW(Hp)	1.17(1.59)		
Coolant tank capacity			/	250		
Power source	Electric power supply(rated capacity)		kVA	30		
Machine Dimensions	Height		mm (inch)	2122(83.5)	2122(83.5)	2122(83.5)
	Width		mm (inch)	2946(110)	2946(110)	2946(110)
	Depth		mm (inch)	1954(77)	1954(77)	1954(77)
	Weight		kg(lb)			
NC CONTROL				Fanuc 0i series / Siemens 828D		

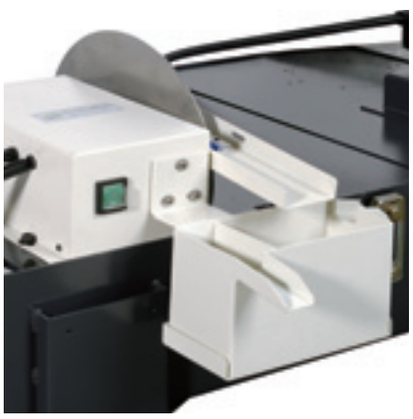
All content is for reference only and may be subject to change without notice or obligation.

Standard/Optional Accessories

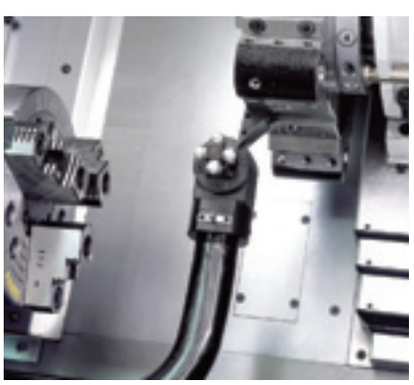
Discription	FNL-220Y	FNL-220LY	FNL-220LSY
8" Hydraulic Chuck	●	●	●
6" Hydraulic Chuck (Sub-spindle)	—	—	●
Hard Jaws (Set)	8"x1	8"x1	8"x1
Soft Jaws (Set)	8"x1	8"x1	8"x1
Boring Bar Holder	3	3	3
Bi-drectional Boring Bar Holder	—	—	—
Face Holder	1	1	1
O.D. Tool Holder	3	3	3
Extended O.D. Tool Holder	1	1	1
Radial Power Tooling Holder	◊	◊	◊
Axial Power Tooling Holder	◊	◊	◊
Tool Sleeve Ø8~25 (Set)	1	1	1
Coolant System	●	●	●
Movable Coolant Tank	●	●	●
1 Set Leveling Bolts And Pads	●	●	●
Grease Lubrication System	●	●	●
Centralizing Lubrication System	◊	◊	◊
Work Lamp	●	●	●
3 Color Light	●	●	●
Foot Pedal For Hydraulic Chuck	●	●	●
Tool Kit	●	●	●
Hand Wheel	●	●	●
Chip Conveyor And Bucket	●	●	●
High Presure Pump 10 Bar	●	●	●
MT5 Live Center	●	●	—
Programmable Tailstock	●	●	●
Parts Catcher (Main Spindle)	◊	◊	◊
Parts Catcher (Sub-Spindle)	—	—	◊
Manual Tool Setting Probe (Main Spindle)	◊	◊	◊
Manual Tool Setting Probe (Sub-Spindle)	—	—	◊
Auto. Tool Setting Probe (Main Spindle)	◊	◊	◊
Oil Skimmer	◊	◊	◊
Oil Mist Collector	◊	◊	◊
Transformer	◊	◊	◊
CE Safety Accessories	◊	◊	◊
Manual Guide i (Fanuc)	◊	◊	◊
Shop Turn (Seimens)	◊	◊	◊
Auto. Door (Pneumatically Driven)	◊	◊	◊
Pedal Switch For Tailstock	◊	◊	—
Bar Feeder And Interface	◊	◊	◊
Collet Chuck	◊	◊	◊

● Standard Accessories, ◊ Optional Accessories

Standard Coolant System With Tank



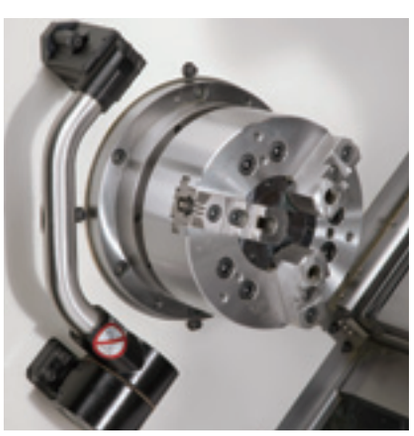
Auto. Lubrication System WIth PressureDetection Sensor



Optional Manual Tool Setter

Optional Bar Holder

Optional Parts Catcher



Optional 10" Chuck Upgrade

福碩科技實業股份有限公司 FOCUS CNC CO., LTD.
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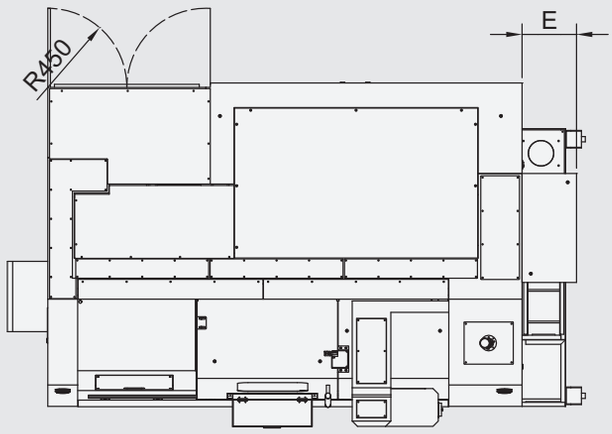
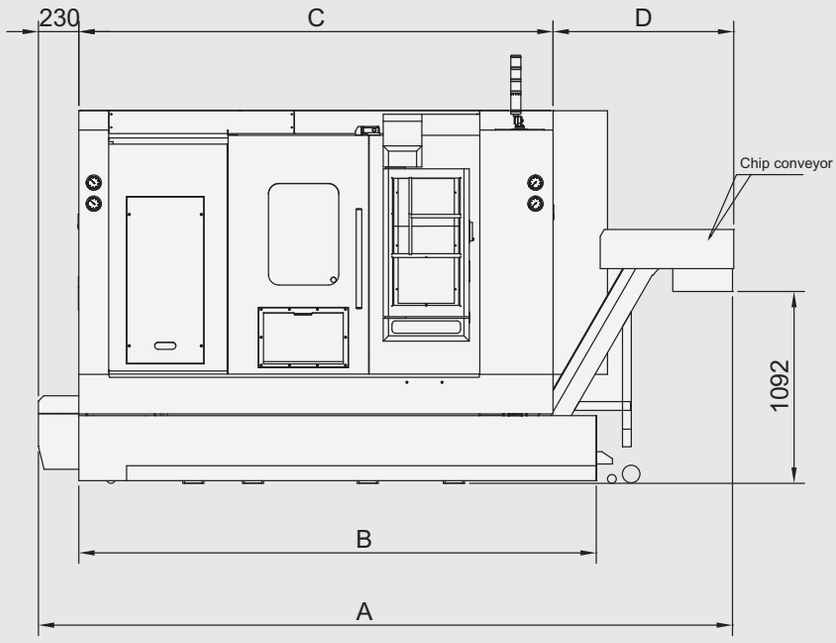
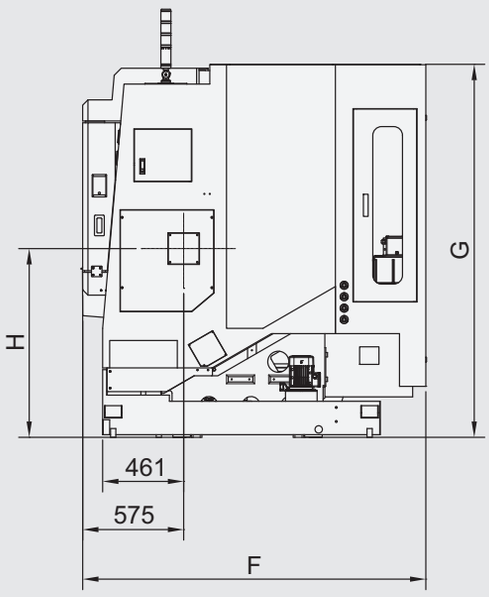
TEL: 886-4-2560-6067 FAX: 886-4-2567-7938 E-mail:focus@focuscnc.com.tw

RICH WELL 2016.10

Dimensions







Unit:mm	A	B	C	D	E	F	G	H
FNL220LSY/FNL220LY	3952	2946	2700	1029	310	1954	2122	1074