

蕙勒 US WHEELER

Industrial Robot + CNC Machinetools + Intelligent Factory

杭州蕙勒智能科技股份有限公司

HANGZHOU WHEELER GENERAL MACHINERY INCORPORATED CO.,LTD

LM Series

GANTRY MACHINING CENTER



US WHEELER

蕙勒

INDUSTRIAL ROBOT/CNC
MACHINETOOLS/INTEL-
LIGENT FACTORY

ABOUT US

Hangzhou Wheeler General Machinery Incorporated Co., Ltd. is a national high-tech enterprise specializing in CNC machining equipment, automatic machine tool loading and unloading, digital factories, and non-standard fixtures design and manufacture. The company was established in January 2015, and is located in Linping District, Hangzhou City. The company has more than 300 employees, and an efficient professional technology research and development team, including more than 60 professional and technical personnel with various intermediate and senior technical titles (engineers). The company has a 5,000-square-meter R&D center and a 43,000-square-meter production and debugging base, and has more than 50 patented technologies. There are offices and after-sales service outlets in 22 prefecture-level cities in China, as well as professional agency partners and service outlets in Turkey, Russia, Egypt, South Africa, Brazil, Australia, Singapore, Malaysia, Thailand and other countries.

Certification system we have passed



Wheeler is currently a strategic partner of robotics companies such as KUKA(Germany), ABB(Switzerland), CNC system companies such as Fanuc, Mitsubishi(Japan), Siemens(Germany). We provide customers with mechanical mechanical processing automation technology scheme design, a full set of automation equipment, technical consultation, and perfect after-sales and technical services. The company's products are widely used in mass production industries such as auto parts processing and construction machinery.



GANTRY SERIES MACHINING CENTER



Gantry Series

The Z-axis uses nitrogen hydraulic counterweight to ensure accurate and reliable balance quality.

The X/Y axis uses roller sliders, and the Z axis uses roller sliders or hardrails, which greatly increases the load carrying capacity and improves the positioning accuracy repeatability accuracy and rigidity of the machine tool.

The workbench is supported throughout the entire stroke, sharing the load evenly, with low wear and ensuring that the workbench is not suspended or deformed.

The crossbeam linear rail adopts non-co-directional arrangement and widened box structure slide seat, which greatly improves the rigidity of the Y-axis and improves the cutting ability.

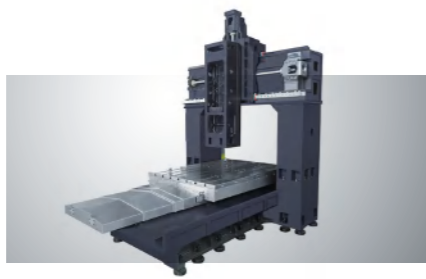
The enlarged crossbeam contact area effectively avoids vibration caused during processing.

The lubrication of the machine tool adopts a volumetric system, with regular and quantitative automatic centralized oil supply lubrication to ensure that the lubricating parts are fully lubricated.



+ Tool magazine

Equipped with an ATC tool magazine, the tool changing time is short, the tool repeatability positioning accuracy is high, the tool storage capacity is sufficient, and it takes up less space.



+ Body structure

The over-heavy load-bearing machine body structure is supported by oversized columns and horizontally dyed box structures (the bottom rail support is strengthened). The machine head ribs are completely arranged. The whole machine has good rigidity and can realize heavy-duty cutting of large workpieces and molds.



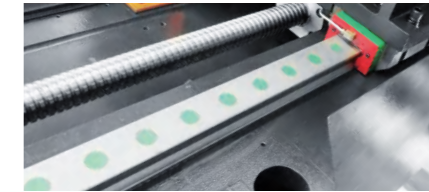
+ The bed

The bed adopts the design which can effectively reduce the center of gravity of the machine tool and further enhance the stability of high-speed movement of the machine tool's moving parts. The high-strength columns and low center of the gravity bed build the foundation for the high performance of the machine.



+ Y axis

The Y-axis adopts linear guide rails, which prevents crawling at low speeds. At the same time, it adopts the guide rail step structure design, which not only ensures the rigidity of the gantry frame, but also reduces the tilting moment of the sliding saddle and ram.



+ Roller slider

The use of roller sliders greatly increases the load carrying capacity and enhances the positioning accuracy, repeatability accuracy and rigidity of the machine tool.



+ Z axis

The Z-axis uses nitrogen hydraulic counterweight to ensure accurate and reliable balance quality.

BASIC STRUCTURE

Finite element analysis was conducted on the machine tool structure at various stages from basic design to ensuring high-speed and high-precision continuous processing. Simulation experiments were conducted on the deformation caused by the machine tool center bearing load to ensure the excellent bending rigidity of the machine tool.



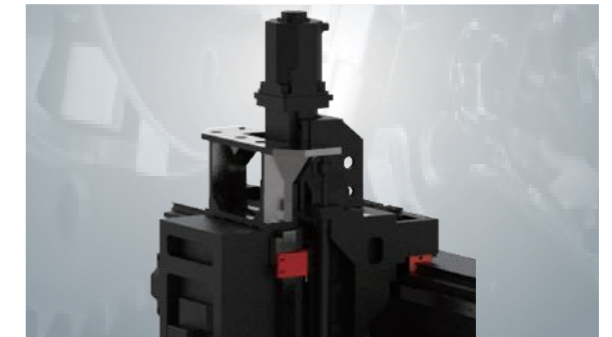
ZF gearbox

The spindle is optional equipped with a two-speed gearbox to increase the spindle output torque.



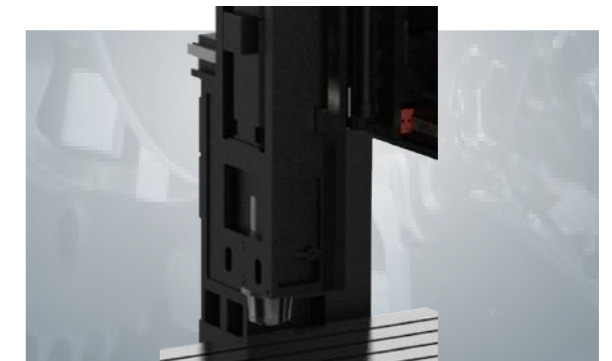
Side milling head

It can be equipped with a 90° milling head to achieve five-sided processing.



Nitrogen balance cylinder

Balance the weight of the spindle head to achieve high-speed, high-precision machining.



T-shaped ram structure

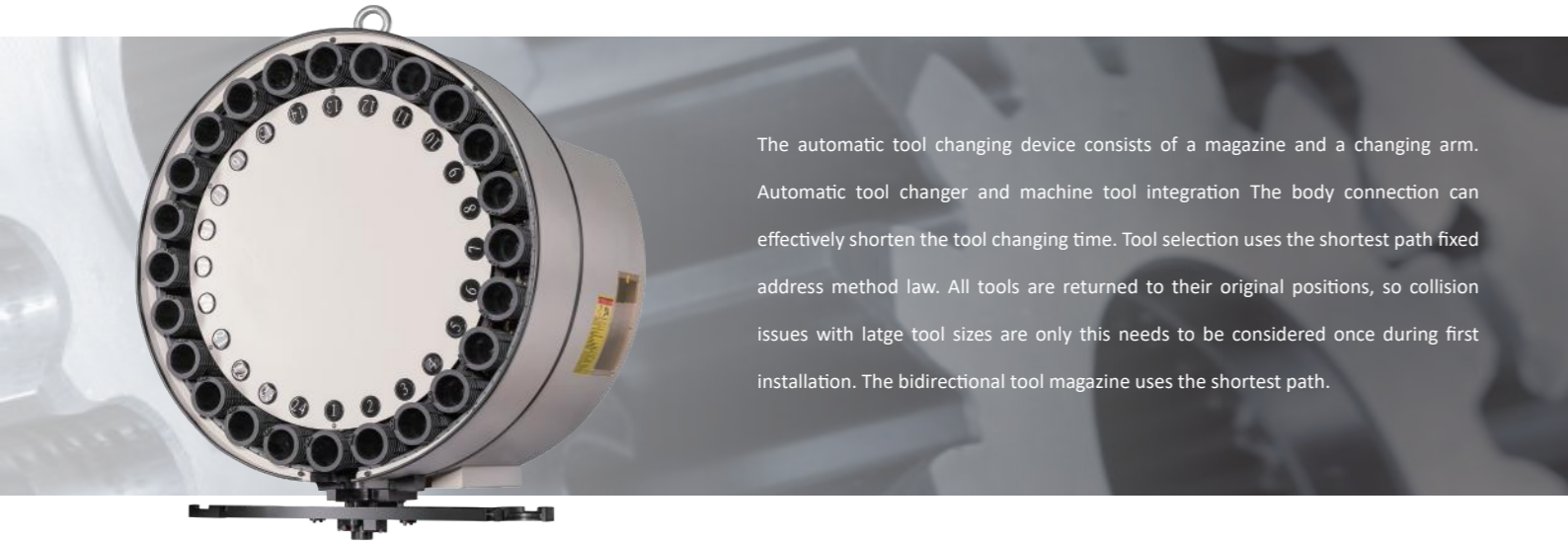
Compact structure, can withstand large torque.



Workbench

It comes standard with two longitudinal spiral chip conveyors and one transverse chain plate chip conveyor.

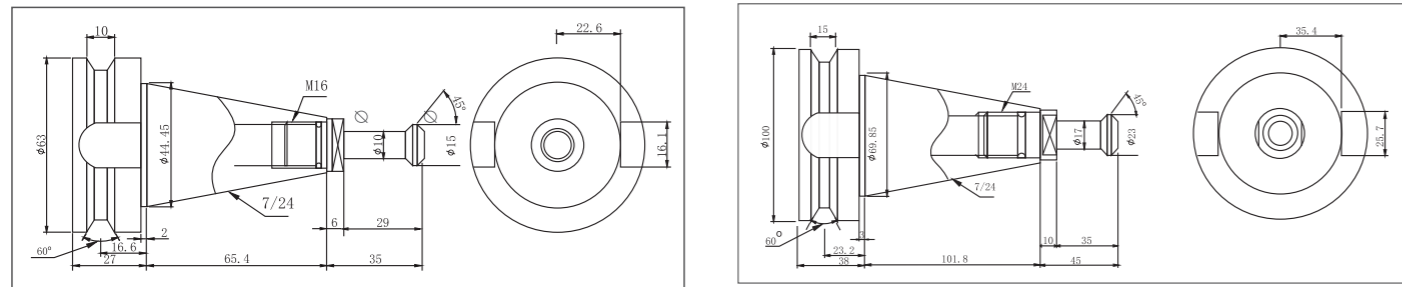
TOOL MAGAZINE



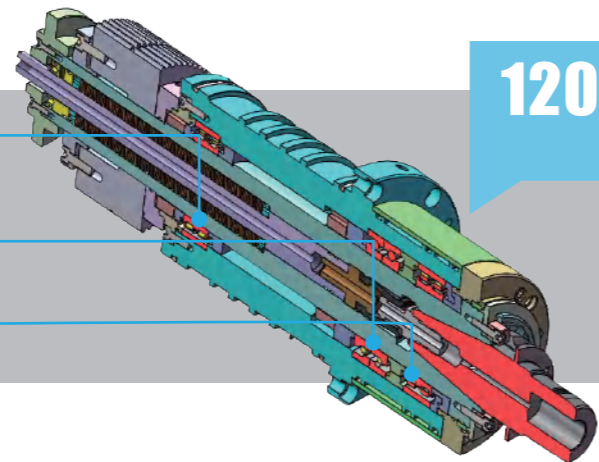
The automatic tool changing device consists of a magazine and a changing arm. Automatic tool changer and machine tool integration The body connection can effectively shorten the tool changing time. Tool selection uses the shortest path fixed address method law. All tools are returned to their original positions, so collision issues with large tool sizes are only this needs to be considered once during first installation. The bidirectional tool magazine uses the shortest path.

Tool specification

BT - 40/50



Spindle



NN3016 double row cylindrical roller bearing

90BAR thrust angular contact ball bearing

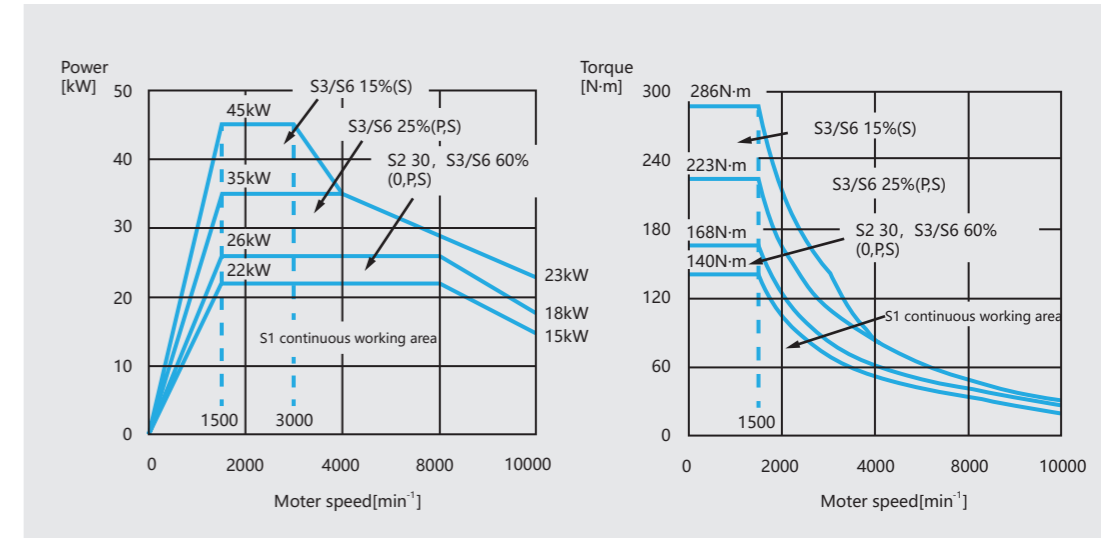
NN3018K double row cylindrical roller bearing

The spindle of the gantry machining center has smooth rotation characteristics, excellent acceleration capabilities and high reliability. With the built-in encoder, it can achieve high-precision positioning and control. An air-cooled asynchronous motor is selected, which has a compact structure and features high output and high torque.

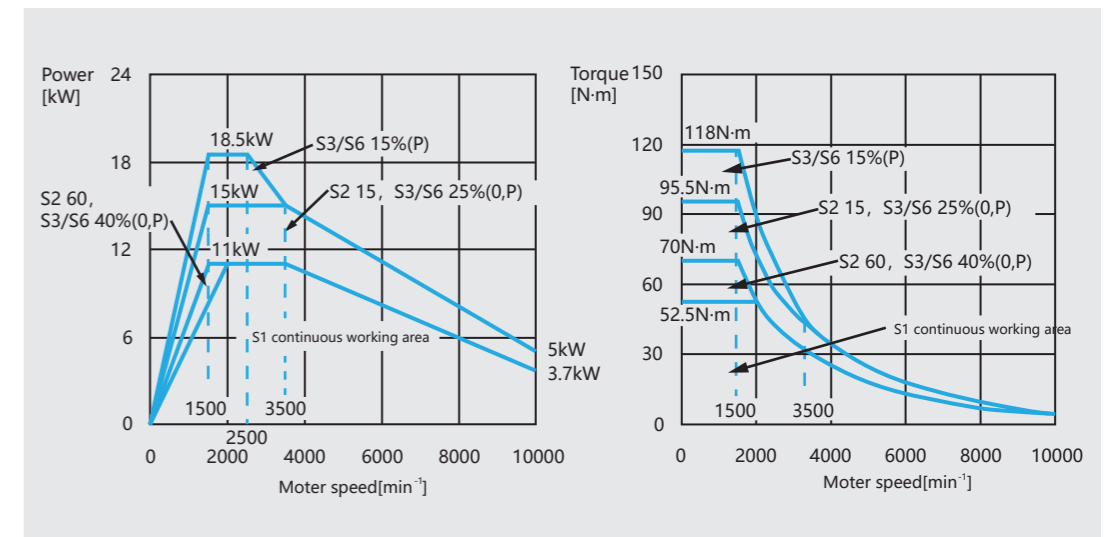
Spindle motor HRV control makes the control more efficient, generates less heat, and is waterproof design in line with international standards(IEC).

MOTOR CHARACTERISTIC CURVE

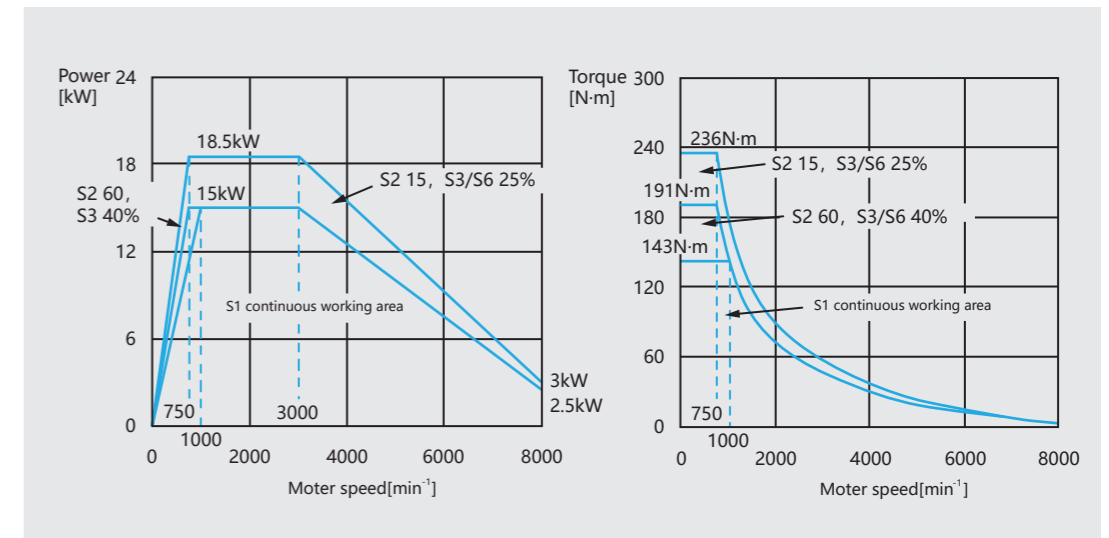
7.5/11kW



11/15kW



15/18.5kW



CNC CONTROL SYSTEM

Hardware Configuration

Number of control axes: X, Y, Z three coordinate axes and one spindle.

Number of linkage axes: X, Y, Z three-axis linkage

Operation panel: full-function CNC keyboard

Human-machine communication interface: standard configuration PCU50

Input and output module: expanded through IM361 interface module
Separate 57-300 input and output module

CNC Function

Compensation function: backlash compensation, over-quadrant error compensation, more flexible tool length and tool radius compensation, temperature compensation(optional)

Feed function: feed rate adjustment, feed rate per minute, feed rate per revolution, programmable range acceleration limit.

Spindle function: spindle speed function, spindle override adjustment, spindle orientation accurate stop, speed limit.



Basic Function

data transmission

Complete USB data input and output.

edit function

Program segment retrieval, program number retrieval, background editing, teaching programming and program protection.

operation method

AUTO mode, stand-alone DNC mode, MDI mode, teaching mode, incremental mode, dry run mode, single block mode.

security protection function

Program test function, programmable processing domain limit software limit monitoring, hardware limit monitoring. emergency stop, static monitoring. Speed monitoring. Position monitoring. Contour monitoring.

CNC programming

Fixed cycles for drilling, milling and boring process, metric/imperial size programming, absolute or incremental programming, macro programs, plane selection, workpiece coordinate system.

display function

Current position display, actual cutting speed display, program display, operation error display, alarm information display and self-diagnosis function display.

interpolation type

Positioning, accurate stop, three-coordinate linear interpolation, arbitrary two-coordinate arc interpolation, spiral interpolation, feed pause, thread cutting.

STANDARD CONFIGURATION

- FANUC control system
- watertank cooling device
- automatic lubrication device
- outer protective cover
- spindle taperhole blowing device
- control electrical cabinet
- water gun
- transformer
- electrical cabinet heat exchanger
- hand operated pulse generator
- working lamp
- three color warning light
- LCD monitor
- tools、toolbox
- operation manual
- pneumatic components



Spiral chip conveyor

Simple installation, stable operation and low noise.



The heat exchanger

effectively blocks moisture, oil, gas and dust from entering the electric control box.



Spindle

6000RPM-12000RPM optional, using ultra-precision P4 grade bearings, optional oil cooling to maintain spindle temperature rise stability.



Lead screw

The screw is preloaded to have better rigidity and effectively reduce thermal expansion and contraction , improving service life and accuracy retention.



Chain chip conveyor

The chip conveying speed is fast and the work efficiency is high. It can be applied to various chips such as steel prats, cast iron, copper, aluminum and non-metals.

Each machine has been 100% fully inspected



Laser detection



Spindle deflection detection



Circle detection



Maximum torque cutting

OPTIONAL CONFIGURATION

- automatic tool changer(robot)
- Spindle oil device
- Spindle center water outlet system
- Oil-water separator
- CNC turntable(fourth axis)
- Automatic tool length measurement system
- Manual/automatic side milling head
- ZF gearbox



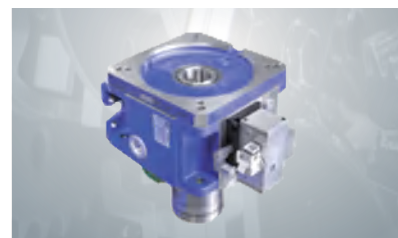
Oil cooler

Maintain a constant temperature to ensure spindle processing accuracy. A constant temperature chamber can be selected.



Oil-water separator

Effectively removes floating oil from cutting fluid, maintains cutting fluid performance and prolongs cutting fluid service life.



ZF gearbox

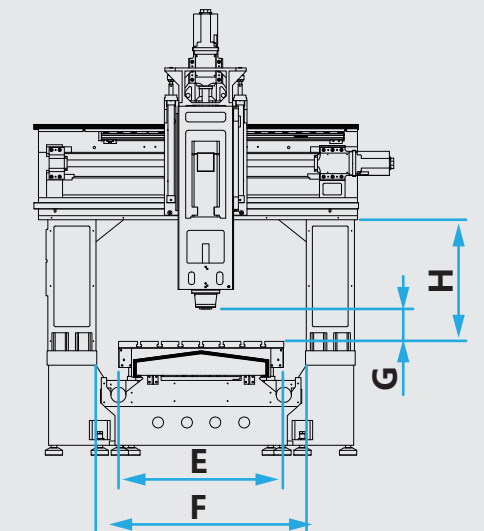
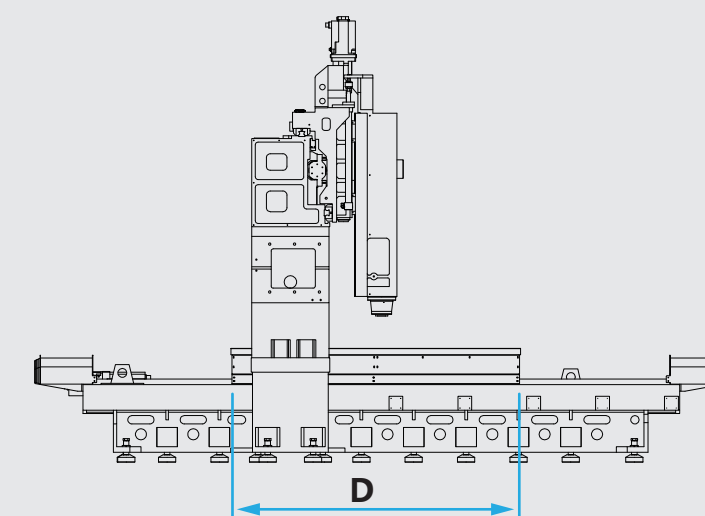
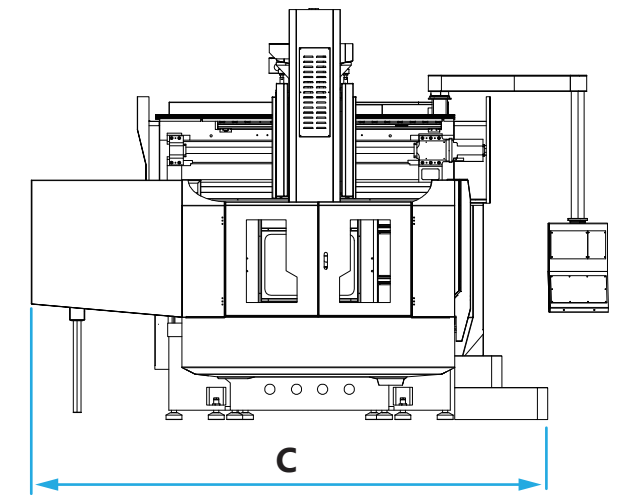
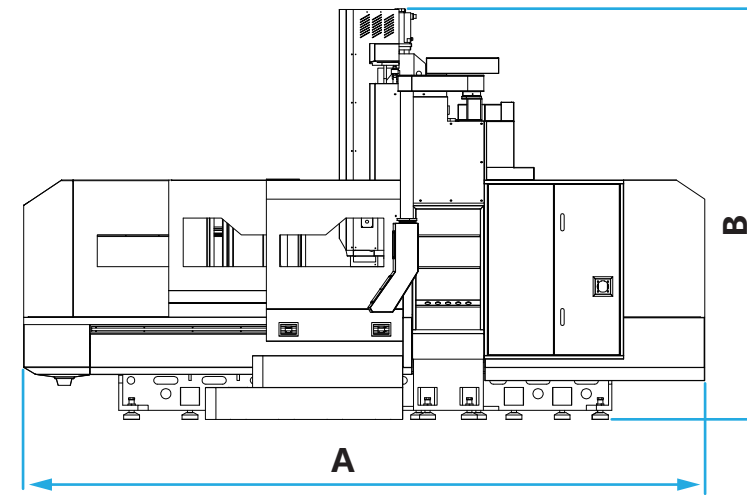
1:4 deceleration to achieve low-speed and high torque processing.



Automatic tool length measuring device

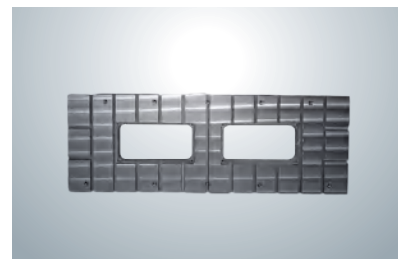
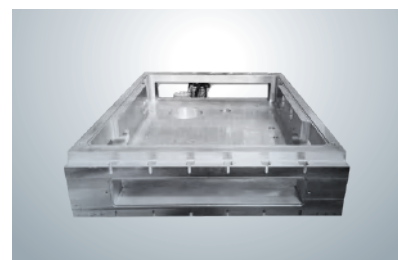
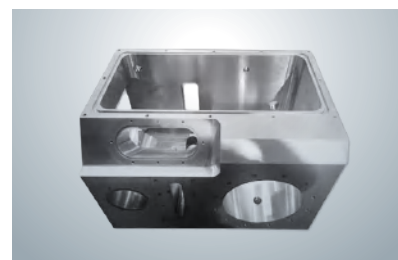
Improve work efficiency and ensure processing accuracy.

MOLD SIZE



APPLICATION

This series of machine tools has strong rigidity, flexible and convenient operation and is suitable for processing large sheet metal parts, box parts, molds etc. After one clamping is completed, milling, boring and drilling can be completed (drilling, expanding, reaming), tapping, countersinking and other processes. The bed is widely used in multi-process, high-demand and high-efficiency automotive industries, industry, engineering machinery, aerospace industry, home appliance mold, mold base processing. It can also be used in machinery manufacturing and other manufacturing industries.



+ Detailed model dimensions

Unit: mm

	A	B	C	D	E	F	G	H
LM-1613L	4450	3200	4024	1700	1200	1400	200	870
LM-2015	5365	3700	4065	2100	1200	1500	170	1000
LM-2518	7120	4750	4510	2500	1600	1800	150	1300
LM-3023	7830	5200	5370	3000	2000	2300	280	1400
LM-4027	10280	5760	5370	4000	2300	2700	280	1400
LM-5023	11830	5200	5370	5000	2000	2300	280	1400
LM-6027	14280	5760	5370	6000	2300	2700	280	1400
LM-8032	19740	7260	6370	8000	2500	3200	300	1730

DETAILED PARAMETERS

PROJECT	LM-1613L	LM-2015	LM-2518	LM-3023	
Journey	Horizontal X-axis	1600mm	2000mm	2500mm	3000mm
	Vertical Y-axis	1300mm	1500mm	1800mm	2200(auxiliary stroke 2700)
	Longitudinal Z-axis	600mm	600mm	800mm	1000mm
	Spindle end face to worktable	200-800mm	200-800mm	150-1150mm	280-1280mm
	Gantry passing height	870mm	1000mm	1300mm	1400mm
	Gantry width	1400mm	1500mm	1800mm	2300mm
	Workbench	Working desk size	1700*1200mm	2100*1200mm	2500*1600mm
T-shaped quantity/size/spacing		7*22*150	7*22*150	9*22*180	9*28*200
Weight capacity		3000kg	4000kg	7000kg	10000kg
Spindle	Spindle speed	50-12000rpm	50-12000rpm	50-6000rpm	50-6000rpm
	Drive mode	direct drive	direct drive	Belt drive	Belt drive
	Spindle motor torque(rated/max.)	52.5/118N·m	52.5/118N·m	143/236N·m	143/236N·m
	Main motor power	11/15Kw	11/15Kw	15/18.5Kw	15/18.5Kw
Servo axis	X/Y/Z rapid movement speed	20/20/20m/min	20/20/20m/min	15/15/15m/min	12/12/12m/min
	Cutting feed rate	1-10000mm/min	1-10000mm/min	1-10000mm/min	1-10000mm/min
	Counterweight method	/	/	Nitrogen counterweight	Nitrogen counterweight
	Min. feed amount	0.001mm	0.001mm	0.001mm	0.001mm
Tools/Tool magazine	Tool magazine form	ATC (optional)	ATC (optional)	ATC (optional)	ATC (optional)
	Tool holder specifications	BT-40	BT-40	BT-50	BT-50
	Max. tool length	300mm	300mm	300mm	300mm
Main accuracy (full stroke)	Positioning accuracy(X/Y/Z)	0.012/0.01/0.01mm	0.015/0.012/0.012mm	0.025/0.015/0.012mm	0.025/0.015/0.013mm
	Repeatability(X/Y/Z)	0.01/0.008/0.008mm	0.012/0.01/0.01mm	0.020/0.012/0.010mm	0.020/0.013/0.07mm
Other	Machine footprint & heigh	4450*4024*3200	5365*4065*3700	7120*4750*4510	7830*5200*5370
	Machine weight	13500kg	15500kg	24000kg	37000kg
	Z-axis configuration	45mm*6	45mm*6	hard rail	hard rail
	CNC system	FANUC 0iMF PLUS			

((Our company's products are constantly being improved, and the above information is subject to change without prior notice))

PROJECT	LM-4027	LM-5023	LM-6027	LM-8032	
Journey	Horizontal X-axis	4000mm	5000mm	6000mm	8000mm
	Vertical Y-axis	2700(auxiliary stroke 3050)	2200(auxiliary stroke 2700)	2700(auxiliary stroke 3050)	3200(auxiliary stroke 3800)
	Longitudinal Z-axis	1000mm	1000mm	1000mm	1250mm
	Spindle end face to worktable	280-1280mm	280-1280mm	280-1280mm	300-1550mm
	Gantry passing height	1400mm	1400mm	1400mm	1730mm
	Gantry width	2700mm	2300mm	2700mm	3200mm
	Workbench	Working desk size	4000*2300mm	5000*2000mm	6000*2300mm
T-shaped quantity/size/spacing		11*28*200	9*28*200	11*28*200	11*28*200(1*28*180 on both sides)
Weight capacity		12000kg	14000kg	18000kg	30000kg
Spindle	Spindle speed	50-6000rpm	50-6000rpm	50-6000rpm	50-6000rpm
	Drive mode	Belt drive	Belt drive	Belt drive	Belt drive
	Spindle motor torque(rated/max.)	220/272N·m	220/272N·m	220/272N·m	220/272N·m
	Main motor power	15/18.5Kw	15/18.5Kw	15/18.5Kw	15/18.5Kw
Servo axis	X/Y/Z rapid movement speed	12/12/12m/min	12/12/12m/min	10/10/10m/min	10/10/10m/min
	Cutting feed rate	1-10000mm/min	1-10000mm/min	1-10000mm/min	1-10000mm/min
	Counterweight method	Nitrogen counterweight	Nitrogen counterweight	Nitrogen counterweight	Nitrogen counterweight
	Min. feed amount	0.001mm	0.001mm	0.001mm	0.001mm
Tools/Tool magazine	Tool magazine form	ATC (optional)	ATC (optional)	ATC (optional)	ATC (optional)
	Tool holder specifications	BT-50	BT-50	BT-50	BT-50
	Max. tool length	300mm	300mm	300mm	300mm
Main accuracy (full stroke)	Positioning accuracy(X/Y/Z)	0.035/0.025/0.015mm	0.035/0.025/0.015mm	0.040/0.025/0.015mm	0.040/0.025/0.015mm
	Repeatability(X/Y/Z)	0.025/0.015/0.015mm	0.030/0.020/0.010mm	0.030/0.015/0.015mm	0.030/0.015/0.015mm
Other	Machine footprint & heigh	10280*5760*5370	11830*5200*5370	14280*5760*5370	19740*7260*6470
	Machine weight	46000kg	44000kg	58000kg	100000kg
	Z-axis configuration	hard rail	hard rail	hard rail	hard rail
	CNC system	FANUC 0iMF PLUS			

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