Research Institute of Tools Technology 2023

Nanjing Ningqing CNC Machine Tool Manufacture Co.,Ltd.
Hunan Ningqing Aerospace Intelligent Equipment Co.,Ltd.

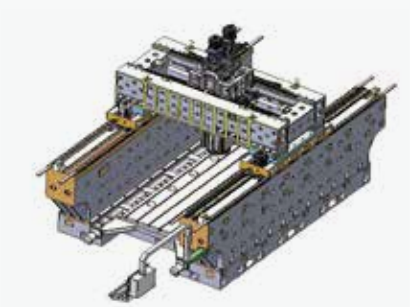
NingQing

Crossbeam Moving 5 axis Gantry Machining Center

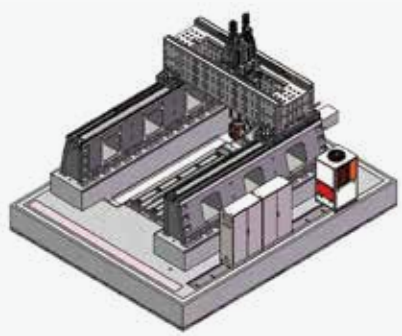


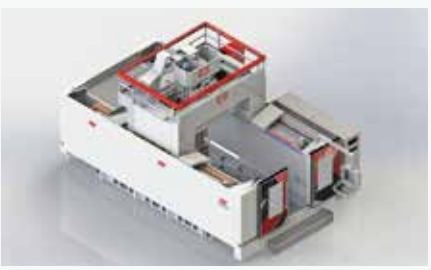
Since 2011

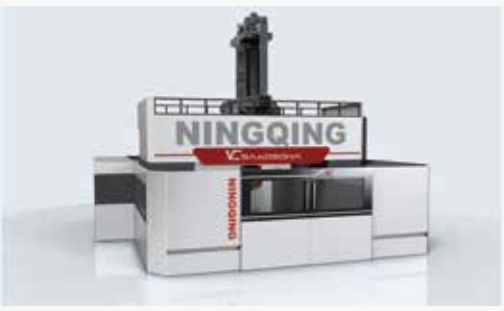
BMI5A One-body structure
16, 20 series



BMS5A Separate structure
25, 30 and etc series







BMI5A one-body 16, 20 series

Parameters	Unit	BMI5A3016	BMI5A3020
Worktable area	mm	3200×1600	3200×2000
Max. loading on worktable	t	20	30
X/Y/Z travel	mm	3200×1600×800	3200×2000×1000
Guide way		X: 2 linear guide way on each side, Y: 4 heavy-duty linear roller guide way, Z: 4 linear roller guide way	
Dist. from spindle nose to table surface	mm	280-1080 (customizable)	280-1280 (customizable)
Spindle		B head/standard, A, C head/optional	
Tool magazine capacity	position	20	
Max loading height	mm	1000 (customizable)	1000 (customizable)
Max loading width	mm	2000	
Feeding speed	m/min	0- 20	
Rapid speed	m/min	40/40/20	
Positioning accuracy	mm	0.01	
Repeat positioning accuracy	mm	0.005	
Weight of machine	t	40	42
Dimension (without electric cabinet)	mm	7400×4300×5500	7400×4700×6200
Control system		5-axis simultaneous standard Siemens ONE/Heidenhain	

BMS5A separate structure 25, 30 40 series

Parameters	Unit	BMS5A40/60/8025	BMS5A40/60/8030	BMS5A40/60/8035	BMS5A40/60/8040
Worktable area	mm	4000/6000/8000×2500	4000/6000/8000×3000	4000/6000/8000×3500	4000/6000/8000×4000
Max. loading on worktable	t	30/40/55	40/50/65	50/60/75	60/70/85
X/Y/Z travel	mm	4200/6200/8200×2500×1500	4200/6200/8200×3000×1500	4200/6200/8200×3500×1500	4200/6200/8200×4000×1500
Guide way		X: 2 linear guide way on each side, Y: 4 heavy-duty linear roller guide way, Z: 4 linear roller guide way			
Dist. from spindle nose to table surface	mm	150-1650 (customizable)			
Spindle		B head/standard, C, D head/optional			
Tool magazine capacity	position	20×1 unit (Max 20×4 units)			
Max loading height	mm	1500 (customizable)			
Max loading width	mm	3300	3800	4300	4800
Feeding speed	m/min	0-20			
Rapid speed	m/min	40/40/20			
Positioning accuracy	mm	0.01			
Repeat positioning accuracy	mm	0.005			
Weight of machine	t	60/75/95	63/78/98	67/82/102	70/85/106
Dimension (without electric cabinet)	mm	9090/11080/13080×6800×5600	9080/1080/13080×7300×500	9080/11080/13080×7800×5600	980/11080/13080×8300×5600
Control system		5-axis simultaneous standard Siemens ONE/Heidenhain			

Note: X travel can be increased by each 2 meters while more than 8 meters, Y travel can be increased by each 0.5 meters while more than 4 meters.

Main Components

SIEMENS 西门子

HEIDENHAIN 海德汉



Adopt the international well known brand tool setter



Adopt international famous brand optical scale

Numerical control system

1. The system uses the international advanced five-axis five-simultaneous CNC system, which has almost all the functions of the high-grade system, suitable for the control of various complex machining tasks, with excellent dynamic quality and control accuracy, and can make the machine achieve high speed machining under the premise of ensuring high quality machining accuracy.
2. RTCP function for 5-axis machining: The RTCP function (Rotating Tool Center Point) improves the quality of workpiece finishing by making the tool tip direction automatically follow the programmed contour trajectory, and by using the RTCP function, there is no need to consider tool length and tool direction when machining. If the tool direction is changed after the RTCP function is enabled, the CNC will automatically move the X, Y and Z axes to keep the tool tip the same contact with the workpiece.

   Using RTCP to machine a profile ensures that the tool direction is always perpendicular to the toolpath.

Dual Swing type AC head

AC head									Spindle						
Parameters	Head A		Head B (B1, B2, B3)		Head C		Head D		Parameters	A single/dual arm	B1 single/dual arm	B2 dual arm	B3 dual arm	C dual arm	D dual arm
	A axis	C axis	A axis	C axis	A axis	C axis	A axis	C axis							
Rotation range	±110°	±360°	±110°	±270°	±105°	±360°	±110°	±360°	Maximum power S6	30 Kw	55 Kw	67.5 Kw	65 Kw	76 Kw	51 Kw
Positioning accuracy	5″	5″	4″	4″	4″	4″	4″	4″	Rated torque S1	30 Nm	67 Nm	90 Nm	120 Nm	200 Nm	410 Nm
Repeat accuracy	4″	4″	2″	2″	2″	2″	2″	2″	Maximum torque S6	36 Nm	88 Nm	120 Nm	155 Nm	241 Nm	492 Nm
Rotational speed	30 rpm	30 rpm	30 rpm	30 rpm	30 rpm	30 rpm	60 rpm	60 rpm	Max grease speed	20000 rpm	/	18000 rpm	/	12000 rpm	8000 rpm
Rotational torque (max)	480 Nm	680 Nm	707 Nm (Single arm) 1414 Nm (Dual arm)	1250 Nm	1414 Nm	1250 Nm	2400 Nm	3000 Nm	Max oil & gas speed	24000 rpm/option	24000 rpm	/	15000 rpm	13000 rpm/option	8000 rpm
Clamping torque	1800 Nm	2000 Nm	2000 Nm	4000 Nm	2000 Nm	4000 Nm	6000 Nm	8000 Nm	Tapered shank	HSK A63	HSK A63	HSK A63	HSK A100	HSK A100	HSK A100

Note: A,B head by single-arm; C,D head by double-arm; Double-arm, A axis torque×2.



Single arm type



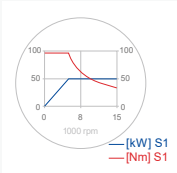
Dual arm type



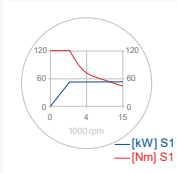
Head A



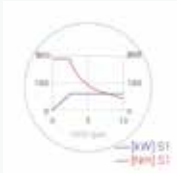
Head B1



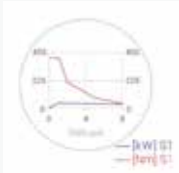
Head B2



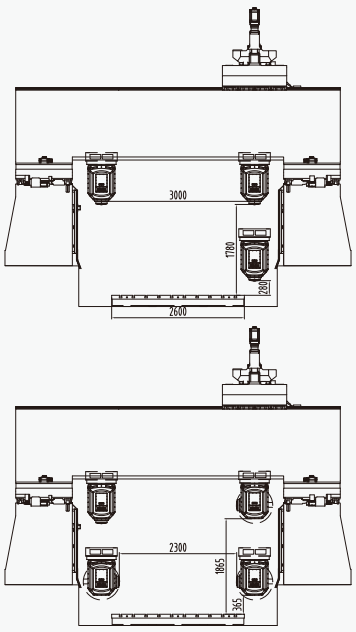
Head B3



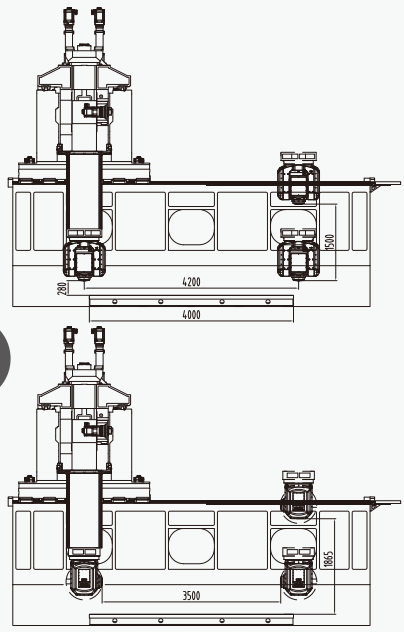
Head C



Head D



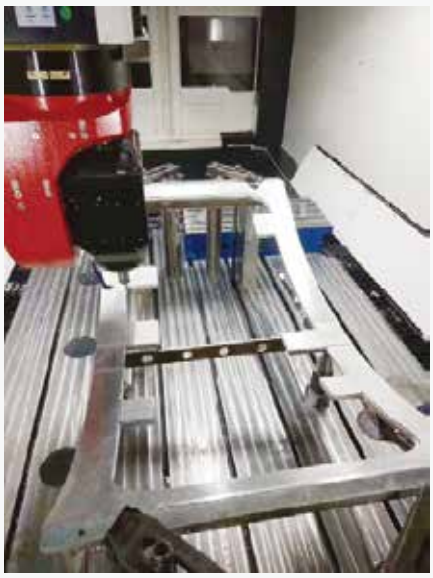
BMS5A4030 processing range diagram

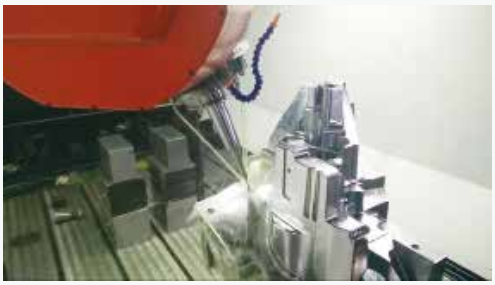


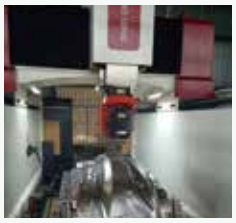
Case Showing











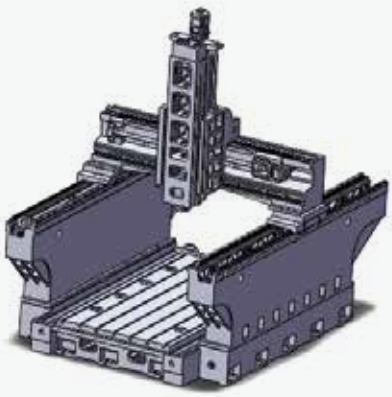

Crossbeam Moving Gantry Machining Center

▶ High speed, high precision, large load capacity, small footprint, high rigidity

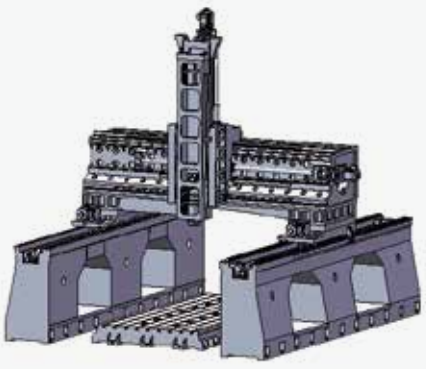
Since 2003



CMI one-body structure: 13 series



CMS separate structure: 25 , 30 series



BMI one-body structure: 16, 20 series

high processing speed
machining acceration up to **0.4G**





BMI Series

Parameters	Unit	BMI2515	BMI2516	BMI3016	BMI3020	BMI4016/6016	BMIXXX16
Worktable size	mm	2500×1600	2500×1600	3000×1600	3000×2000	4000/6000×1600	12,14,16,18,20 (table length increased by 2 m)×1600
Worktable load capacity	t	15	15	20	30	25/35	/
X/Y/Z travel	mm	2500×1500×800	2500×1600×600	3200×1600×600	3200×2000×600	4200/6200×1600×600	12200/14200/16200/18200/20200 (increase by 2 m) ×1600×600
Guide way		X: two on each side /total four linear rail in parallel distribution, Y: the upper and lower four lines of rail vertical distribution, Z: four roller linear rail four-way distribution.					
Dist. from spindle nose to table	mm	200-1000	80-680				
Spindle	mm	BBT50, 12000 rpm	HSK A63				
		18 Kw, 57 Nm	Siemens 25 Kw, 82.6 Nm (B1 head/standard, B2 head/optional)				
Max workpiece H×W	m/min	950×1900	600×1900	600×1900	600×2300	600×1900	600×1900
Rapid speed	mm	20				40/20/20	
Feeding speed	mm	0-15					
Positioning/repeat accuracy	mm	0.01/0.005					
Weight of machine	t	30	27	29	32	33/42	/
Size (without electric cabinet)	mm	6000×4300×4200	6000×4300×3700	6800×4420×3700	6800×4820×3700	8200/10200×4420×3700	/
Control system		Siemens 828D, Fanuc MF plus as standard,Siemens One as optional					

Note: 1. Standard tool magazine capacity is 20 bits, for double beam structure tool magazine need special customization
2. Install electric spindle as standard configure, also BBT50-155, 12000 rpm directly connected spindle (18 Kw, 57 Nm) for optional yet Y direction stroke shall be reduced by 100mm
3. For length 25/30 series adopts screw on X-direction, for 40 and above series on X-direction adopts double rack pinion elimination gap structure
4. For length 25 series adopts double spiral + rear chain plate chip conveyor, for 30/40/60 series adopts scraper chip discharge on both sides of the bed, and above 60 series use flushing chip on left and right of the bed + rear double scraper chip discharge.

High Speed Gantry Milling Center for Extra Long Job in Aerospace

BMS separate type: 25 ,30 and above series

high processing speed
machining acceration up to **0.4G**

Dual box-in-box crossbeam moving sigh speed gantry


BMS-L


BMS-H


BMS-HG



BMS Series

Parameters	Unit	BMS 25 series	BMS 30 series	BMS 35 series	BMS 40 series	BMS 50 series
Worktable length	m	14,16,18,20,22 (table length can be increased by every 2 meters)				
Worktable width	mm	2100	2600	3100	3600	4600
X travel	mm	4000, 6000, 10000, 14200, 16200, 18200, 20200, 22200 (X-directional travel increases by every 2 meters)				
Y travel	mm	2500	3000	3000	3500	4000
Linear guide way		X: 2 guide way/side×2 in parallel distribution, Y: 4 guide way in vertical distribution, Z: 4 roller guide way on four-way distribution				
Max workpiece width	mm	3160	3600	4100	4600	5600
Rapid/feeding speed	m/min	40/0-20				
Positioning/repeat accuracy	mm	0.01/0.005				
Tool magazine capacity	position	20				
Control system		Siemens 828D, Siemens ONE				

Parameters		BMS-HG	BMS-H	BMS-L
Z travel	mm	600	1200	1200
Dist. from spindle nose to table	mm	100-700 (customizable)	350-1550 (customizable)	350-1550 (customizable)
Electric spindle		C1 head, C2 head/optional	B1 head, C2 head/optional	B1 head, C2 head/optional
Max loading height	mm	650 (customizable)	1550 (customizable)	1550 (customizable)

Note: The table length and X-axis stroke of the extra-long series models are increased by every 2 meters, and the table width and Y-axis stroke are increased by every 0.5 meters, model number changed accordingly.

8M and above gantry adopt gear and racks driving structure

More than 8 meters travel adopt gear and rack structure. High precision, large modulus grinding gear and rack with heavy duty capacity and high positioning accuracy.



Four servo motors simultaneously driving control in the same direction to eliminate anti-backlash.







CMI one-body structure

Parameters	Unit	CMI1813		
Worktable	mm	1900×1300		
Max. worktable loading	t	9		
X/Y/Z travel	mm	2000×1300×550		
Guide way		X: 4 linerail on two sides,Y: 2 linear rail vertical distribution+box rail, Z: 4 roller linear rail four-way distribution		
Dis. from spindle nose to table surface	mm	230-780 (customizable)		
Spindle		Electric spindle can be installed	Directly connected spindle and motorcan be installed	
		Standard A head, optional B1 head	BBT40-150-15000 rpm	BBT50-155-12000 rpm
			18 Kw, 57 Nm	
Max loading height×width	mm	660 (Customizable)×1550		
Rapid/feeding speed	m/min	30/0-15		
Positioning accuracy/repeatibility	mm	0.01/0.005		
Weight of machine	t	15		
Dimension (without electric cabinet)	mm	4800×3400×2900		
Control system		Siemens 828D, Fanuc MF plus, optional: Siemens ONE		

Note: Standard tool magazine capacity is 20 positions.

CMS separate structure 25, 30 and and bove series

Parameters	Unit	CMS4025	CMS6025	CMS6030	CMS8030	CMSXXX35
Worktable area	mm	4000×2100	6000×2100	6000×2600	8000×2600	XXX×3100
Max worktable loading	t	30	40	50	65	/
X/Y/Z travel	mm	4950×2500×1200	6950×2500×1200	6950×3000×1200	8950×3000×1200	/
Guide way		X: 2 linear guide way×2, Y: 2 linear guide way, Z: 4 rolller linear guide way				
Dist. from spindle nose to table	mm	350-1550 (customizable)				
Spindle		BT50-190-6000/belt, BT50-190-8000 with gearbox/optional				
		Siemens: 28/42 Kw (rated 1000 rpm), 267.5/401 Nm (1070/1604 Nm with gear box/optional)				
Spindle (optional)		Built-in short direct connection BT50-190-6000, gearbox				
Max loading height×width	mm	1500 (customizable)×3160		1500 (customizable)×3600		
Rapid/feeding speed	m/min	20/0-15				30/0-15
Positioning/repeatability accuracy	mm	0.01/0.005				
Machine weight	t	60	75	78	102	/
Dimension (without electric cabinet)	mm	9080×6320×5750	11080×6320×5750	12020×6820×5750	13020×6820×5750	/
Control system		Siemens 828D, Fanuc MF plus, optional: Siemens ONE				

Note: Standard tool magazine capacity is 20 positions ×1 unit, with optional up to 20 positions ×4 units.

Main Components of G Type High Speed & Precision Machine

SIEMENS 西门子

HEIDENHAIN 海德汉

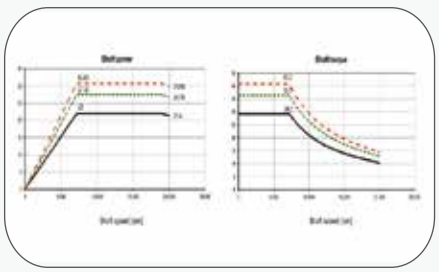


Adopts international famous brand tool setter

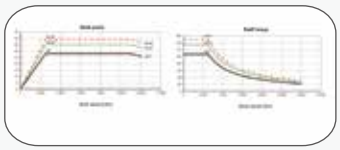


Adopts famous brand laser optical scale

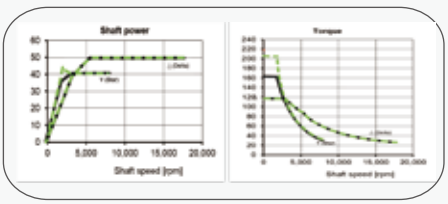
High-speed electric spindle



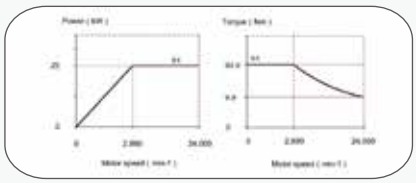
A. 22/31 kw，29.2/41 Nm，HSK-A63-20000/24000 rpm



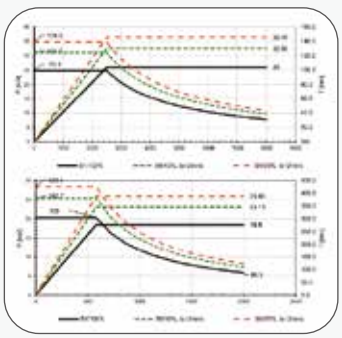
B2. 28/35 kw，108/150 Nm，HSK-A100-12000 rpm



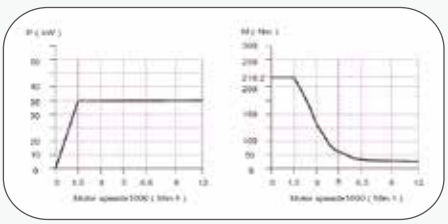
C1. 40/50 kw，170/118 Nm，HSK-A63-18000 rpm



B1. 25 kw，82.6 Nm，HSK-A63-24000 rpm



D. 18.5/26 kw，99.3/305 Nm，BT50-8000 rpm



C2. 35 kw，210.2 Nm，HSK-A100-12000 rpm

Technical Advantages

The effect of motion quality on servo

The motion mass has an essential impact on the servo inertia. If the motion mass changes, then the inertia must change, that is, the electrical accuracy parameters must change, and the parameters of the machine tool, when it leave facotry, are set based on the load when commissioning. Once the motion mass has changed after it leave the factory, then the servo load also changes, but generally the user can not adjust these parameters at this time, which directly lead to electrical Accuracy reduction, therefore can not process high-precision workpiece. Please note that this refers to the high precision instead of pint to point movement (two-dimensional)accuracy, but refers to the interpolation accuracy or contour accuracy. Due to parameters do not adapt caused by changes in load, the degree of finish must deteriorate, resulting in machine tools can not do high-speed high-gloss processing. Therefore, the beam moving machine has a very high advantageous performance, thus international main stream gantry machine tools also use this structure. However, it should be noted that the gantry moving machine tool (also known as moving column type,) due to a large torque between the center of gravity of movement and support point (slider below column) exist, there is a large overturning force generate when doing high acceleration movement, which will lead to overcutting phenomenon. While once lower acceleration adopted, not only makes the movement low efficiency, but also can not get good contour accuracy and finish, but this type of machine can be used in the point movement workpiece processing, which can process major workpiece and get good accuracy and precision retention.

Can fully closed loop adopted solve the accuracy problem?

As mentioned above, since the table-moving machine tools (here refers to medium-sized machine tools)cannot get same stable and reliable accuracy and finish as the beam-moving machine tools, can the use of fully closed-loop solve it? The answer is no. Admittedly, fully closed loop can improve the accuracy of the machine, but it should be pointed out that the accuracy here refers to the position loop accuracy, not the speed and current loop accuracy, so in the point to point processing, fully closed loop can improve machining accuracy, but in the interpolation movement, to get good contour accuracy and finish it is mainly dependent on the speed and current loop and other electrical parameters to match and get a good fully closed loop circular. Therefore, fully closed-loop is not an effective solution. It should also be noted that if the machine tool itself is not rigid and accurate, the use of fully closed-loop can even lead to vibration, which further deteriorates the accuracy and finish of the machine tool.

Case Showing





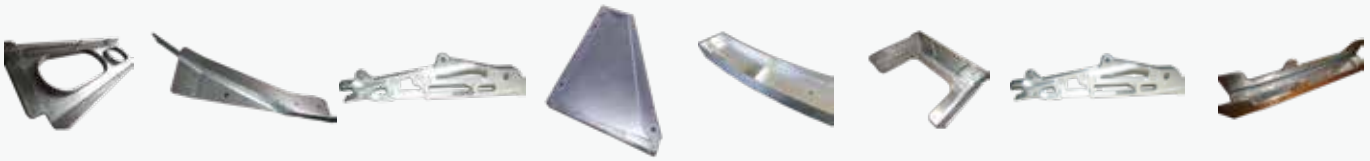










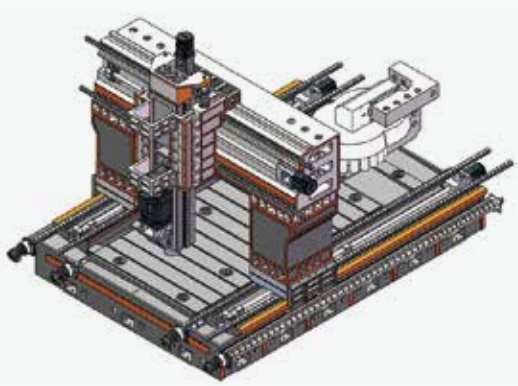




Column Moving Grantry Gantry Machining Center Series

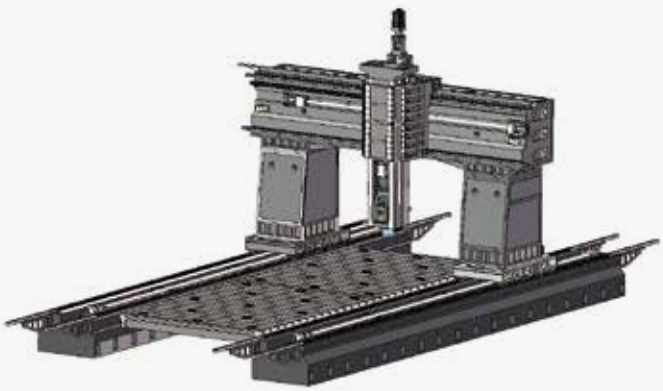
▶ **Solutions of heavy duty machining for extra size/weight workpieces**



GMI one-body structure



GMS separate structure



GMI One-body structure 12, 16, 20,25 series

Parameters	Unit	GMI2012	GMI2516	GMI3020	GMI4025
Worktable	mm	2000×1000	2500×1400	3000×1800	4000×2300
Max loading on table	t	12	15	30	35
Y1/Y2 travel	mm	1200/1700	1600/2100	2000/2500	2500/3000
X/Z travel	mm	2000×700	2500×800	3200×1000	4200×1000
Guide way		X: 2 linear rolling guide+1 box guide, Y: 2 linear rolling guide×2+box guide×2, Z: 2 linear rolling guide+1 box guide			
Dist. from spindle nose to table	mm	300-1000	200-1000(customizable)	200-1200 (customizable)	
Spindle speed	rpm	BT50-8000, 1:4 high-speed gearbox/optional			
Spindle motor		2012: 15/22.5 Kw (rated 1500 rpm) 96/144 Nm (384/576Nm); 2516: 17/25.5 Kw rated 1000 rpm 162/243 Nm (648/972 Nm); 3020/4025: 22/30 Kw, 210/315 Nm (840/1260 Nm)			
Tool magazine capacity	position	Disc 24			
Max. loading width (above guide way cover)	mm	1200	1600	2000	2500
Rapid/feeding speed	m/min	15/0-15			
Positioning/repcatability accuracy	mm	0.01/0.005			
Machine weight	t	16	20	32	37
Dimension (without electric cabinet)	mm	5400×4500×3200/3900	6100×4700×3700/4500	6700×5200×4200/5200	7800×5800×4200/5000
Control system		Siemens 828D, Fanuc Oi MF plus, optional: Siemens ONE			

GMS Separate structure 30,35 Series

Parameters	Unit	GMS60/80-30	GMS60/80-35	GMSXXX35
Worktable area	mm	6000/8000×2100	6000/8000×2600	XXX×2600
Max loading on table	t	38/60	50/65	/
Y1/Y2 travel	mm	3000/3500	3500/4000	
X/Z travel	mm	6200/8200×1200	6200/8200×1200	/
Guide way		X: 2 linear rolling guide way+1 box guide way, Y: 2 linear rolling guide way×2+box guide way×2, Z: box guide way		
Dist. from spindle nose to table	mm	350-1550, 350-1850/optional		
Spindle	rpm	Built-in short direct motor BT50-6000 rpm, BT50-8000 rpm, BT50-3000 rpm (roller bearing), BT60-2000 rpm with gearbox/optional CTS function for optional only suit for long direct connection structure		
Spindle motor		30/35 series: Standard28/42 Kw (rated 1000 rpm) 268/401 Nm (two-speed gearbox 1070/1604 Nm) Optional: 35/52.5 Kw (rated 700 rpm), 418/717 Nm (two-speed gearbox 3000 Nm)		
Tool magazine capacity	position	Disc 24 position/Chain style tool changer		
Distance between columns	mm	3000	3500	
Rapid traverse/feed speed	m/min	15 (screw driven) 20 (rack driven)/0-10		
Positioning accuracy/repeatability	mm	0.01/0.005		
Machine weight	t	50/65	58/70	/
Dimension (without electric cabinet)	mm	11650/13650×6850×5200	11650/13650×7750×5200	/
Control system		Siemens 828D, Fanuc 0i MF plus, optional: Siemens ONE		

Note: Adopts screw-nut transmission for up to 6 meters on X direction, double rack and pinion backlash elimination structure for 8 meters and above.

8M and above gantry adopt gear and racks driving structure

More than 8 meters travel adopt gear and rack structure. High precision, large modulus grinding gear and rack with heavy duty capacity and high positioning accuracy.



Four servo motors simultaneously driving control in the same direction to eliminate anti-backlash.





GMS Ultra-wide 40, 50, 60 and above series

Parameters	Unit	GMS60/80-40	GMS60/80-50	GMS80/100-60	GMSXXX50
Worktable area	mm	6000/8000×3100	6000/8000×4100	8000/10000×5100	XXX×4100
Max. loading on worktable	t	48/75	68/88	100/125	/
Y travel	mm	4000/4500	5000/5500	6000/6500	5000/5500
X/Z travel	mm	6200/8200×1200	6200/8200×1200	8200/10200×1200	/
Guide way		X: Both sides precision synchronous drive, both sides are two linear guide plus rectangular rail support, Y: Dual linear rail supplemented by hard guide vertical distribution as strong support, Z: Hardened square ram hard rail			
Spindle nose to table surface	mm	350-1550, 350-1850/optional			
Spindle drive mode	rpm	Standard built-in short direct drive BT50-6000+two-speed gearbox (BT50-3000 roller bearing/BT60-2000 roller bearing)/optional upper long direct drive+CTS			
Spindle motor		28/42 Kw (rated 1000 rpm), 268/401 Nm (1070/1604 Nm/with gearbox for optional). 33/50 Kw (rated 700 rpm)+gearbox 3000 Nm/optional			
Tool magazine capacity	position	24 (disc/storage)			
Distance between column	mm	4000	5000	6000	5000
Rapid/feeding speed	m/min	15/0-10			
Positioning accuracy/repeatability	mm	0.01/0.005			
Machine weight	t	58/75	68/80	85/100	/
Dimension (without electric cabinet)	mm	11650/13650×7350×5200	11650/13650×8350×5200	13650/15650×9350×5200	/
Control system		Siemens 828D, Fanuc 0i MF plus, optional: Siemens ONE			

Note: The table length and Y-axis stroke of extra-wide series models will be increased by 1 meter each, and the model number will be changed accordingly.
Double rack and pinion backlash eliminated structure is adopted for 6 meters and above on Y direction.

8M and above gantry adopt gear and racks driving structure

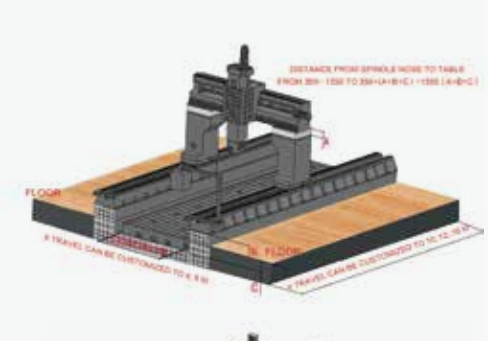
More than 8 meters travel adopt gear and rack structure. High precision, large modulus grinding gear and rack with heavy duty capacity and high positioning accuracy.

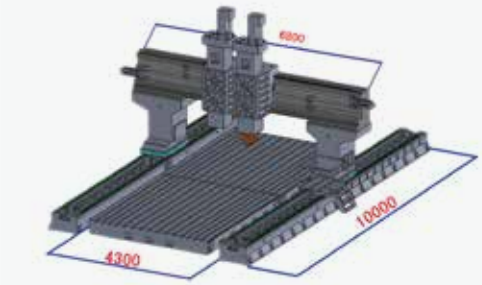


Four servo motors simultaneously driving control in the same direction to eliminate anti-backlash.

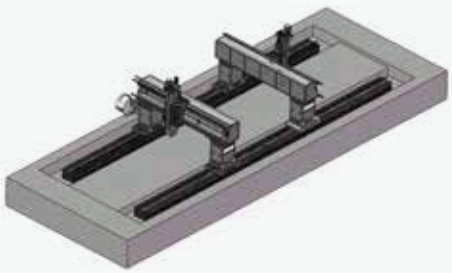


Development of the Custom-built Gantry Machining Center









Optional Parts


Auto universal milling head


Auto right angle milling head


Universal milling head/45°


Universal milling head/90°


Right angle milling head


Lengthen milling head


Warehousing ATC

Cace Showing















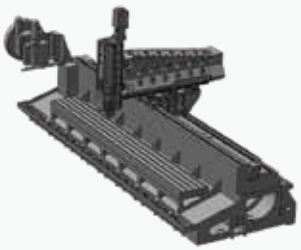


Column Moving Vertical Milling Center

High speed and high precision machining of aerospace long truss parts

RMC455





RMC665



Difference between cast and welded structures

Castings body are generally used for traditional machine tools as castings have good resistance to pressure, vibration absorption and stability. The stress can effectively be released as long as after reasonable aging treatment, to ensure the long-term accuracy of the machine tool. The welded bed as a lightweight design, are also commonly used in worldwide, but the welded bed requires a good anti-deformation structural design, complex aging treatment, and suitable processing technology, otherwise the accumulated stress in the structure will slowly release, resulting in the gradual deformation of the machine tool. In order to reduce costs and improve the efficacy, many domestic machine tool companies mislead domestic consumers by stealing the concept of high-grade welded bed. For high-speed machines are of high speed and high acceleration, the body needs to withstand higher impact, so it is still necessary to use better casting structure for structural strength and vibration-absorbing .

Characteristic

1. The machine adopts full casting structure with strong vibration absorption and high accuracy retention.
2. RMC55 series adopts ram moving structure, which replaces the traditional column moving type and solves the problem of column moving type affecting the accuracy.
3. RMC65 series column adopts gantry structure with large support area and strong structural rigidity, which can realize fast movement in Y direction, avoiding the disadvantages of slow Y-directional movement and gravity center shifting of traditional column moving type.
4. RMC65 series Z-axis adopts four 45mm roller linear rails, distributed in four directions, with strong rigidity, fast speed and high precision.
5. The X-way slide adopts layout of the linear rail base with drop height, which effectively improves the cutting resistance.
6. The adopted system head can make linear movement parallel to the X direction, and it adopts 45mm linear guide as support, which is convenient for tool setting and operation when machining long workpieces.
7. The bed and table are of one-piece structure with rigidity and stability.
8. This machine is especially suitable for machining long workpieces, and it can also be divided into machining areas for machining and clamping on different area at same time, realizing the function of exchangeable table, and solving the problem of table accuracy decline after long-term use of exchangeable.
9. It adopts imported high-precision ground rack and pinion drive on X-direction with high precision and fast speed.
10. The machine adopts a fully enclosed telescopic cover to prevent cutting chips and fluid from splashing and can be effectively collected to protect the environment effectively.

Parameters	Unit	RMC665/865/1265	RMC455/655/855/1255	Parameters	Unit	RMC665/865/1265	RMC455/655/855/1255
Worktable	m	0.6×6/8/12	0.5×4/6/8/12	Feeding speed	m/min	0-15	0-20
T-slot	mm	5×18		Rapid speed	m/min	60/30/30	
Table load	t	10/12/20	4/6/8/12	Tool magazine capacity	position	24	
X travel	m	6/8/12	4/6/8/12	Tool exchange time	s	4	
Y/Z travel	mm	600×500	500×450	Positioning accuracy	mm	0.01	
Guide way		3 axes linear guide, 4 rollers in Z axis		Repeat accuracy	mm	0.005	
Spindle nose to table	mm	150-650	100-550	Machine weight	t	32/38/46	20/25/30/38
Spindle taper		BT50, BT40/optional	HSK A63, BT40/optional	Dimension	m	9.5/11.5/15×3.5×3.5	6.5/9/11/15×3.4×3.4
Spindle speed	rpm	8000, 10000/optional	18000, 12000/optional	Total power	Kw	34	25
Spindle motor	Kw	17/25.5 Kw, 162/243 Nm	11/18.5 Kw, 9/12 Kw/optional	Control system		Siemens 828D, Fanuc 0i MF	

Vertical Machining Center



Since 2003

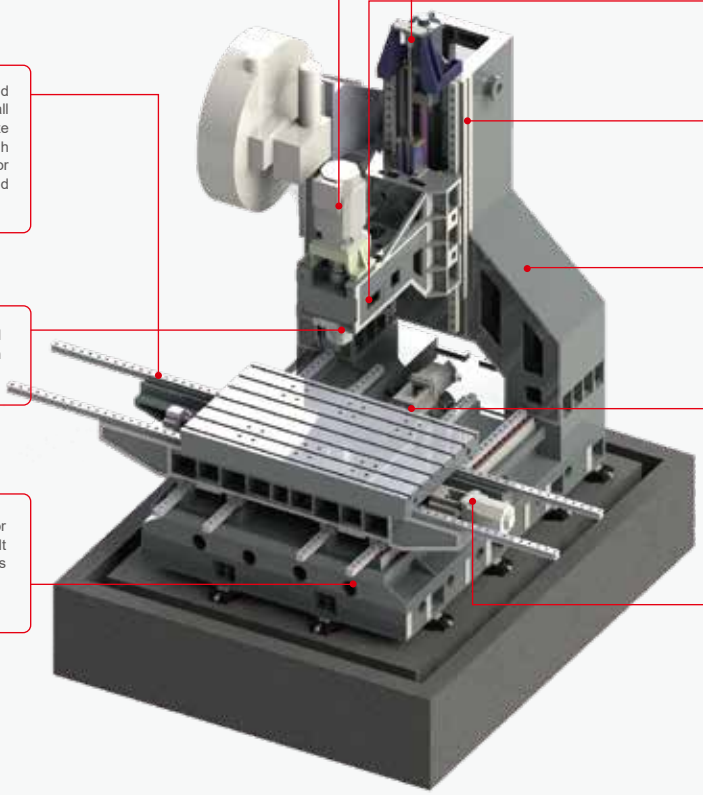
48m/min High speed, steel parts cutting 5mm

1.It adopts pneumo-hydraulically balance on Z axis with high speed dynamic response to meet high speeed machining.(standard on VC1160/VC1270)

2.It adopts famous brands high speed and high precision heavy-duty linear rail for all machine models, and adopts large size roller rail to ensure big cutting volumn, high precision, high speed and high rigidity for mass production and high precision mold machining.

3.Adopt high quality spindle from Taiwan and P4 grade spindle bearing from Japan with stable, high precision and durable.

4.It adopts rear flush chip conveyor for 855/1160, and front flush for 1270. It adopts high pressure flushing nozzle as standard configue for rapid chip flushing（1160/1270).



5.Optional direct-drive spindle or electric spindle (up to 18,000rpm), optional coolant through spindle .

6.It adopts water cooling spindle box, which can effectively take away the heat of the spindle and partially replace the spindle oil cooler, which is enviroment friendly and energy saving. (VC1160/ 1270 standard configure.

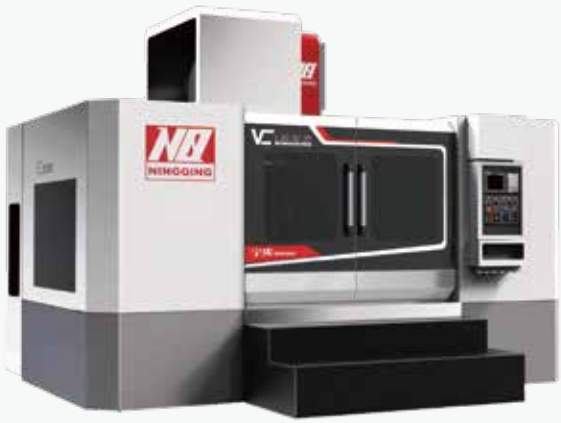
7.Mounting base for fully closed-loop optical scale is available for easy upgrade in furture.

8.Rock-solid large span column, can withstand the large inertia generated by high-speed movement, the base width 855:1000mm, 1160:1200, 1270:1200, and1585:1860mm.

9.Famous brand high speed and high precision ball screw are adopted, diameter : 40mm for VC855 / VC1160, 50mm for VC1270.

10.Adopt Japan-made P4 grade ball screw special bearings with high precision and long life.





Parameters	Unit	VC855	VC1160	VC1270	VC1585
Worktable area	mm	500×1000	600×1100	710×1300	900×1600
T-slot	mm	5×18	5×18	5×18	7×18
Table loading	Kg	600	800	900	1500
X/Y/Z travel	mm	860×550×560	1080×630×600	1200×700×600	1500×850×700
Linear guide way	mm	X: 35, Y: 45, Z: 35/roller	X: 35, Y: 45, Z: 45/roller	X: 45, Y: 55, Z: 55/roller	X: 55, Y: 55, Z: 55/roller
Spindle nose to table	mm	110-670	150-750	150-750	200-900
Spindle center to guide way	mm	580	650	810	1000
Spindle speed	rpm	10000/belt, 12000, 15000/direct, 18000/24000 (HSK A63)/electric spindle		8000/belt, 10000/direct, 18000/24000 (HSK A63)/electric spindle	
Spindle taper		BT40-150/BBT40	BT40-150	BT40-150/BT50-155	BT50-155
Spindle motor	Kw	Siemens: 9/13.5, Fanuc: 7.5/11	Siemens: 9/13.5, Fanuc: 11/15	Siemens: 12/18, 115/172 Nm, Fanuc: 15/18.5	
Feeding speed	m/min	48	48	32	20
Rapid speed	m/min	48	48	32	20
Tool magazine capacity		24			
Tool change time	s	1.8			
Positioning accuracy	mm	0.01			
Repeatability accuracy	mm	0.005			
Machine weight	Kg	5500	6500	8800	12000
Dimension	mm	2600×2200×2600	2950×2550×2600	3450×2800×2700	4300×3200×3000
General power capacity	Kw	22	25	30	35
Control system		Siemens, Fanuc			

Cutting efficiency: 45# steel VC855: 200 mm^3/min, VC1160: 250 mm^3/min, VC1270: 320 mm^3/min
Aluminum parts VC855: 1000 mm^3/min (high speed), VC1160: 1100 mm^3/min, VC1270: 1300 mm^3/min

Horizontal Machining Center



Characteristic

1.High spindle power, strong cutting force, suitable for low-speed machining of cast iron and steel parts, especially for large molds;

2.Large stroke and wide range of processing;

3.Enables the machining of four sides in once clamping after additional adding CNC rotary table;

4.Can achieve ultra-precision machining requirements if adding Fagor high-speed precision scale.





With large cutting and high precision, it is an ideal machine to replace imported horizontal machining centers and for mass production.

Parameters	Unit	HC500	HC630	HC800	HC1000	HC630 (2 pallets)	HC800 (2 pallets)
Worktable area	mm	500×600	630×700	800×800	1000×1000	630×700	800×800
Table Indexing		1°					
T-slot	mm	5×22	5×22	5×22	5×22	5×22	5×22
Indexing accuracy		10″					12″
Table Load	Kg	750	1000	1500	2000	950	1500
X/Y/Z travel	mm	800/700/750	1050/750/900	1300/1000/1000	1600/1000/1000	1050/750/900	1100/850/900
Guide way		roller guide way					
Spindle center to table surface	mm	120-820	120-870	120-1120	120-1120	0-750	0-850
Spindle nose to table	mm	130-880	130-1030	200-1200	200-1200	130-1030	180-1080
Spindle taper		BT50					
Spindle speed	rpm	6000					
Spindle motor	Kw	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5
Feeding speed	m/min	10	10	10	10	10	10
Rapid speed	m/min	30	30	24	24	24	24
ATC capacity/ tool change time		30T/5.5S	30T/5.5S	40T/5.5S	40T/5.5S	40T/5.5S	40T/5.5S
Positioning accuracy	mm	0.01	0.01	0.01	0.01	0.01	0.012
Repeatability	mm	0.008	0.008	0.008	0.008	0.008	0.01
Machine weight	t	11	12	17	18	14	18
Dimension	mm	3500×6000×3000	3500×6000×3000	4800×6400×3900	4800×6400×3900	3500×7500×3000	5500×8000×3000
Control system		Fanuc 0i MF3 Plus/Siemens					

High Speed Machining Center For Long Workpiece



Characteri stic

1.Full casting body, good rigidity and stability.

2.The ram moves at high speed with better stability than that of column movement.

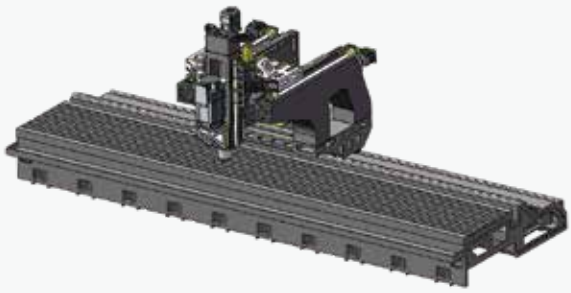
3.X-directional slide plate are in step arrangement substantially increases the machine's overall strength.

4.Skeletonized table facilitates chip removal

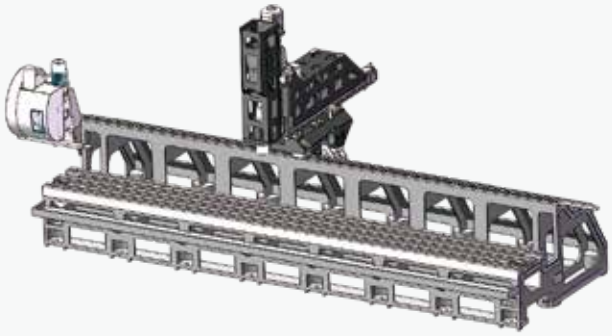
5.The sheet metal is reasonably designed to effectively prevent aluminum chips and cutting fluid from splashing during high-speed processing, which meets environmental protection requirements.

6.X65 series X-direction adopts double gantry structure with large support area and strong structural rigidity, which can realize fast movement in Y direction, avoiding the disadvantages of slow movement and shift of gravity center existed in Y-direction of traditional column moving type. Y most distal end is strong in rigidity and high in precision compared with single-arm gantry structure.

7.All three axes guide rails adopt Japanese THK heavy-duty linear guide rails, and the gear rack and reducer adopt German Alfa high precision gear rack.



X105 Series



X65 Series

Parameters	Unit	LQRX65	LQRX105	Parameters	Unit	LQRX65	LQRX105
Worktable	mm	5500/7500/11000/13000×15000×600	6500/8500/13000/15000/17000×1000	Dimension	m	6/8/11.5/13.5/15.5×2.2×2.8	7/9/13.5/15.5/17.5×2.6×2.8
T-slot	mm	4×18	6×18	Feeding speed	m/min	20	
Table loading	t	0.8/1/1.6/1.8 /2	0.8/1/1.6/1.8/2	Rapid speed	m/min	40/30/30	
X travel	mm	4500/6500×10000/12000/14000	4500/6500/11000/13000/15000	Tool magazine		24	
Y/Z travel	mm	600×500	1000×500	Tool change time	s	4	
Guide way		3 axis linear guides with 2 rollers/Z	3 axes linear guides, 4 rollers/Z	Positioning accuracy	mm	0.02	
Spindle nose to table	mm	80-580	150-650	Repeatablity	mm	0.01	
Spindle taper		BBT40		Machine weight	t	16/19/25 /28 /32	23/28/38/43/48
Spindle speed	rpm	15000 (direct connection)		General power	Kw	22	
Spindle motor power	Kw	8.4		Control system		Siemens, Fanuc 0i MF	

Light-duty 5 Axis Gantry Machining Center

For processing composite material in aviation



0.5MPA High pressure Vacuum dust cleanning on tool end

Characteristic

1.Double gantry structure, especially suitable for high-speed movement.
2.All-cast body, good rigidity and stability.
3.Adopt Japanese THK heavy-duty linear guide for all the three axes linear rails , and adopt German Alfa high-precision gear rack for the gear rack and reducer.
4.This series of machine tools can be used for aerospace composite material processing, with double layer area dust remove, which first layer is vacuuming inside the door frame, and the second layer is closed vacuuming for the whole machine, with good effect of dust absorption.



Dual-Arm Type

Parameters	AC Head		Spindle	
	A-axis	C-axis	Rated power S1	15 Kw
Rotation range	±120°	±245°	Max Power S6	18 Kw
Positioning accuracy	30"		Rated torque S1	19.1 Nm
Rotational speed	270°/sec		Max torque S6	20.9 Nm
Rotation torque (continuous)	400 Nm	500 Nm	Rated speed	9000 rpm
Rotation torque (max)	1000 Nm	1200 Nm	Maximum speed	24000 rpm
			Tapered shank	HSK A63
Clamping torque	600 Nm		Bearing lubrication	oil & grease

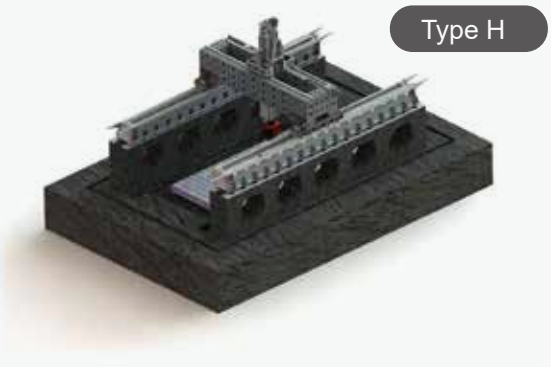
High Speed Light-duty Gantry Machining Center

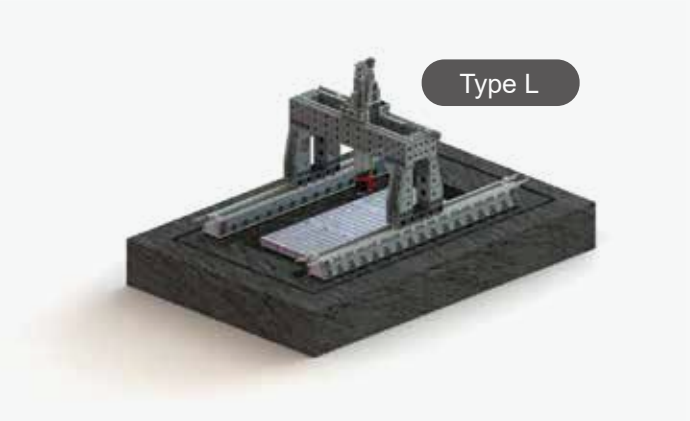
Effective Tool for New energy car battery box



Parameters	Unit	LQI2520	LQI5A3020	Parameters	Unit	LQI2520	LQI5A3020
Worktable	mm	2500×1800	3000×1800	Feeding speed	m/min	20	20
T-slot	mm	9×18	11×18	Rapid speed	m/min	40/30/20	40/30/20
Table loading	t	10	10	Tool magazine	positioin	24	20
Y travel	mm	2000	2000	Tool change time	s	4	4
X/Z travel	mm	2500×450	3200×800	Positioning accuracy	mm	0.02	0.02
Guide way		3 axis: linear guide way, Z axis: two rollers		Repeat positioning accuracy	mm	0.01	0.01
Spindle nose to table	mm	180-630	250-1050	Machine weight		13	25
Spindle taper		BBT40	HSK A63	Dimension	m	5.25×4.16×3.3	7×5.1×4.4
Spindle speed	rpm	15000 (direct connection)	24000	Total power	Kw	22	55
Spindle motor	Kw	8.4	15/18	Control system		Siemens 828D/ONE, Fanuc 0i MF	

Crossbeam Moving Light Duty Gantry Series





LQS Series

Parameters	Unit	LQS5AXX25H/L	LQS5AXX30H/L	LQS5AXX40H/L
Length of worktable	mm	4, 6,10,12 (table length can be increased by 2 m)		
Width of worktable	mm	2100	2600	3600
X travel	mm	4200, 6200, 10200, 12200 (increase by 2 m)		
Y/Z travel	mm	2500×1500	3000×1500	4000×1500
Guide way		X: 2 linear guides×2 in parallel distribution Y: 4 linear guides in vertical distribution Z: four roller linear guides 4-way distribution		
Spindle nose to table	mm	200-1700 (customizable)		
Spindle can be installed		A head, B1 head/optional		
Tool magazine capacity		20, Max: 20×4 units/optional		
Max loading height	mm	1600 (customizable)		
Max loading width	mm	3100	3600	4600
Rapid speed	m/min	30/20/20		
Feeding speed	m/min	0-15		
Positioning accuracy		0.01		
Repeat positioning accuracy		0.005		
Dimension: L (without clectric cabinet)	mm	9m, 11m, 15m, 17m (increase by 2 m)		
Dimension: W×H (without electric cabinet)	mm	6000×6500	6500×6500	7500×6500
Control system		Sicmens 828D for 3+2 type/Siemens ONE for 5-axis simultancous as standard		

Note: The whole grouting concrete structure under the rail seat for Type H, Heightened column structure for Type L.



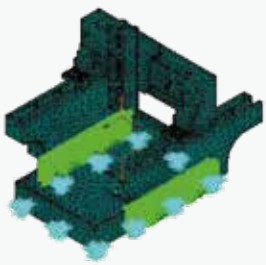
3D additive/subtractive hybrid 5-axis machining center



Some Customers

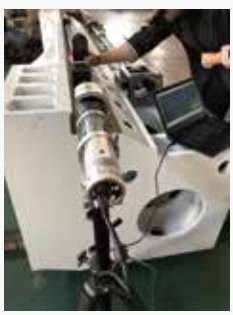
Quality Assurance

Each CNC machine tool is carefully inspected by four parts of more than seventy major items, nearly four hundred small items.



Finite element analysis

Cooperates with famous universities in China on machine tool design and adopts the international advanced finite element analysis to ensure reasonable dynamic and static characteristics of the machine, reasonable & evenly distributed load.



Collimator



Vibrator



Three axes laser inspection

Each machine of NINGQING is calibrated with RENISHAW laser interferometer to accurately compensate for pitch error, backlash, positioning accuracy, repeat positioning accuracy, etc. to ensure the dynamic and static stability and machining accuracy of the machine.



Bar ball inspection

Each machine uses RENISHAW ballbar to calibrate the true circle accuracy and the geometric accuracy of the machine, and also conducts circular cutting test to ensure the 3D machining accuracy and circle accuracy of the machine.

The technical parameters and configurations described in this catalogue are for model selection reference only, see the technical contract for specific configurations

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