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MANFORD 2023.02



MANFORD

POWER & DETERMINATION

DOUBLE COLUMN MACHINING CENTER

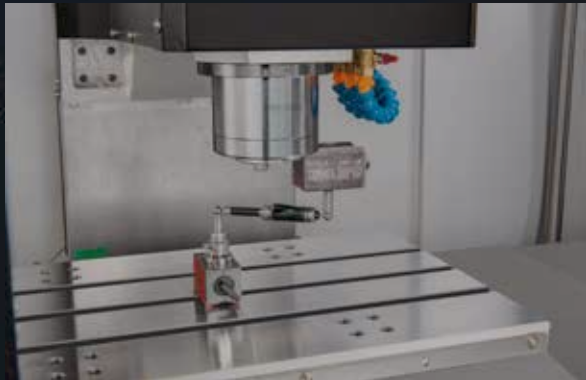
Professional Equipment for Strict Quality Control



CMM Measurement



Laser Inspection



Ballbar Test



Spindle Noise & Vibration check



Thermal Compensation



Machine Cutting Test



DMG MORI Tool Presetter UNO Series

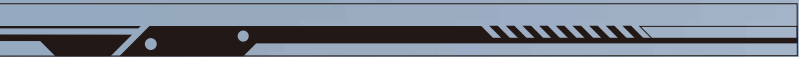
Internal Processing Department

Manford is able to offer high quality customized parts with fast delivery.

Highly professional and experienced hand scrapping team for machine assembly .



DL-2112

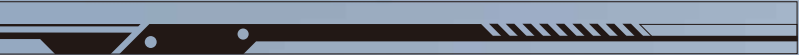


DOUBLE COLUMN MACHINING CENTER

Machine Spec.	
X axis Travel	1,500/2,100/3,100/4,100 mm
Y axis Travel	1,220 mm
Z axis Travel	800 mm
Spindle Nose to Table Surface	#40 100 ~ 900 mm (opt.: #50 100 ~ 900 mm)
Distance between Column	1,400 mm



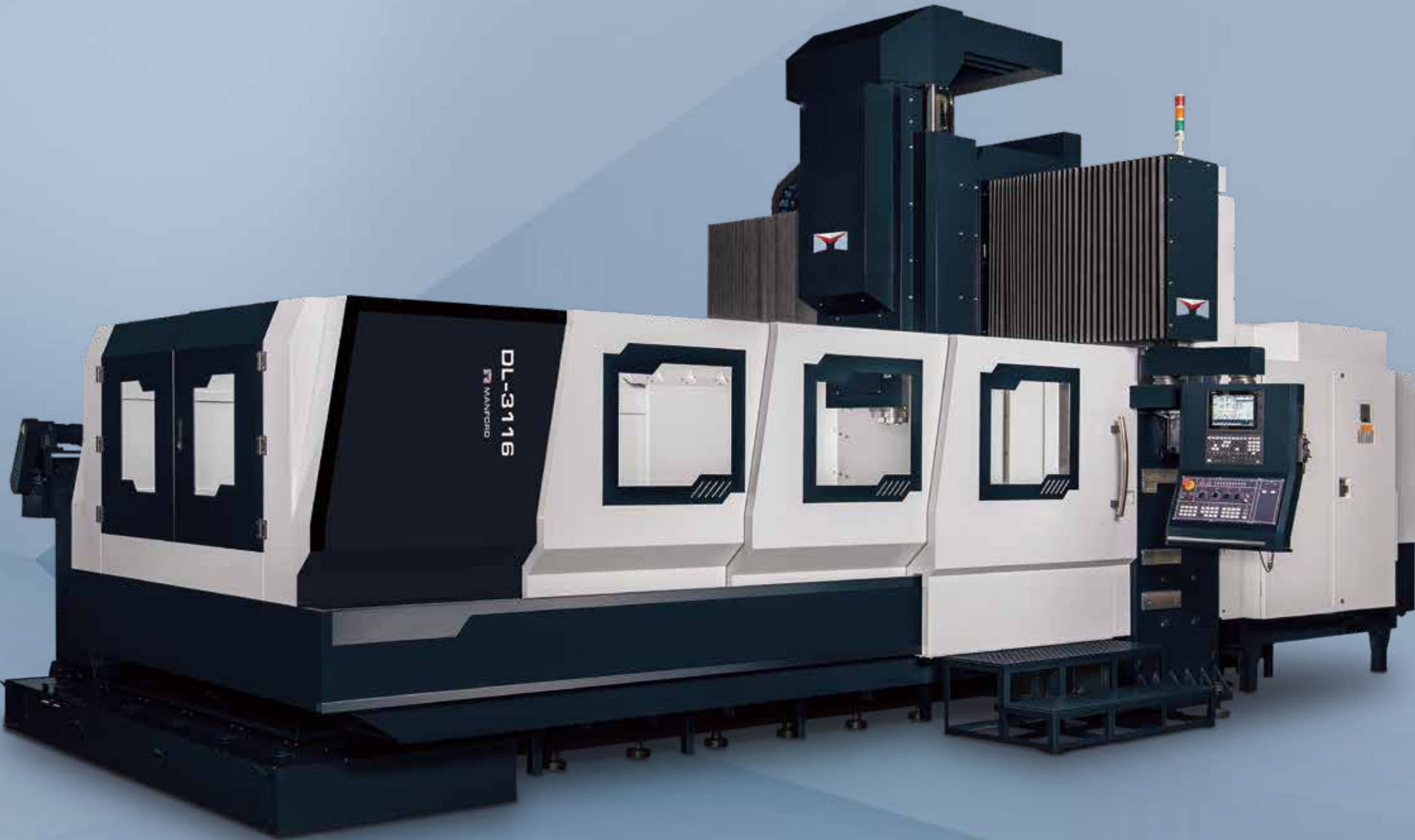
DL-3116



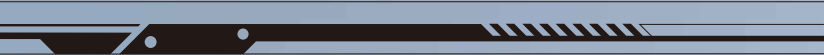
DOUBLE COLUMN MACHINING CENTER



X axis Travel	2,100/3,100/4,100 mm
Y axis Travel	1,620 mm
Z axis Travel	800 mm(Opt. 1,020 mm)
Spindle Nose to Table Surface	#50 150 ~ 950 mm (opt.: 150 ~ 1,170 mm)
Distance between Column	1,700 mm



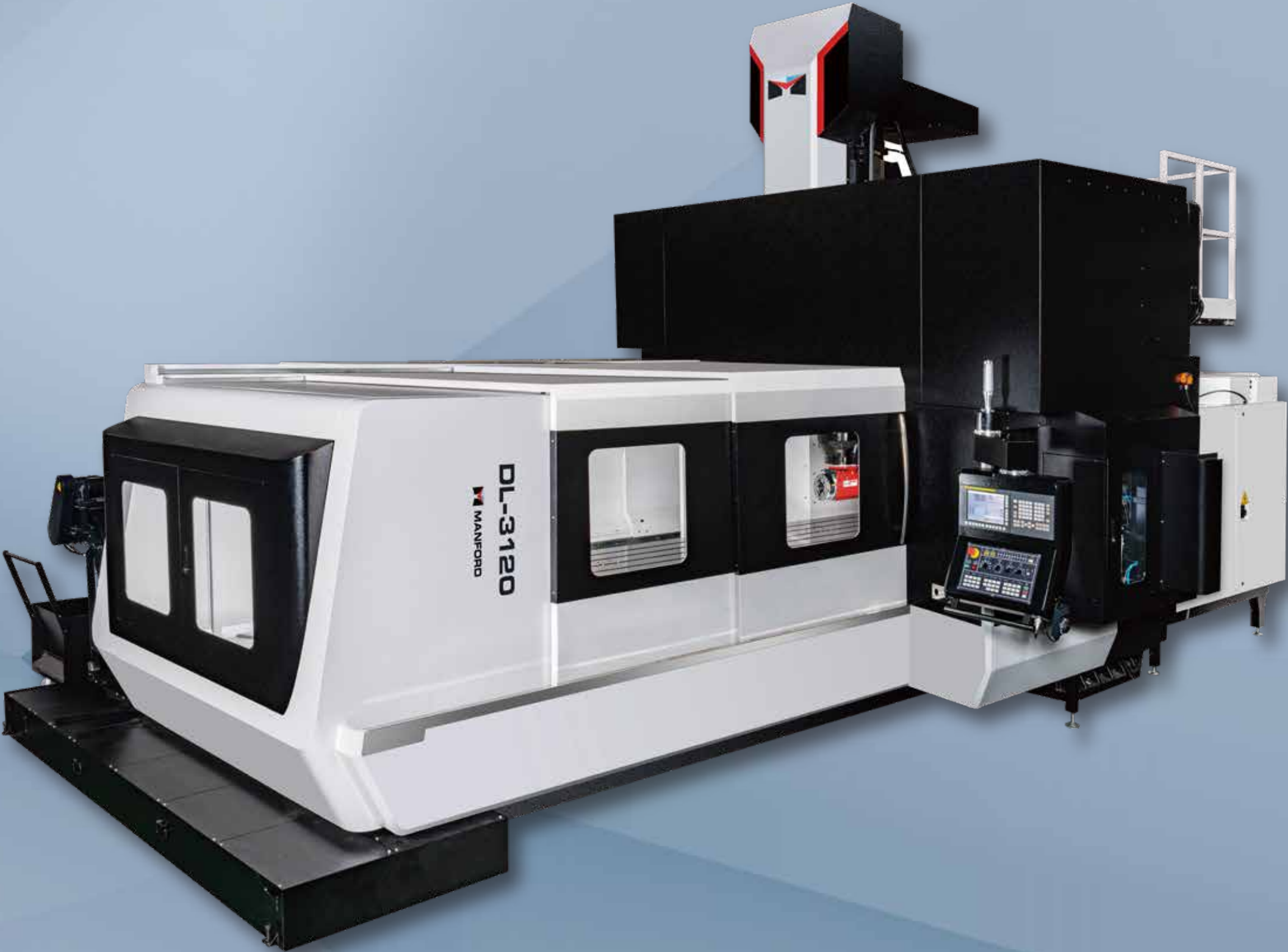
DL-3120



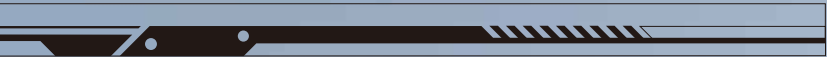
DOUBLE COLUMN MACHINING CENTER



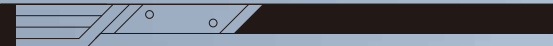
X axis Travel	3,100/4,100 mm
Y axis Travel	2,020 mm
Z axis Travel	800 mm(opt.: 1,020 mm)
Spindle Nose to Table Surface	150 ~ 950 mm (opt.: 150 ~ 1,170 mm)
Distance between Column	2,100 mm



DL-5232



DOUBLE COLUMN MACHINING CENTER



X axis Travel	5,200 mm
Y axis Travel	3,200 mm
Z axis Travel	800mm (opt.: 1,000/1,200 mm)
Spindle Nose to Table Surface	#50 200 ~ 1,000 mm (opt.: 200 ~ 1,400 mm)
Distance between Column	3,400 mm

*700mm of Yaxis travel and 500mm of column height can be extended in order to install 90-dearee or two-axes milling head.



MACHINE STRUCTURE

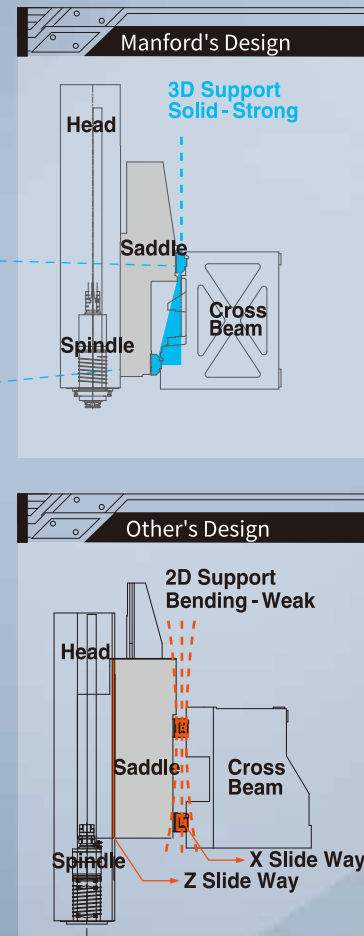
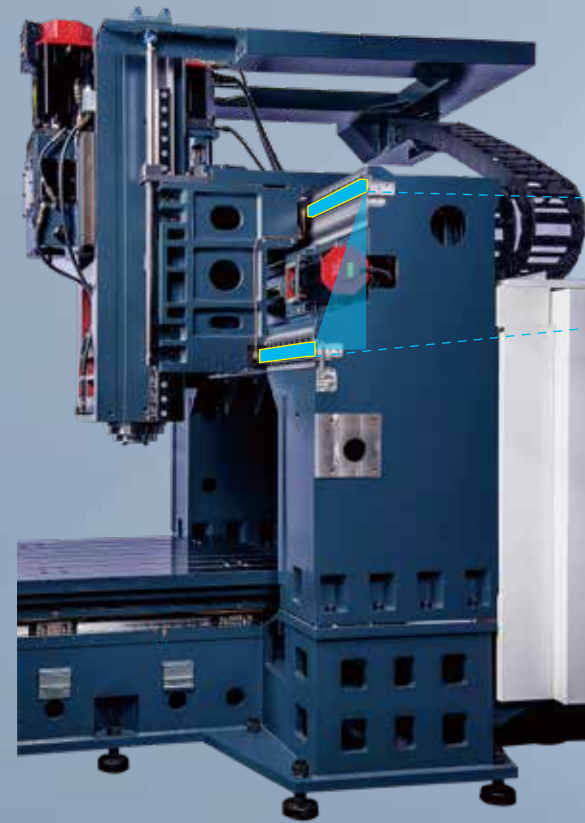
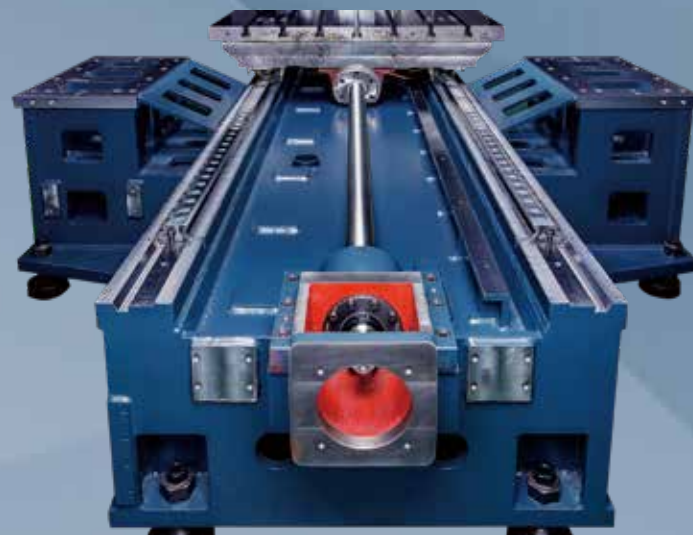


Table Design - Low Center Of Gravity

Easy accessibility for workpiece loading.
The large span between X-axis slide ways
reduces geometric-error on the table.



State-of-the-Art Hand Scrapping

Precision hand scrapping is applied on Z axis contact surface for machine model:

DL-2116, 3116, 4116, 3120, 4120



Auxiliary Box Guide Ways on Z axis (DL-3120 / DL-4120)

Optimum axial rigidity

The majority of cutting vibration is absorbed by
Z axis. For the maximum damping coefficient,
in addition to the heavy duty linear roller guide
ways, the hardened box ways are added to the
head stock ram of machine.



MACHINE ACCESSORIES



CTS System (Optional)



Head Storage (Optional)



JAPAN LHL Lubrication System

Vertical / Horizontal ATC System

Machine with milling head and equipped with V/H ATC system can provides quick tool change and increase productivity.

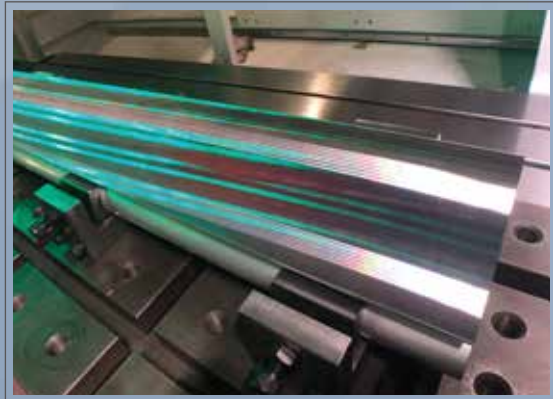


Reliable Automatic Tool Changer

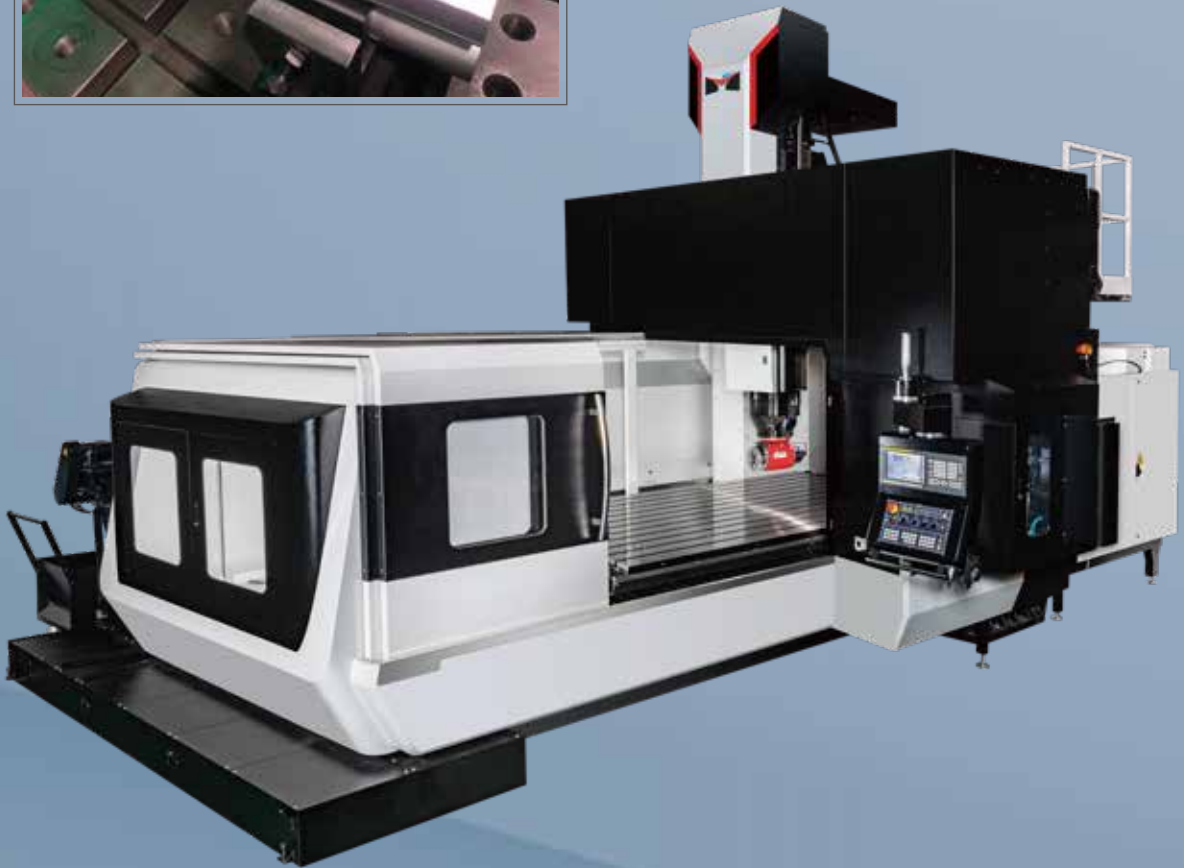
Manford Double Column Machining Centers adopts chain type automatic tool changer, which is side-mounted on the machine base, the independent structure avoids splashes from cutting chips or coolant.



CUTTING PERFORMANCE

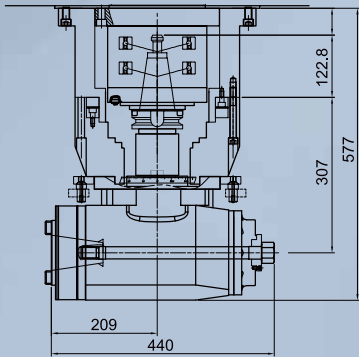


DL-3120	
Spindle Type	Gear spindle
Milling Head	90° milling head
Workpiece Material	EN AW-Al T66
Cutter	Boring tool
Cutting Condition	1st S=1,600 F=300 ; 2nd S=1,800 F=200
Total Machining Time	13 mins 26 secs
Customer Request	17 mins
23% Time saved!	

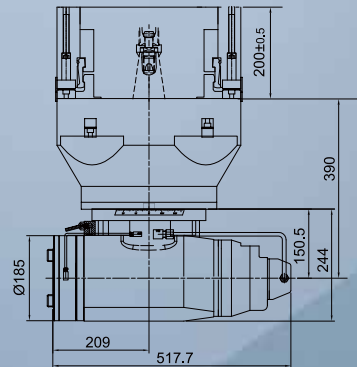


MILLING HEAD

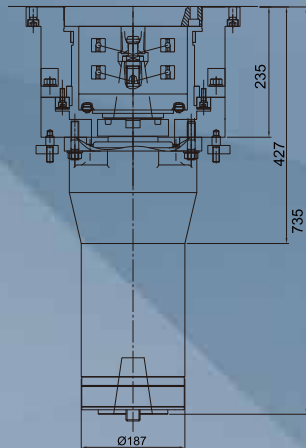
Model	M55
Head Clamping System	Manual
Spindle Taper	#50
Spindle Speed	3,500 rpm
Division Angle	"5 ° (opt.: 2.5° /1°)"
Tool Clamping System	Auto Hydraulic
C axis Swiveling Angle	360 °
CTS system	Opt.



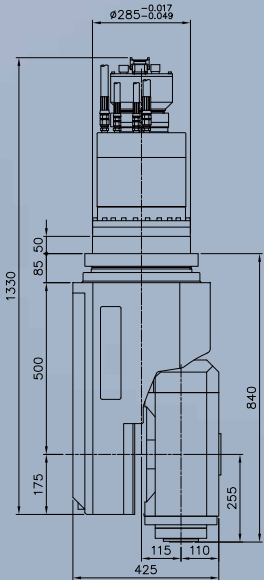
Model	A55
Head Clamping System	Auto Clamp
Spindle Taper	#50
Spindle Speed	3,500 rpm
Division Angle	"5 ° (opt.: 2.5° /1°)"
Tool Clamping System	Auto Hydraulic
C axis Swiveling Angle	360 °
CTS System	opt.



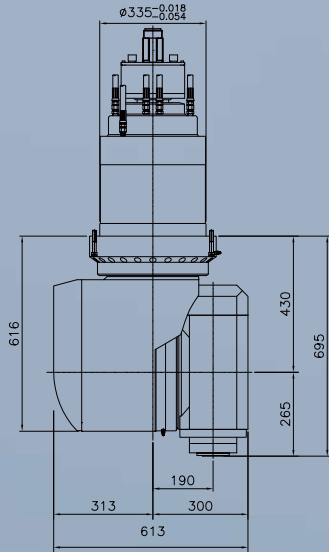
Model	A62
Head Clamping System	Auto Clamp
Spindle Taper	#50
Spindle Speed	3,500 rpm
Tool Clamping System	Auto Hydraulic
CTS System	opt.



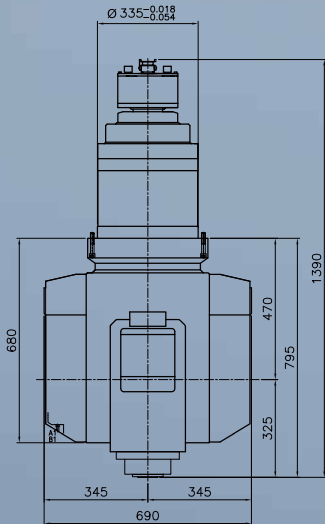
Model	C67M01
Tool Interface	HSK A63
Spindle Speed	18,000 rpm
Spindle Motors	29.5 kW S1 Cont. / 37kW S6 ts=2 min
Spindle Torque	70 Nm S1 Cont. / 88 Nm S6 ts=2 min
Spindle Lubrication	Oil air
Max. Torque C/A	A: 525 Nm / C: 318 Nm
Max. Slamping Torque C/A	1,900 Nm
Max. Swiveling Angle C/A	C: ±240° / A: ±110°
Measurement System	absolute
Accuracy Grade	C: ±2.5" / A: ±1.9"
Function	CTS



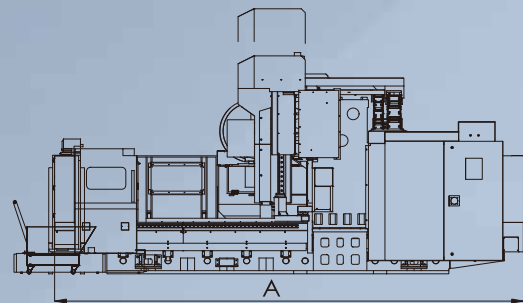
Model	C67M02
Tool Interface	HSK A63
Spindle Speed	2,4000 rpm
Spindle Motors	30 kW S1 Cont. / 37 kW S6 ts=2 min
Spindle Torque	72 Nm S1 Cont. / 88 Nm S6 ts=2 min
Spindle Lubrication	Oil air
Max. Torque C/A	993 Nm
Max. Slamping Torque C/A	2,000 Nm
Max. Swiveling Angle C/A	C: ±220° / A: ±115°
Measurement System	absolute
Accuracy Grade	±2"
Function	CTS



Model	C68
Tool Interface	HSK A63
Spindle Speed	24,000 rpm
Spindle Motors	30 kW S1 Cont. /37 kW S6 ts=2 min
Spindle Torque	72 Nm S1 Cont./88 Nm S6 ts=2 min
Spindle Lubrication	Oil air
Max. Torque C/A	A:1,378 Nm/ C:1,500 Nm
Max. Slamping torque C/A	2,000 Nm
Max. Swiveling angle C/A	C: ±220° / A: ±110°
Measurement system	absolute
Accuracy Grade	±2"
Function	CTS

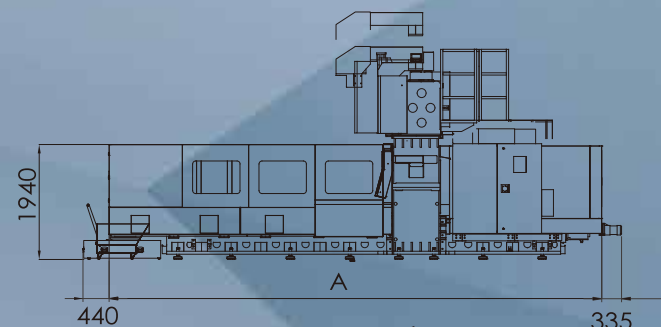


DL-1512/2112/3112/4112



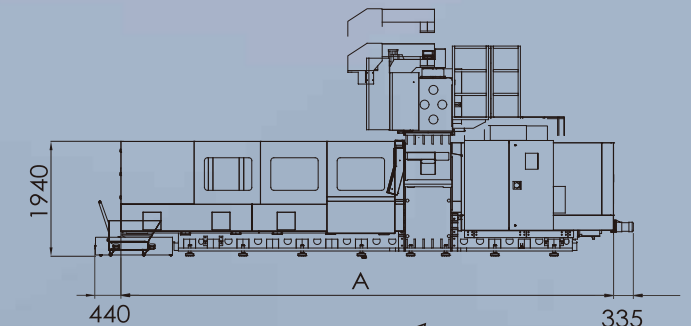
UNIT:mm

DL-2116/3116/4116

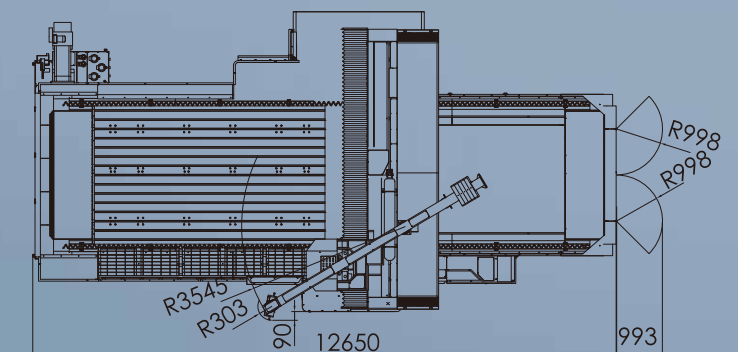
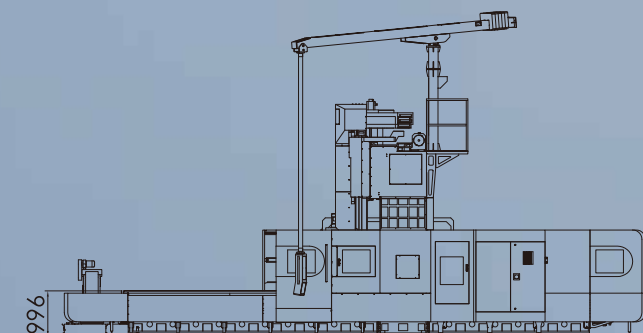


Technical drawing of the front view of a machine. The drawing shows a central motor unit with horizontal cooling fins. To the left is a control panel with various buttons and a display. To the right is a large cylindrical component, possibly a pump or motor. Dimensions are indicated with leader lines and labels: R717, R717, R1000, R1008, 920, 84/78, R748, and A.

DL-3120/4120



DL-5232



* The manufacturer reserves the right to modify the design, specifications, mechanisms, etc. to improve the performance of the machine.

MACHINE SPECIFICATIONS

Specification	DL-1512	DL-2112	DL-3112	DL-4112	DL-2116	DL-3116	DL-4116
X travel	1,500 mm	2,100 mm	3,100 mm	4,100 mm	2,100 mm	3,100 mm	4,100 mm
Y travel	1,220 mm				1,620 mm		
Z travel	800 mm				800 mm (opt.: 1,020)		
Spindle Nose to Table Surface	#40: 100 ~ 900 mm (opt.: #50 100 ~ 900 mm)				150 ~ 950 mm (opt.: 150 ~ 1,170 mm)		
Distance between Two Columns	1,400 mm				1,700 mm		
Table							
Table Size	1,400 x 1,100 mm	2,000 x 1,100 mm	3,000 x 1,100 mm	4,000 x 1,100 mm	2,000 x 1,500 mm	3,000 x 1,500 mm	4,000 x 1,500 mm
T-slot (size x no. x dist.)	2 mm x 7 x 150 mm				9 x 22 mm x 150 mm		
Max. Table Load	2,500 kgs	4,000 kgs	5,000 kgs	6,000 kgs	5,000 kgs	8,000 kgs	10,000 kgs
Spindle							
Spindle Taper	ISO #40 (opt.: ISO #50)				ISO #50 (opt.: ISO #40)		
Spindle Speed	#40: direct type 10,000 rpm (opt.: direct type 12,000 / 15,000 rpm) (opt.: #50 gear type 6,000 rpm)				#50 with 2 steps gear 6,000 rpm (opt.: #40 10,000 rpm)		
Spindle Motor	#40: 11/15 kW				#50: 15 / 18.5 kW		
Feedrate							
Rapid Feedrate (X/Y/Z)	12/15/15 M/min	12/15/15 M/min	10/15/15 M/min	10/15/15 M/min	12/15/12 M/min		
Cutting Feedrate	1 ~ 10,000 mm/min	1 ~ 10,000 mm/min	1 ~ 5,000 mm/min	1 ~ 5,000 mm/min	1 ~ 10,000 mm/min		
Axis Motor							
Axis Motors	9 / 4.5 / 4.5 kW				7/4.5/4.5 kW	9 / 7 / 4.5 kW	
ATC							
Tool Stroage Capacity	#40: arm type 24 Tools				chain type 32 Tools		
Others							
Coolant Tank Capacity	450 L	550 L			800 L	900 L	
3 axes Slide Ways	X / Y / Z：roller type linear guide				X / Y：roller type linear guide Z：box ways		
Air Source	5 ~ 7 kg/cm ²				5 ~ 7 kg/cm ²		
Machine Gross Weight	11,500 kgs	15,500 kgs	19,500 kgs	23,500 kgs	28,000 kgs	30,000 kgs	35,000 kgs

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MACHINE SPECIFICICATIONS

Specification	DL-3120	DL-4120	DL-5232
X Travel	3,100 mm	4,100 mm	5,200 mm
Y Travel	2,020 mm		3,200 mm
Z Travel	800 mm (opt.: 1,020)		800 mm(opt.: 1,000/1,200)
Spindle Nose to Table Surface	150 ~ 950 mm (opt.: 150 ~ 1,170 mm)		200 ~ 1,000 mm
Distance between Two Columns	2,100 mm		3,400 mm
Table			
Table Size	3,000 x 1,800 mm	4000 x 1,800 mm	5,000 x 3,000 mm
T-slot (size x Q' ty x dist.)	22 mm x 11 x 150 mm		128 mm x 5 x 200 mm
Max. Table Load	10,000 kgs	12,000 kgs	18,000 kgs
Spindle			
Spindle Taper	ISO #50		ISO #50
Spindle Speed	#50 with 2 steps gear 6,000 rpm		#50 with 2 steps gear 6,000 rpm
Spindle Motor	#50: 15/18.5 kW		#50: 15/18.5 kW
Feedrate			
Rapid Feedrate (X/Y/Z)	12/15/12 M/min		10/15/15 M/min
Cutting Feedrate	1 ~ 10 M/min		1 ~ 10 M/min
Axis Motor			
Axis Motors	9 / 7 / 7 kW		9 / 7 / 7 kW
ATC			
Tool Stroage Capacity	chain type 32 tools		chain type 32 tools
Others			
Coolant Tank Capacity	950 L		800 L
3 axes Slide Ways	X / Y: roller type linear guide Z: box ways		X / Y: roller type linear guide Z: box ways
Air Source	5 ~ 7 kg/cm ²		5 ~ 7 kg/cm ²
Machine Gross Weight	33,000 kgs	38,000 kgs	55,000 kgs

* The manufacturer reserves the right to modify the design, specifications, mechanisms,etc. to improve the performance of the machine.

Standard accessoies

- Dual auger chip removal system
 - Chain type chip conveyor
 - Oil cooler
 - Heat exchanger for electrical cabinet
 - Automatic lubrication system
 - Cutting coolant system
- Semi guarding (without top cover)
 - Automatic power off
 - Program light / 3-color work light
 - Remote handwheel
 - Leveling bolts & blocks
 - Tools & box (not including installation tools)

Optional accessories

- CNC Controller

- FANUC 0iMF PLUS controller
 - SIEMENS 828D / ONE controller
 - HEIDENAHIN TNC620 / 640 controller
- Machine guarding

- Full enclosed guarding with top cover (Manford standard type)
- Mechanical items

- Coolant through spindle 30/70 bar
 - Air conditioner for electrical cabinet
 - Transformer
 - Oil skimmer
 - Oil mist collector
 - Milling head
 - JAPAN LHL grease lubrication system
- Measurement

- Automatic tool measuring system
 - Automatic work piece measuring system
- 4th axis

- Can be planned according to customer needs.