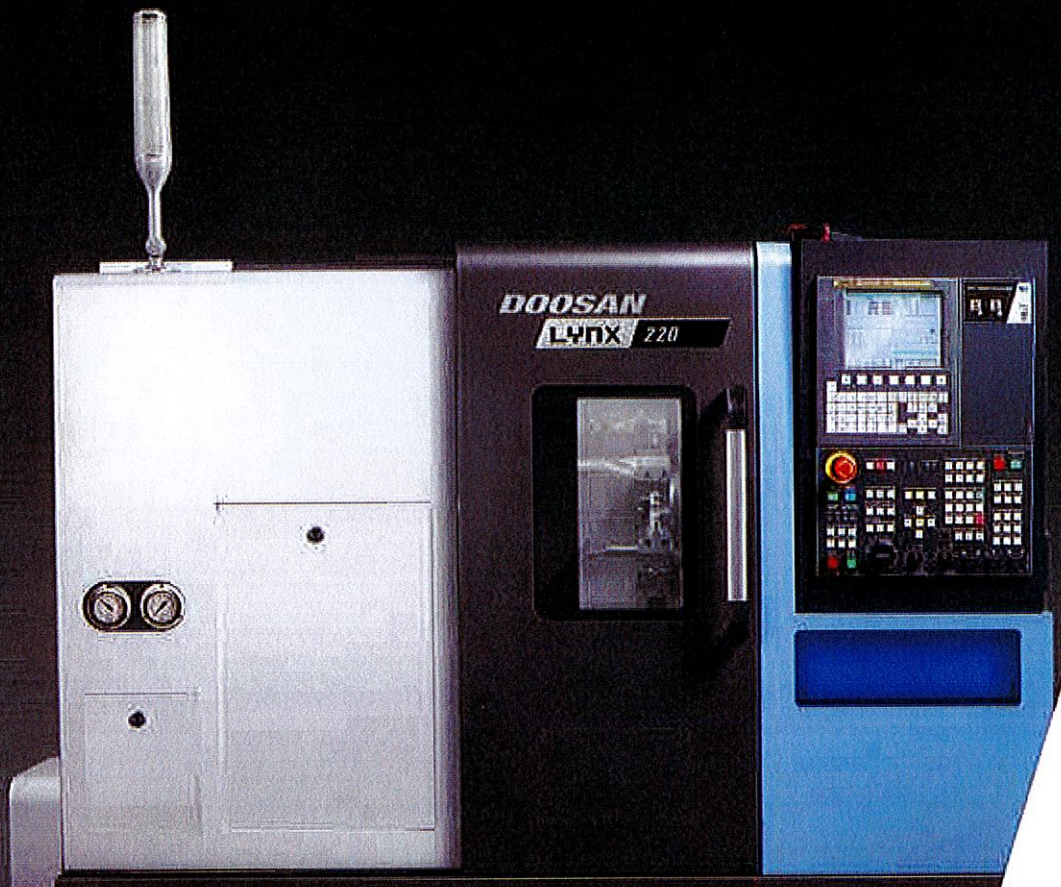
DOOSAN

Optimal Solutions for the Future

Lynx 220 series



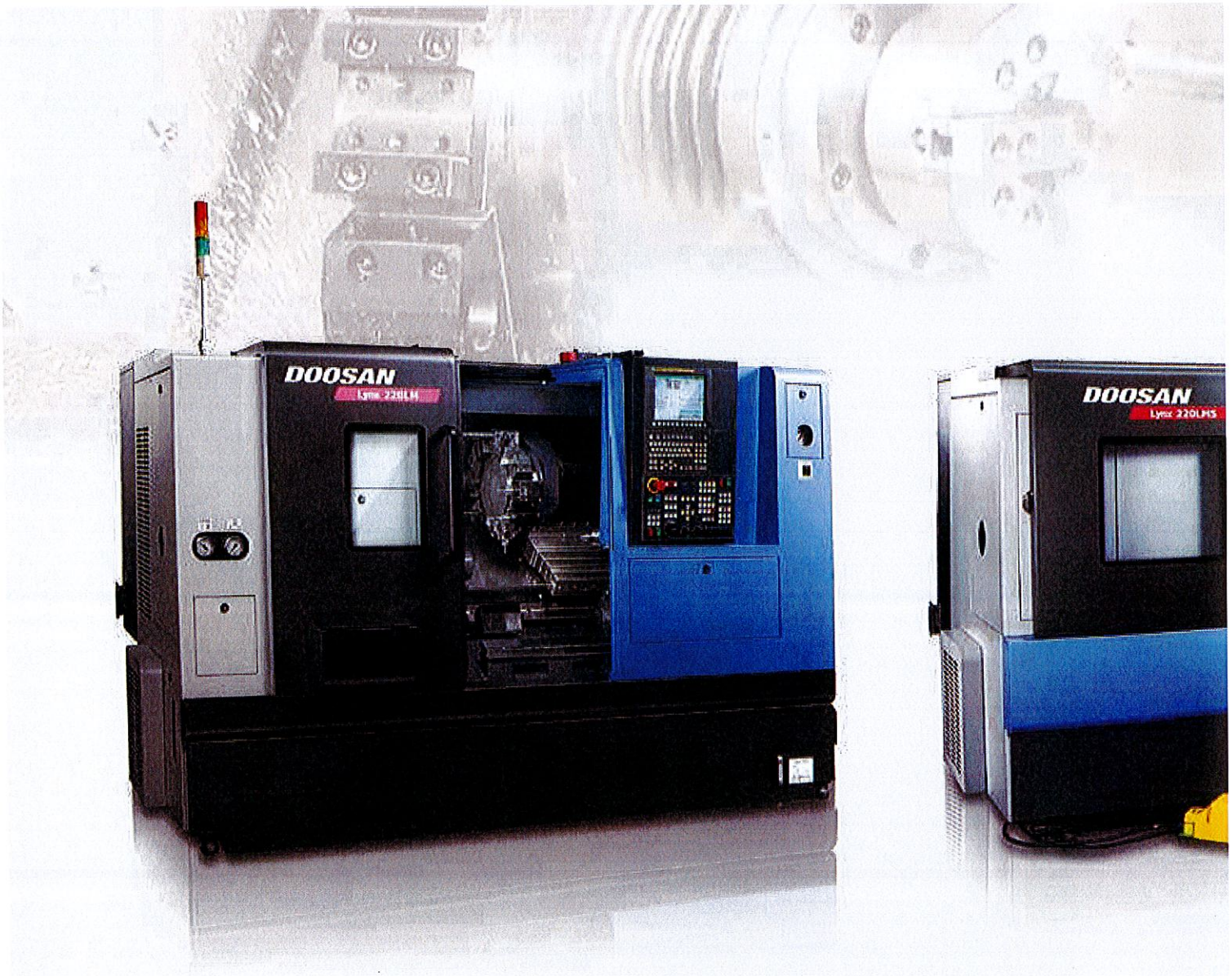
High Productivity Turning Center

Lynx 220 series

Lynx 220A/LA/B/LB
Lynx 220C/LC/MA/LMA
Lynx 220MC/LMC
Lynx 220LMSA/LMSC

ver. EN 160816 SU

Lynx 220 series

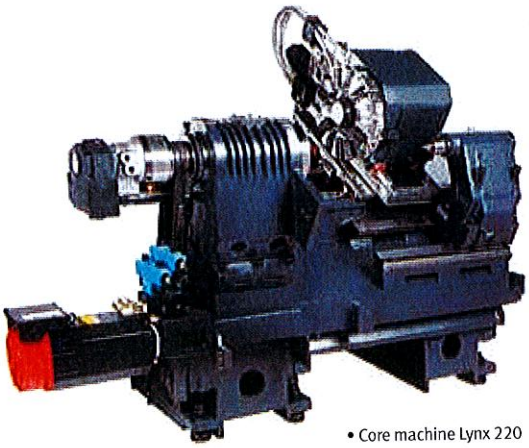


High Productivity Turning Center

The Lynx 220 series is a accurate, high productivity turning center designed with ultra fast rapids and high-speed turret indexing providing greater value and cost performance.

High Speed

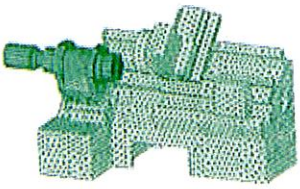
Structure



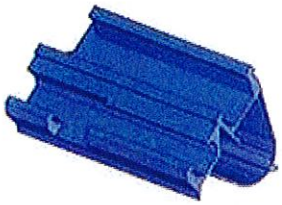
• Core machine Lynx 220

Max. turning dia. X length

Lynx 220A [LA]	ø 320 x 322 [542] mm (ø 12.6 x 12.7 [21.3] inch)
Lynx 220B [LB] / 220C [LC]	ø 320 x 305 [525] mm (ø 12.6 x 12.0 [20.7] inch)
Lynx 220M [LM]	ø 250 x 290 [510] mm (ø 9.8 x 11.4 [20.1] inch)
Lynx 220LMSA / LMSC	ø 300 x 510 mm (ø 11.8 x 20.1 inch)

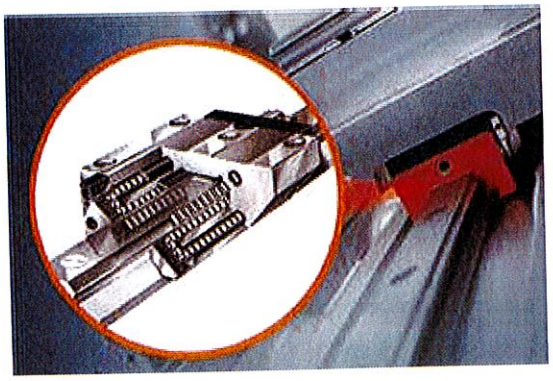


FEM analysis used to design a stable body. (FEM : Finite Element Method)



The heavily ribbed torque tube design prevents twisting and deformation. All guideways are wide wrap-around rectangular type for unsurpassed long-term rigidity and accuracy.

Rapid Traverse

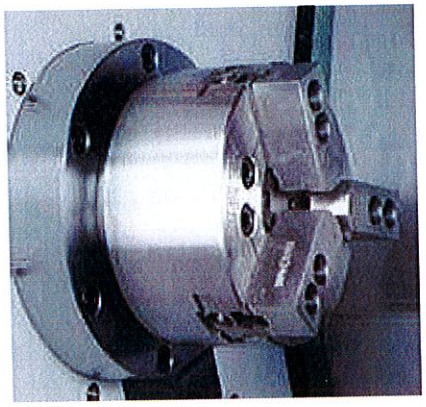


Roller-type LM Guide is mounted on the machine to improve rigidity and feedrates. Each axis is powered by a maintenance free digital AC servo motor. These high torque drive motors are connected to the ball screws without intermediate gears for quiet and responsive slide movement with virtually no backlash.

	X-axis	Z-axis	B-axis
Lynx 220 / M	30 m/min (1181 ipm)	36 m/min (1417 ipm)	-
Lynx 220LMS			30 m/min (1181 ipm)

Main Spindle

The C-axis is positioned in degree increments of 0.001. Through spindle synchronization with the X and Z axes, three dimensional contouring, complex and prismatic machining can be accomplished.



Max. spindle speed

Lynx 220A / B / C
6000 / 5000 / 4000 r/min

Lynx 220MA / C
6000 / 4500 r/min

Lynx 220LMSA / C
6000 / 4500 r/min

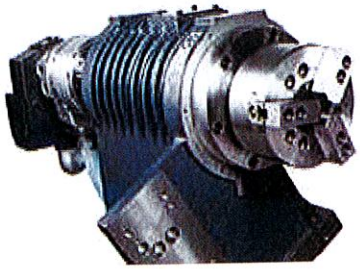
Max. bar working dia.

Lynx 220A / B / C
ø 45 / 51 / 65 mm
(ø 1.8 / 2.0 / 2.6 inch)

Lynx 220MA / C
ø 51 / 65 mm
(ø 2.0 / 2.6 inch) [Main / Sub]

Lynx 220LMSA / C
ø 51 / 65 mm
(ø 2.0 / 2.6 inch) [Main / Sub]

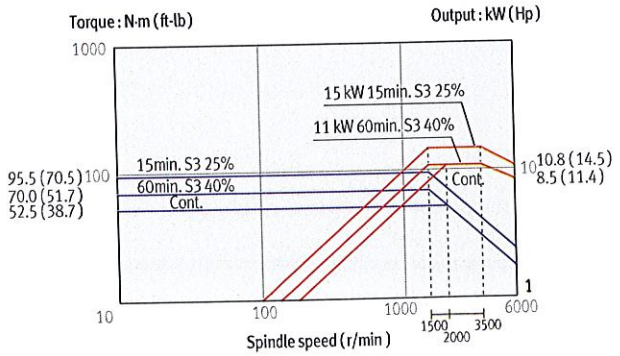
Headstock and spindle



The headstock and main spindle are manufactured in a temperature controlled environment then assembled and tested in our clean room. The heavy duty cartridge type spindle is supported by a triple row angular ball bearing in the front, with a row cylindrical roller bearing in the rear. This combination of bearings is very effective in refraining from thermal displacement of its front nose and improving high speed performance and its rotational precision.

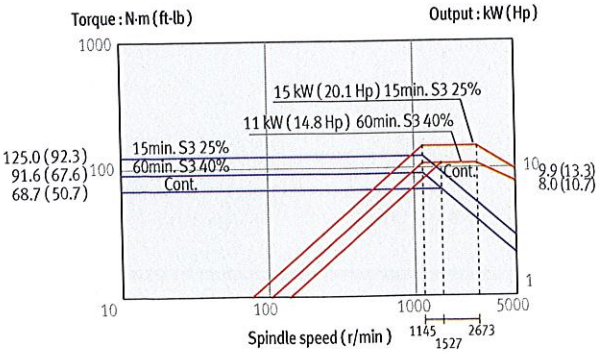
Main Spindle Power-torque Diagram

Lynx 220A / LA



6000 r/min, 15 / 11 kW (20.1 / 14.8 Hp)

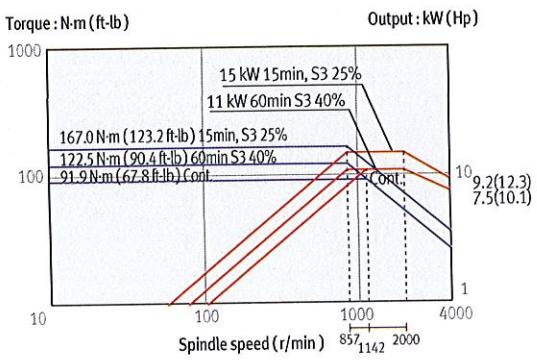
Lynx 220B / LB



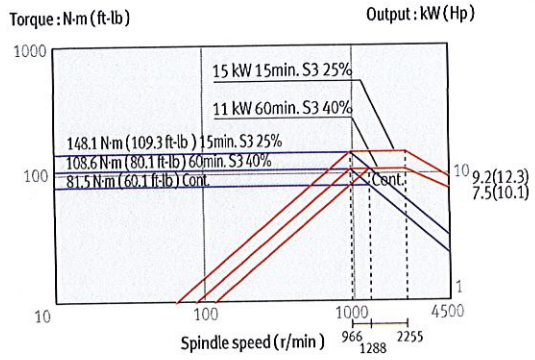
5000 r/min, 15 / 11 kW (20.1 / 14.8 Hp)

Main Spindle Power-torque Diagram

Lynx 220C / LC

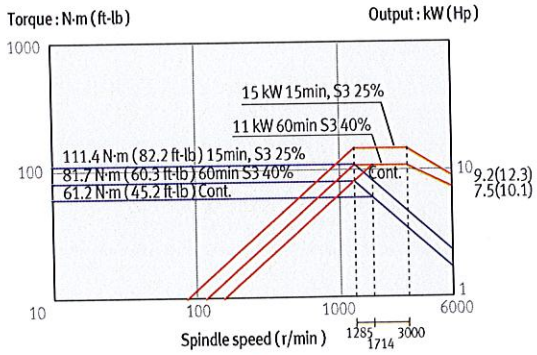


4000 r/min, **15 / 11** kW (20.1 / 14.8 Hp)



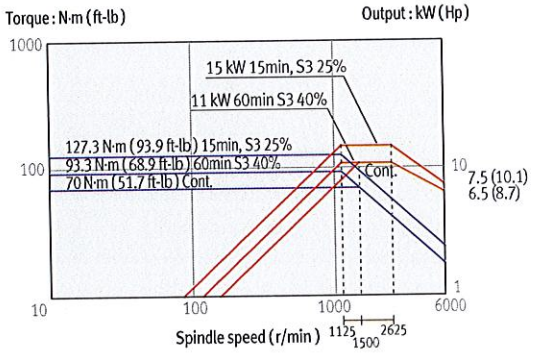
4500 r/min, **15 / 11** kW (20.1 / 14.8 Hp) opt.

Lynx 220MA / LMA



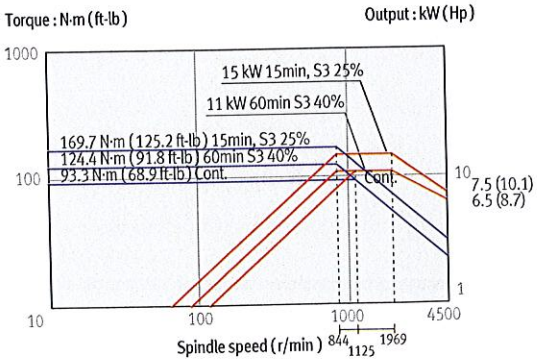
6000 r/min, **15 / 11** kW (20.1 / 14.8 Hp)

Lynx 220LMSA



6000 r/min, **15 / 11** kW (20.1 / 14.8 Hp)

Lynx 220MC / LMC / LMSC

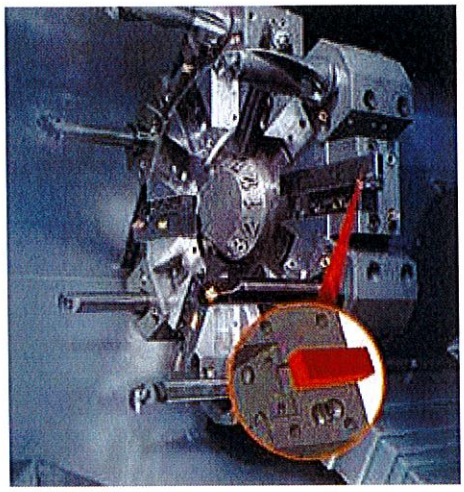


4500 r/min, **15 / 11** kW (20.1 / 14.8 Hp)

High Productivity

2 axis Servo Turret (A / B / C)

Rigidity and efficiency provide increased machine performance.



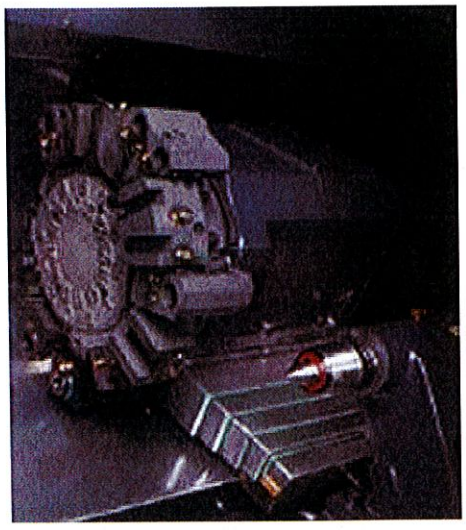
heavy duty turret features a large 210mm diameter curvic coupling and 39 kN of hydraulic clamp force. The heavy duty design provides unsurpassed rigidity for heavy stock removal, fine surface finishes, long boring bar overhang ratios, and extended tool life.
All turret rotations are controlled by high torque servo motor and turret indexing is non-stop-bi-directional, with a 0.11 second station to station index time.

Index time (1-station index)
0.11 s

No. of tool stations
12 ea

BMT Turret (MA / MC / LMA / LMC / LMSA / LMSC)

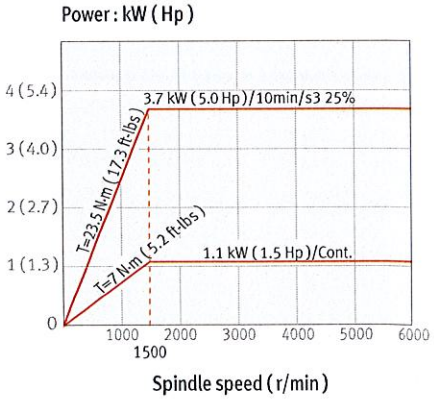
BMT turret makes it possible to complete complicated parts requiring many tools in just one set-up. Reliable servo driven turret reduces the total cycle time required to machine parts.



Index time (1-station index)
0.11s

No. of tool stations
Lynx 220MA / MC / LMA / LMC / LMSA / LMSC
12 ea (24 position index)

Rotary tool spindle power -torque diagram



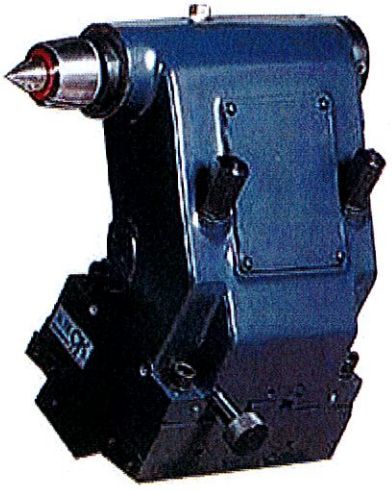
Lynx 220M / LM / LMS (BMT45P)

Tailstock

Widely spaced guideways and heavy-duty design of the tailstock body ensure ample rigidity. The tailstock body is positioned by traction bar, which engages with the carriage. The traction bar movement and hydraulic body clamping are manual.

{ } : option

Tailstock specification		Lynx 220ser
Tailstock travel	mm (inch)	550 (21.7), {330 (13.0)}
Tailstock quill diameter	mm (inch)	65 (2.6)
Taper hole of tailstock quill		MT4 ‹Live center›
Tailstock quill travel	mm (inch)	80 (3.1)



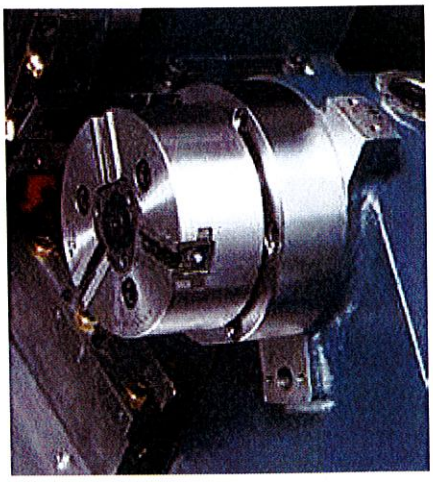
Note) Tail Stock

- std. Lynx 220LA / LB / LC / LMA / LMC
- opt. Lynx 220A / B / C
- N.A Lynx 220MA / MC / LMS

- std. Standard
- opt. Optional
- N.A Not Available

Sub Spindle (LMSA / LMSC)

The travel time of the workpiece is minimized, because the travel of workpiece between both spindles is carried out under a state of revolution through the synchronized control of revolution speed, In addition, the cutting performance is enhanced because the cross-sectional adhesion of the workpiece at the axis of the servo spindle is secured by the use of a torque skip function when travelling to the B axis.



Max. spindle speed

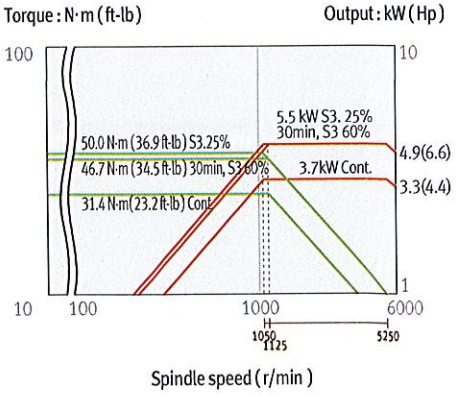
6000 r/min

C1, C2-axis index

360°

(in 0.001 increment)

Sub-spindle power -torque diagram



6000 r/min, **5.5 / 3.7** kW (7.4 / 5.0 Hp)

Operation Convenience

Doosan's New Operation Panel

New Doosan operation panel designed ergonomically and 10.4" color* LCD provide convenient operation for operators

1. 10.4" color* LCD : Easy to control and programming
2. Unique operator panel of Doosan Infracore designed with membrane switches
3. New operator panel for all the models with enhanced accessibility
4. User configurable, detachable buttons to set up customized options

❶ **Doosan-Fanuc i series**

❷ **10.4" color* TFT LCD monitor**
Large 10.4" LCD screen showing error messages of the machine and controller improves operator's work convenience.

❸ **PCMCIA Card**

❹ **USB Port**

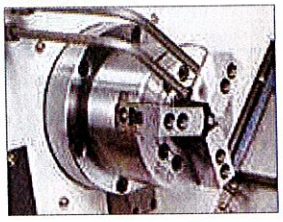
❺ **Ethernet Connectivity (embedded)**

❻ **Swing-type Panel**
The operation panel can swing up to 88° to provide the operator with convenience during work.

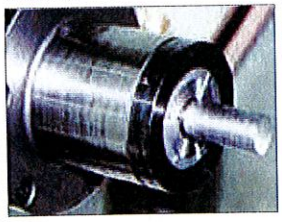
* 10.4" color LCD : it can be an optional feature for parts of models

Optional Equipment

Chuck air (or coolant) blower

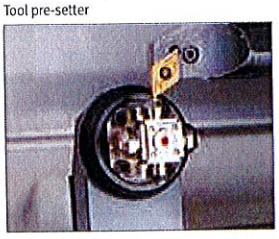


Collet chuck



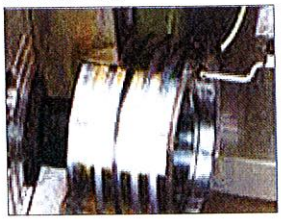
Chip conveyor

Tool pre-setter

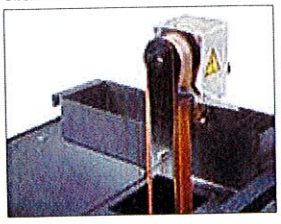


Signal tower

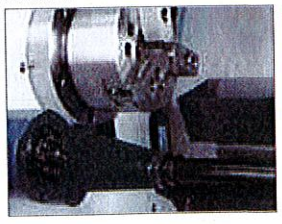
Work measurement



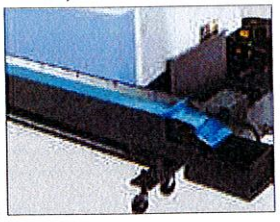
Oil skimmer



Part catcher



Part conveyor



High Performance & Accuracy

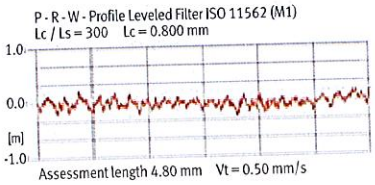
More powerful revolving motor is adapted to improve the productivity.

Accuracy

Doosan offers its customers unsurpassed levels of accuracy by applying the latest design techniques and rigorous testing processes.

Roughness

0.07 µm (Ra)

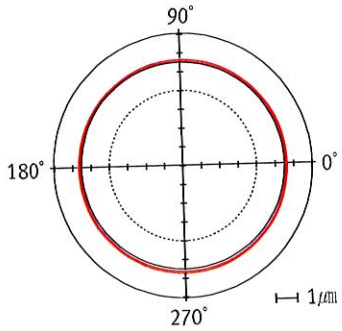


Material		Brass
Cutting Feed	mm/rev (ipr)	0.025 mm/rev
Cutting Depth	mm (inch)	0.025 mm
Cutting Speed	m/mm (ipm)	300 m/min (11811.0 ipm)
Tool		Diamond (Nose R0.1)

※ This is actual cutting result. It might be not available under certain circumstances

Roundness

0.3µm

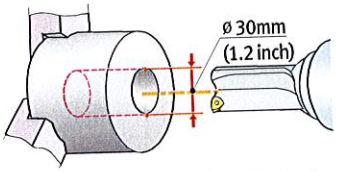


Machine Capacity

Heavy duty cutting

Making full use of the high output motor, heavy-duty O.D. cutting is powerful and precise even with large workpieces.

Center drilling



Chip removal rate
320 cm³/min (19.5 m³/inch)

Cutting depth
4 mm (0.16 inch)

Carbon steel, SM45C

Cutting speed
200 m/min (7874.0 ipm)

Feedrate
0.4 mm/rev (0.0 ipr)

Chip removal rate
168 cm³/min (10.25 m³/inch)

Carbon steel, SM45C

Cutting speed
80 m/min (3149 ipm)

Feedrate
0.28 mm/rev (0.011 ipr)

Productivity

Machining times can be reduced.

- Productivity gains can be achieved through Lynx series.

Material : Carbon steel, SM45C
Size : ø 62 x 66mm
(ø2.4 x 2.6 inch)

Process	Cutting time s	Cutting speed m/min (ipm)	Feed rate m/rev
U-drilling (ø30 mm)	18.1	120 (4724.4)	0.2
O.D. cutting (Rough)	9.2	200 (7874.0)	0.45
O.D. cutting (Finish)	18.2	250 (9842.5)	0.2
O.D. grooving1 (4 mm)	3.5	140 (5511.8)	0.2
O.D. grooving2 (8 mm)	5.8	140 (5511.8)	0.17
O.D. threading (M45 x P1.5)	10.4	201 (7913.4)	1.5
Cut-off cutting (4 mm)	15.1	120 (4724.4)	0.1

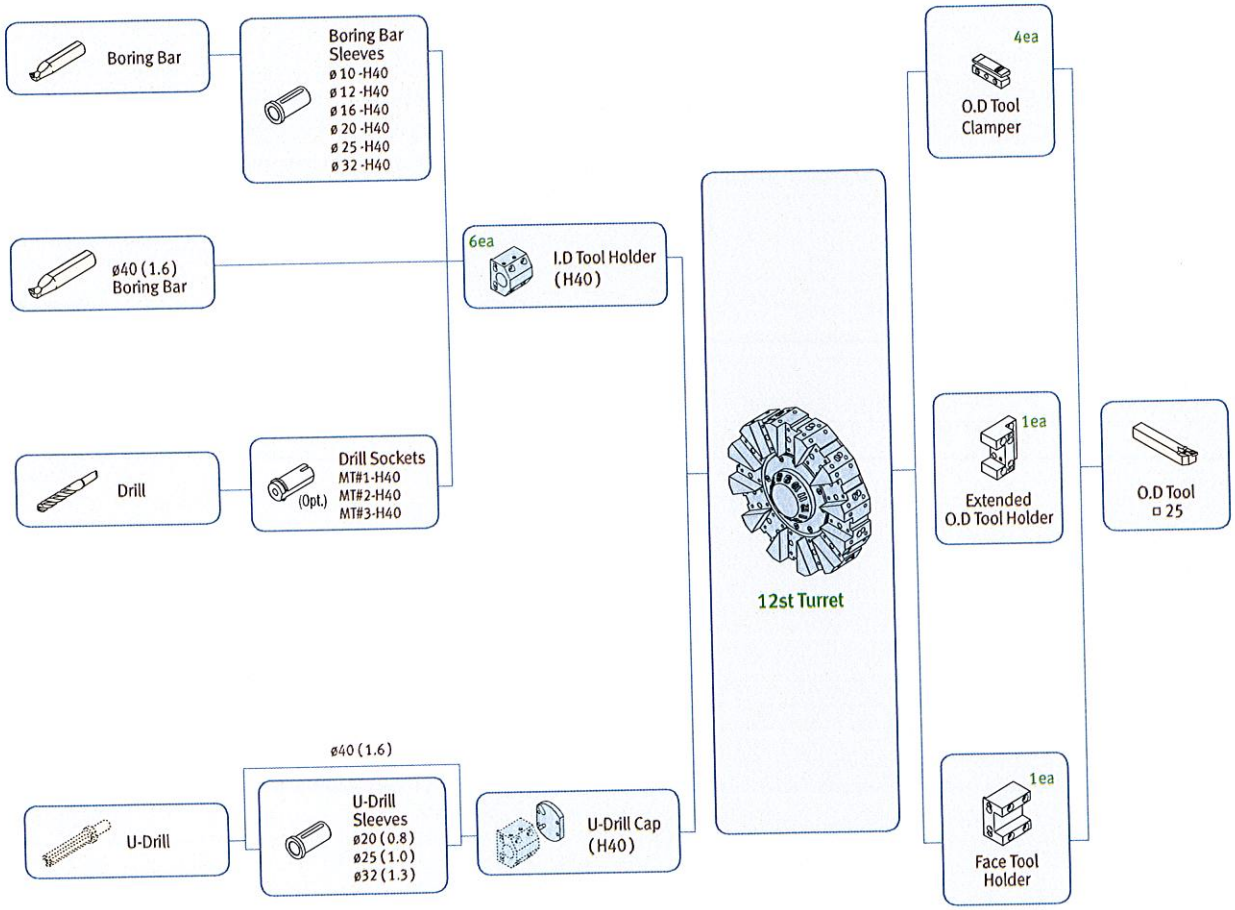
※ Cutting time table shown above is the results from real test cutting. The results can be different on cutting condition and strategy.

Total cutting time **80.3** s
in heavy cutting conditions

Tooling system

Lynx 220A / B / C [LA / LB / LC] series

Unit : mm (inch)

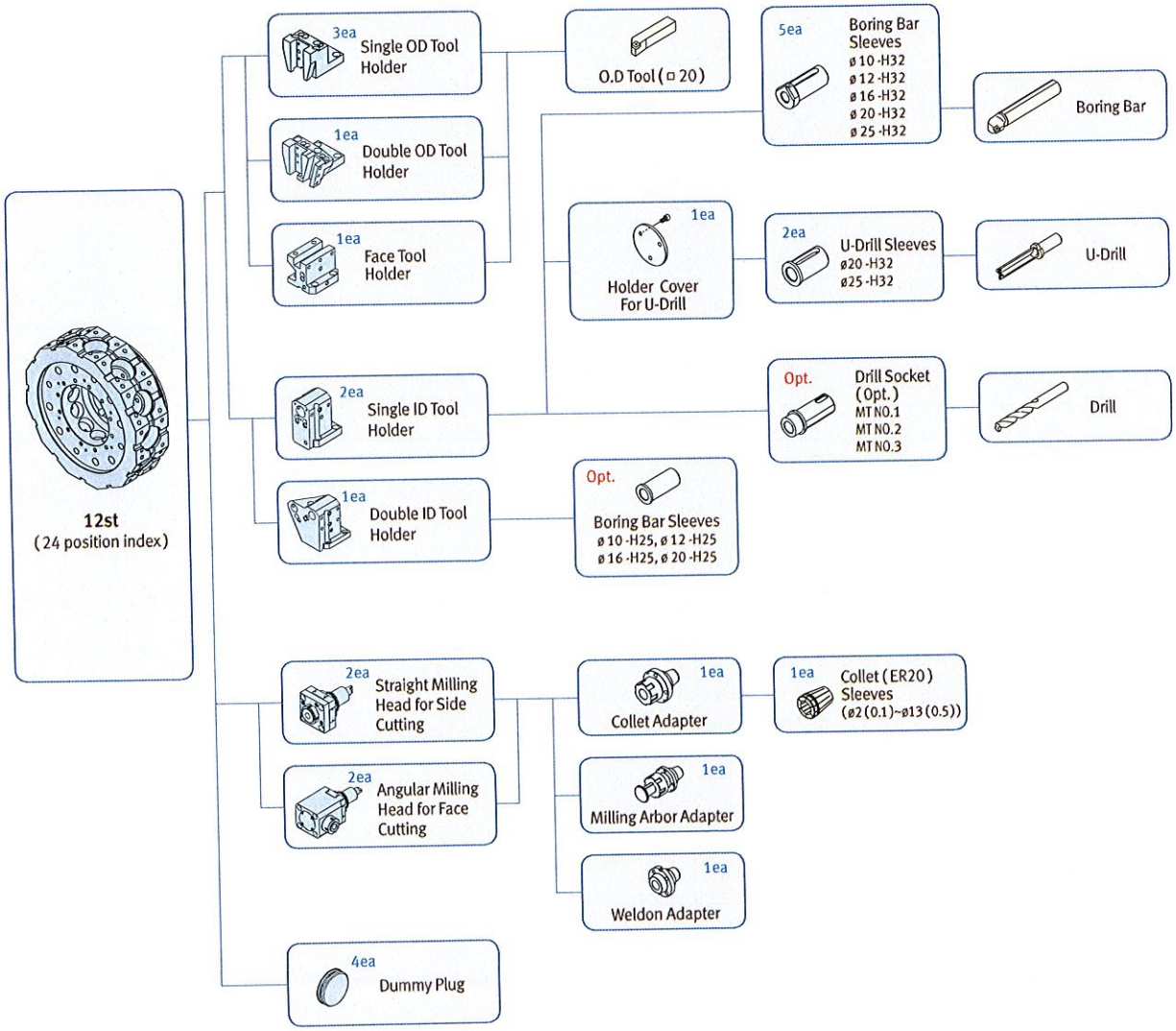


Note) Above tooling system is our recommendation.
Depending on export condition, the standard tooling packed with the machine can be different.

Tooling System

Lynx 220MA / MC [LMA / LMC]

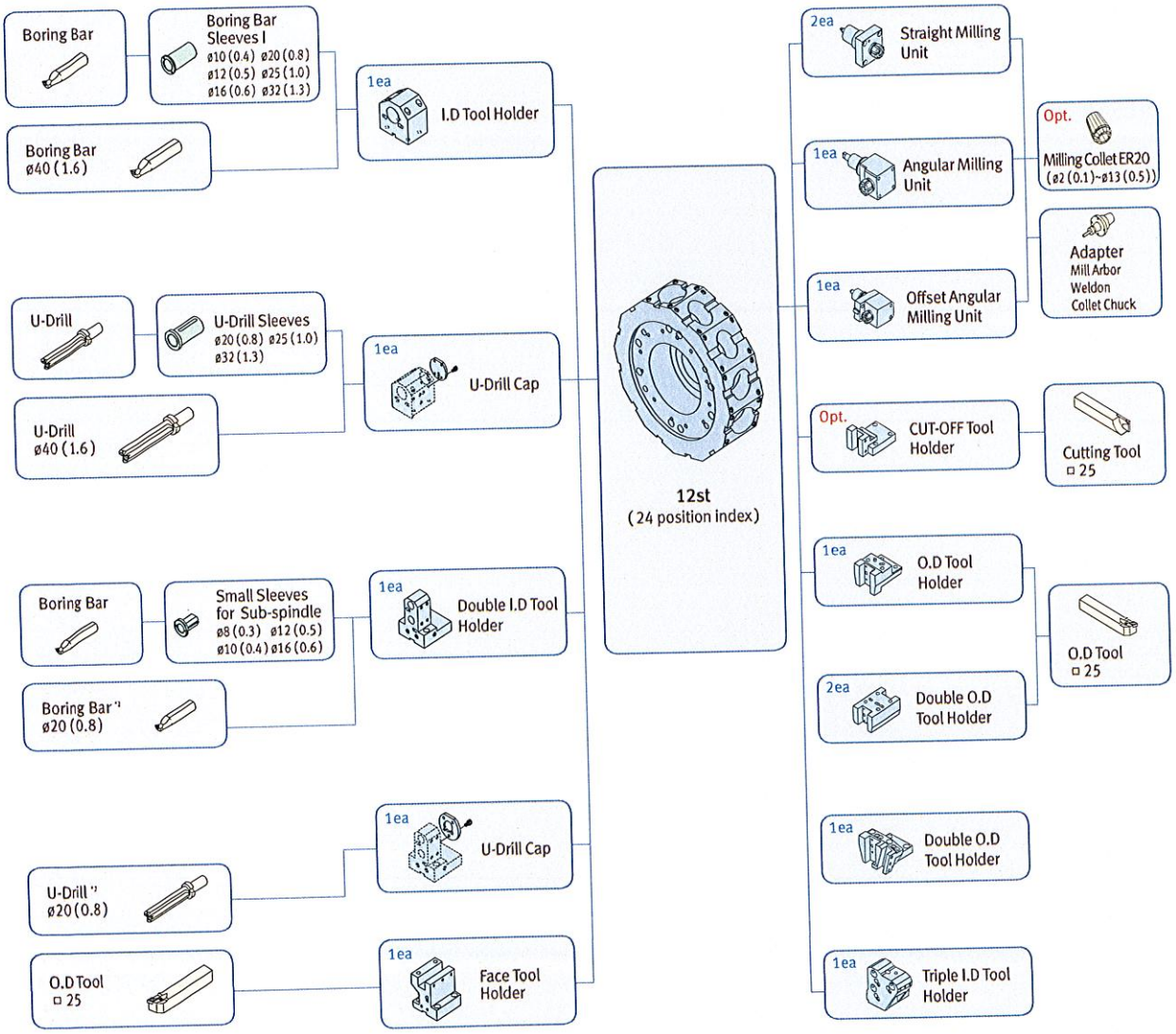
Unit : mm (inch)



Note) Above tooling system is our recommendation.
Depending on export condition, the standard tooling packed with the machine can be different.

Lynx 220LMSA / LMSC

Unit : mm (inch)



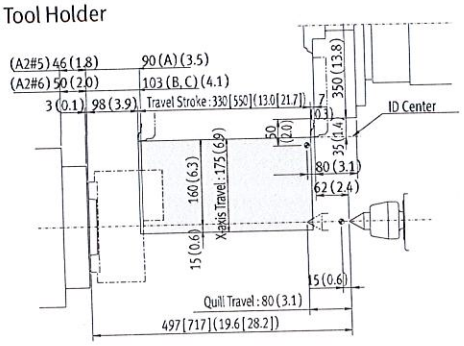
Note) Above tooling system is our recommendation.
Depending on export condition, the standard tooling packed with the machine can be different.

Working Range

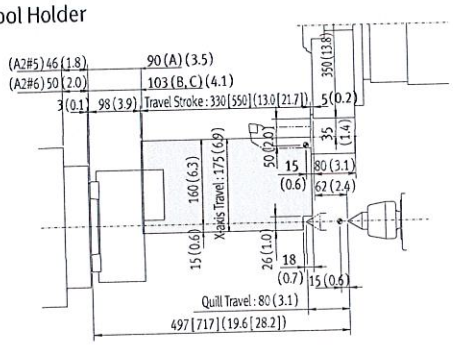
Lynx 220A / B / C series

Unit : mm (inch)

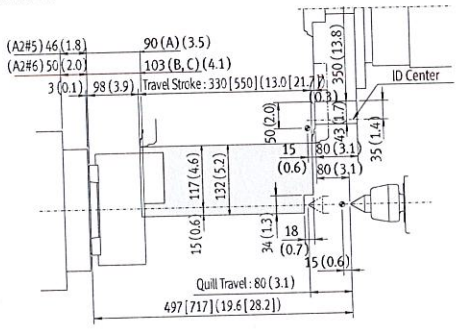
OD Tool Holder



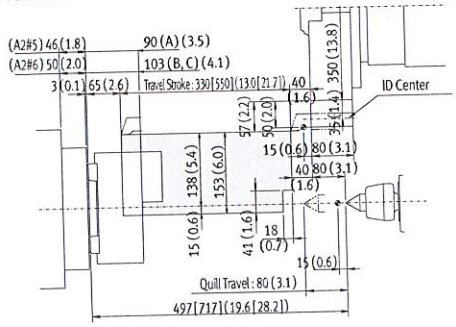
ID Tool Holder



Extended OD Tool Holder



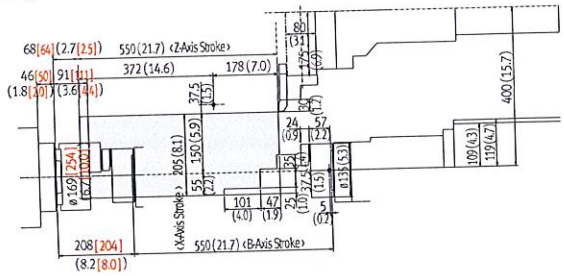
Face Tool Holder



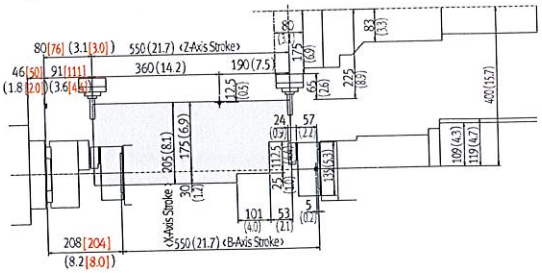
Lynx 220LMSA [LMSC]

Unit : mm (inch)

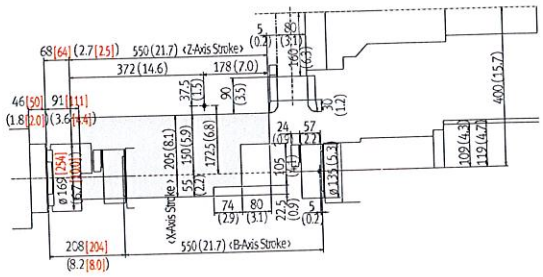
Single OD Tool Holder



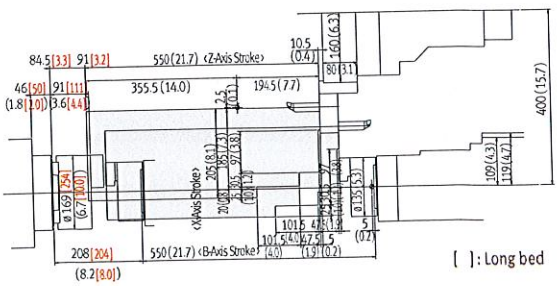
Single ID Tool Holder



Double OD Holder



Double ID Tool Holder

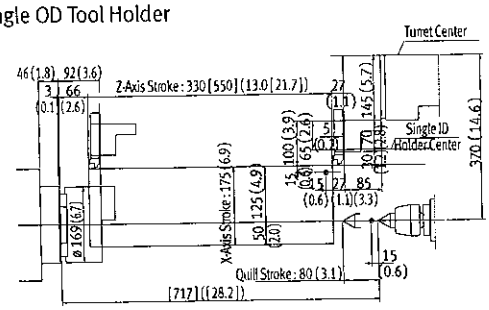


[ ] : Long bed

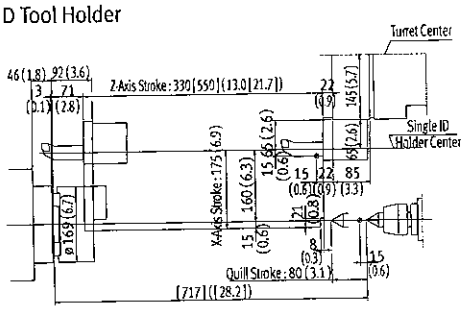
Lynx 220M [LM]

Unit : mm (inch)

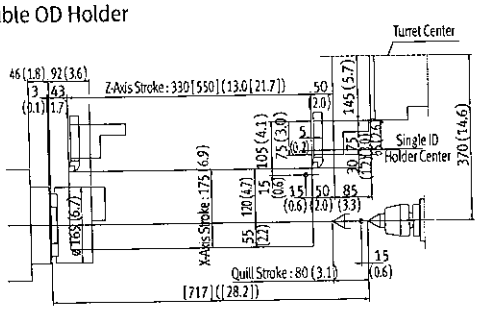
Single OD Tool Holder



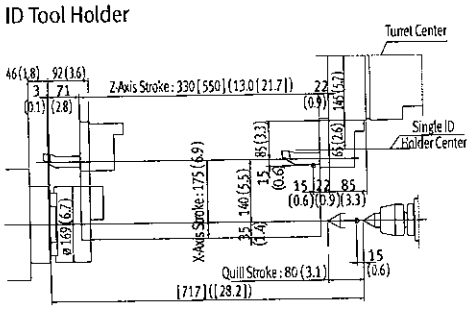
Single ID Tool Holder



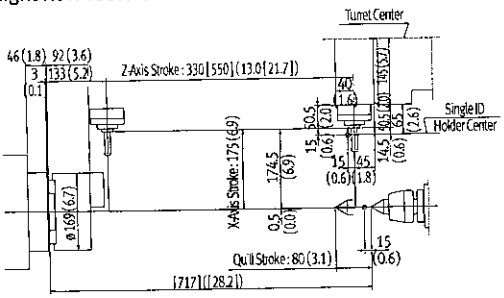
Double OD Holder



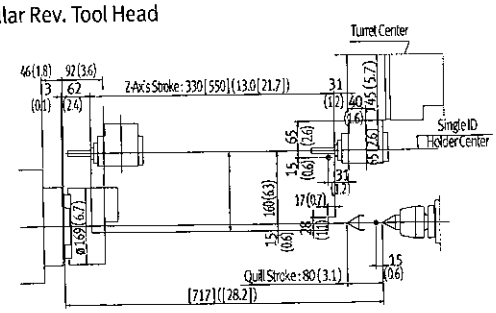
Double ID Tool Holder



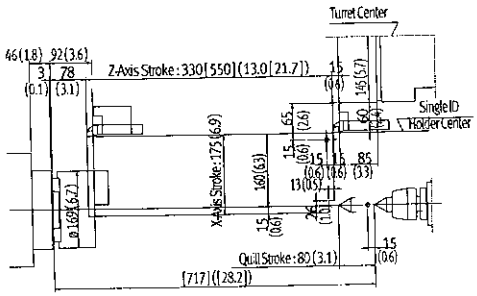
Straight Rev. Tool Holder



Angular Rev. Tool Head



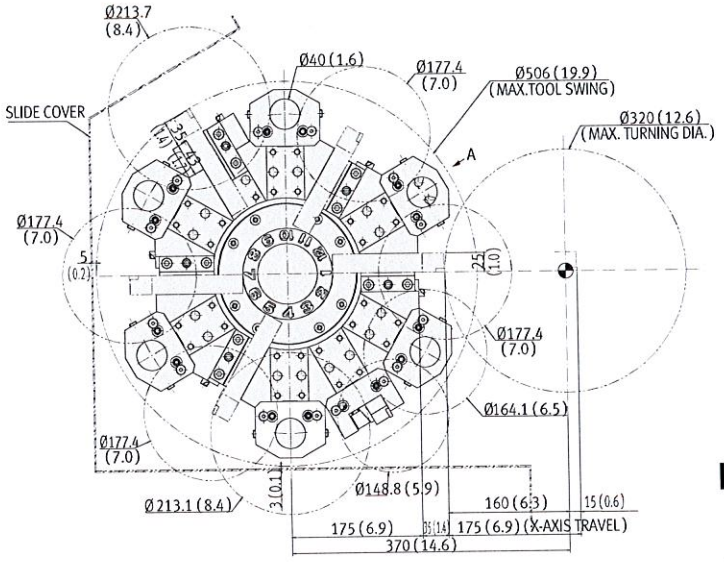
Face Tool Holder



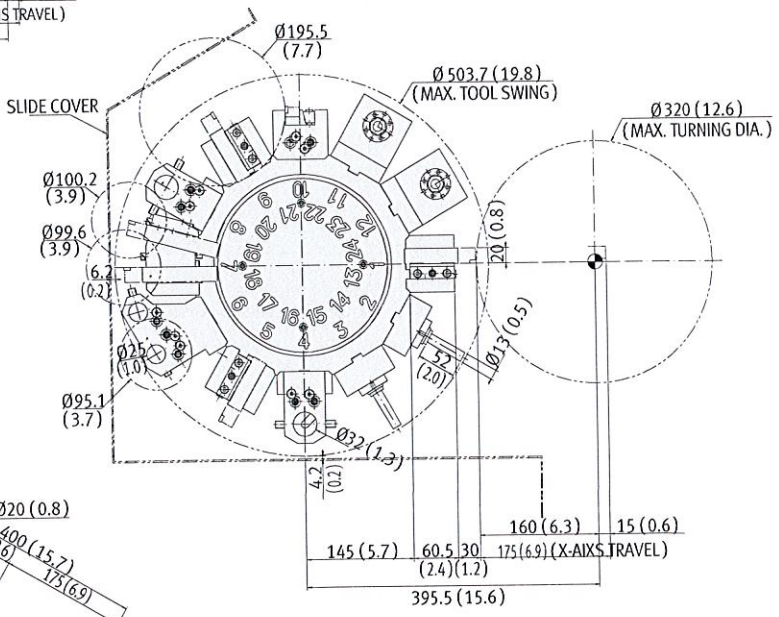
Tool Interference Diagram

Lynx 220A / B / C / LA / LB / LC

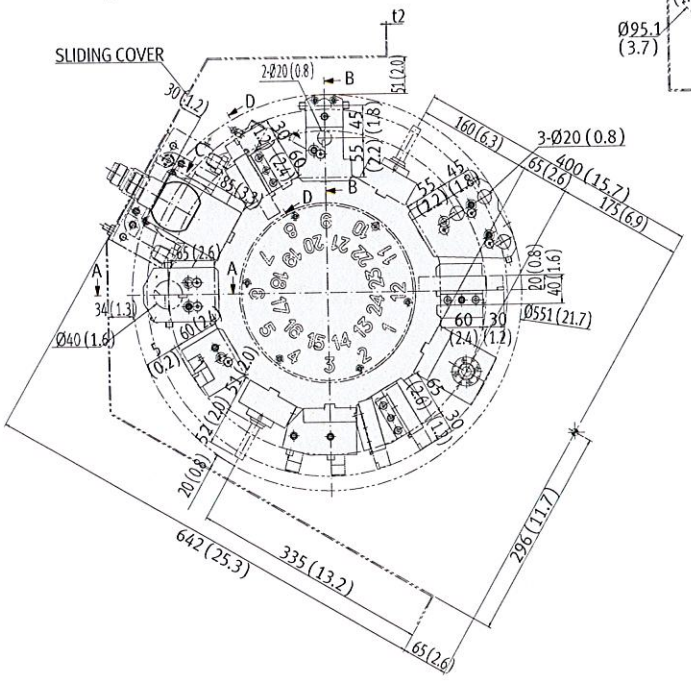
Unit : mm (inch)



Lynx 220MA / MC / LMA / LMC



Lynx 220LMSA / LMSC

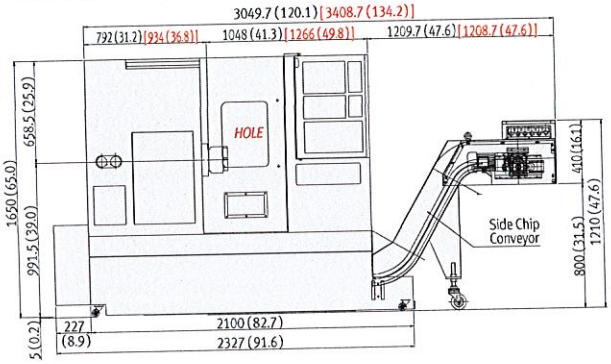


External Dimensions

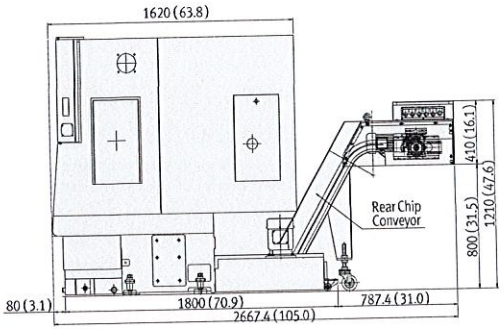
Lynx 220A / B / C [LA / LB / LC]

Unit : mm (inch)

Front View



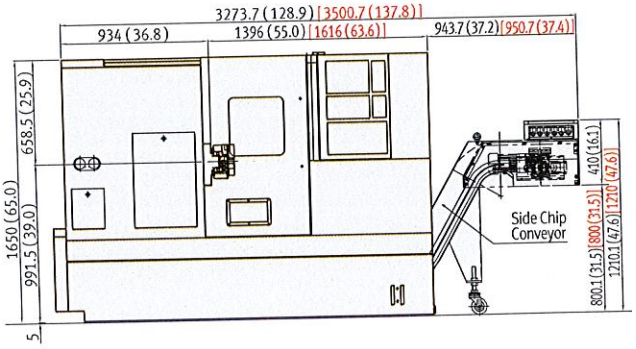
Side View



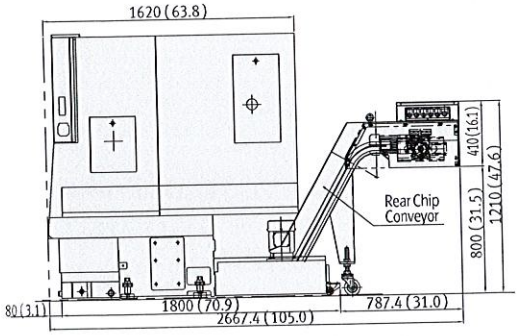
Unit : mm (inch)

Lynx 220MA / MC [LMA / LMC]

Front View

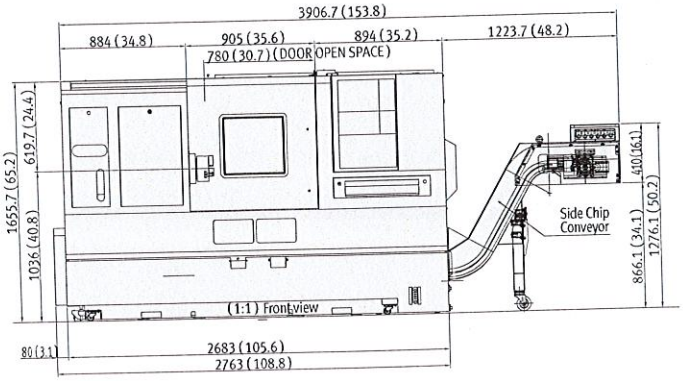


Side View

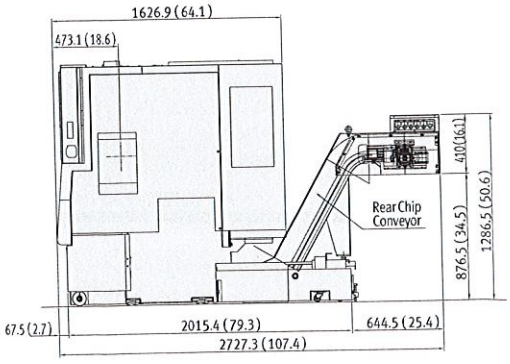


Lynx 220LMSA / LMSC

Front View



Side View



Machine Specifications

Features			Unit	Lynx 220A [LA]	Lynx 220B [LB]	Lynx 220C [LC]	Lynx 220MA [LMA]	Lynx 220MC [LMC]	Lynx 220LMSA	Lynx 220LMSC
Capacity	Swing over bed		mm (inch)	510 (20.1)					600 (23.6)	
	Swing over saddle		mm (inch)	290 (11.4)					400 (15.7)	
	Recom. Turning diameter		mm (inch)	170 (6.7)	210 (8.3)		170 (6.7)	210 (8.3)	170 (6.7)	210 (8.3)
	Max. Turning diameter		mm (inch)	320 (12.6)			250 (9.8)		300 (11.8)	
	Max. Turning length		mm (inch)	322 [542] (12.7 [21.3])	305 [525] (12.0 [20.7])		290 [510] (11.4 [20.1])		510 (20.1)	
	Chuck size		inch	6	8	8	6	8	6	8
	Bar working diameter		mm (inch)	45 (1.8)	51 (2.0)	65 (2.6)	51 (2.0)	65 (2.6)	51 (2.0)	65 (2.6)
Travels	Travel distance	X-axis	mm (inch)	175 (6.9)					205 (8.1)	
		Z-axis	mm (inch)	330 [550] (13.0 [21.7])			330 [550] (13.0 [21.7])		550 (21.7)	
		B-axis	mm (inch)	-					550 (21.7)	
Feedrate	Rapid Traverse Rate	X-axis	m/min (ipm)	30 (1181.1)						
		Z-axis	m/min (ipm)	36 (1417)						
		B-axis	m/min (ipm)	-					30 (1181.1)	
	Cutting feedrate		m/min (ipm)	500 / 500 (19.7 / 19.7)						
Main spindle	Max. Spindle speed		r/min	6000	5000	4000	6000	4500	6000	4500
	Spindle nose		ASA	A2 #5	A2 #6	A2 #6	A2 #5	A2 #6	A2 #5	A2 #6
	Spindle bearing diameter (Front)		mm (inch)	90 (3.5)	100 (3.9)	110 (4.3)	90 (3.5)	110 (4.3)	90 (3.5)	110 (4.3)
	Spindle through hole		mm (inch)	53 (2.1)	61 (2.4)	76 (3.0)	61 (2.4)	76 (3.0)	61 (2.4)	76 (3.0)
	Min. spindle Indexing angle (C-axis)		deg	-			0.001			
Turret	No. of tool stations		ea	12			12 (24 POSITION INDEX)			
	OD tool size		mm (inch)	25 x 25 (1.0 x 1.0)			20 x 20 (0.8 x 0.8)			
	Max. boring bar size		mm (inch)	40 (1.6)			32 (1.3) (SINGLE ID) / 25 (1.0) (DOUBLE ID)		40 (1.6) (MAIN) / 20 (0.8) (SUB)	
	Turret Indexing time (1 station swivel)		s	0.11						
	Max. Rotary tool speed		r/min	-			6,000			
Tail Stock	Quill diameter		mm (inch)	65 (2.6)						
	Quill bore taper		MT	MT#4						
	Quill travel		mm (inch)	80 (3.1)						
Sub spindle	Spindle speed		r/min	-					6,000	
	Spindle nose		FLAT	-					ø110	
	Spindle bearing diameter (Front)		mm (inch)	-					75 (3.0)	
	Spindle through hole		mm (inch)	-					43 (1.7)	
	Min. spindle Indexing angle (C-axis)		deg	-					0.001	
Motors	Main spindle motor power (30min./ cont.)		kW (Hp)	15 / 11 (20.1 / 14.8)						
	Sub spindle motor power		kW (Hp)	-					5.5 / 3.7 (7.4 / 5.0)	
	Rotary tool motor power		kW (Hp)	-			3.7 (5.0)		3.7 (5.0)	
	Coolant pump motor power		kW (Hp)	0.4 (0.5)					1.1 (1.5)	
Power source	Electric power supply (rated capacity)		kVA	23.7					31.71	
Machine Dimensions	Height		mm (inch)	1655 (65.2)						
	Length		mm (inch)	2325 [2560] (91.5 [100.8])			2410 [2630] (94.9 [103.5])		2763 (108.8)	
	Width		mm (inch)	1600 (63.0)					1627 (64.1)	
	Weight		kg (lb)	2900 [3100] (6393.3 [6834.2])			3100 [3300] (6834.2 [7275.1])		3400 (7495.6)	3500 (7716.1)

Standard feature

- Coolant supply equipment
- Foot switch
- Front door interlock
- Full enclosure chip and coolant shield
- Hand tool kit (including small tool for operations)
- Hydraulic chuck and actuating cylinder (tool holders & boring sleeves)
- Hydraulic power unit
- Levelling jack screw and plates
- Lubrication equipment
- Soft jaws
- Standard tooling kit
- Tail stock (Lynx 220LA / LB / LC / LMA / LMC)
- Work light

Optional feature

- Additional tool holders & sleeves
- Air blast for chuck jaw cleaning
- Air gun
- Automatic door
- Automatic measuring system (in process touch probe)
- Automatic power off
- Automatic work loading
- Bar feeder interface
- Chip conveyor
- Chip bucket
- Hardened & ground jaws
- Oil skimmer
- Parts catcher (Lynx 220 : ø 65 x L140)
- Pressure switch for chucking pressure check
- Proximity switches for chuck clamp detection
- Proximity switches for tail stock quill position detection*1
- Signal tower (yellow, red, green)
- Special chucks
- Tool pre-setter (hydraulic type)
- Tool pre-setter (manual type)

*1 : This is available as option when tail stock is applied to the machine.

- The specifications and information above-mentioned may be changed without prior notice.
- For more details, please contact Doosan