



CRONOS Series

Vertical Machining Center

maxmill Since 1960

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IT'S VERY WELL
MADE IN TAIWAN

CE ISO 9001

All specification are subject to change without prior notice.



With CRONOS'S powerful capabilities, conquering extremely heavy duty workloads will never be a problem for you.



VMC - 1490 / 1690

VMC - 1890 / 2090



VMC- 1890 / 2090

Rigid, box-type slideways on 3 axes, high chip removal rate, rugged construction throughout, vast machining bed and high torque spindle are all presented in the **CRONOS series** to make heavy duty machining the easiest ever.

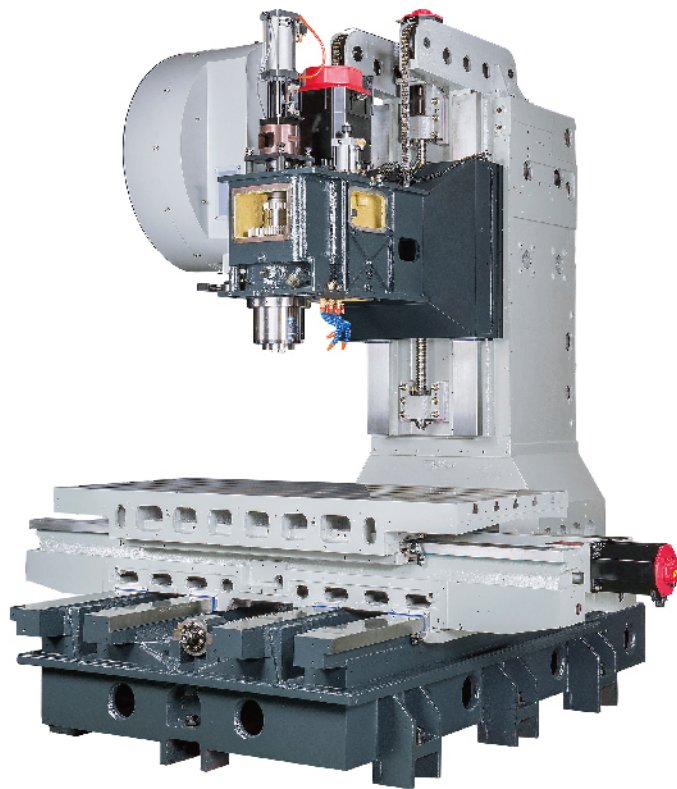
FEATURES

- Is constructed of a vast machine bed with four box ways providing everlasting cutting performance reliability.
- Specifically designed for heavy-duty cutting, high chip removal applications; special double gibs locked design improve the dynamic performance of continuous movement. Also, the structure reinforced saddle by emission-type ribs offers excellent dynamic stability.
- Designed with heavier construction and a high-torque to reduce cycle time for heavy steel operations.

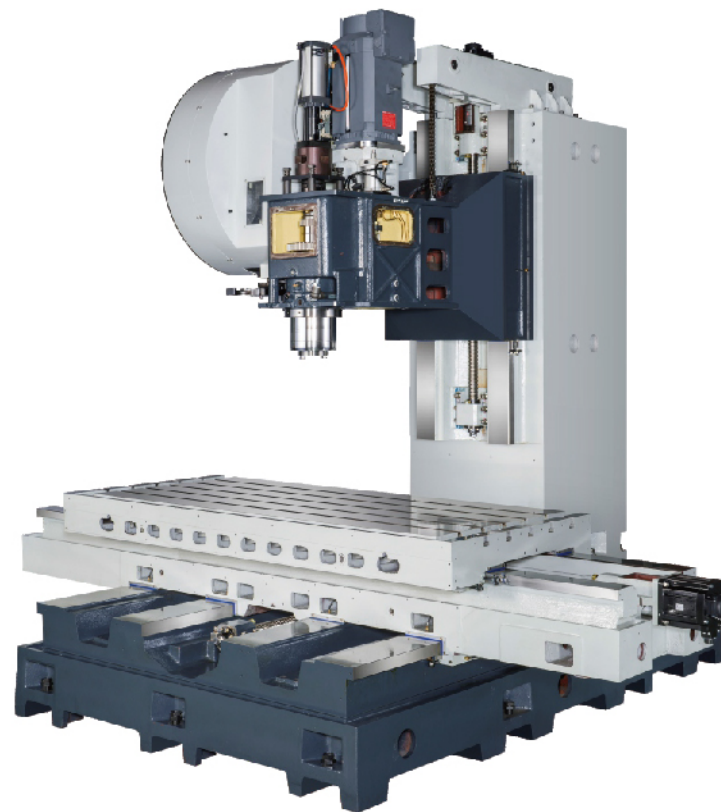


VMC- 1490 / 1690

Versatility
Flexibility
Reliability



VMC- 1490 / 1690



VMC- 1890 / 2090

Outstanding Features

- The pyramid machine construction features a rigid structural ratio. The major casting parts are special design of emission-type rib reinforced, ensuring high accuracy for various machining applications. This outstanding machine construction effectively extends service life and features stable thermal effect and added dampening effect.
- When installing 3 axes ball screws, ball-bar testing and laser equipment are employed for parameter adjustment to achieve the best possible accuracy.
- X, Y, Z axes are rigid box type slideways. All slideways are hardened and precision ground and then coated with high quality, low friction Turcite-B for maximum wear resistance. The mating surfaces are precision treated for long term accuracy.
- Optimized machine construction. The major machine parts, such as base, column and saddle, etc., are manufactured from high quality alloy cast iron. It features maximum material stability, minimum deformation and lifetime accuracy. Square slideways feature a low friction co-efficient.
- 4 box ways on Y-axis are assembled with gibs and wedges for utmost accuracy assurance, also assuring outstanding stability for table longitudinal movements.

Lifetime Accuracy and the Utmost in Rigidity.

Based on the tradition of precision manufacturing capabilities, outstanding scraping techniques and with attention to every detail, results in extremely smooth slideways and precise mating surfaces. Also, the fine craftsmanship upgrades machining accuracy, rigidity and ensures lifetime reliability.

Spindle

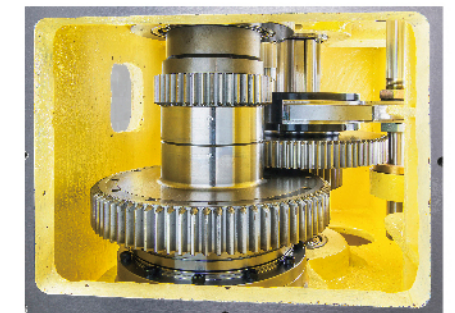
The spindle head has coolant circulation system. The circulated cooling system effectively reduce the heat generated from spindle and gears, while performing heavy cutting or high speed cutting. The cooling system avoids spindle deformation due to over heating and avoids affecting machining accuracy due to the spindle center offset, while ensuring long service life of the spindle bearings.

Catching system has a steel ball to hold the tool shank firmly

Spiral circulated grooves on the spindle sleeve, incorporated with spindle oil cooler system as standard Efficiently remove the generating temperature providing the best solution on spindle accuracy for long term operation.



**Gear type spindle
(Long nose)**



The speed gears in spindle stock are manufactured from Japan-imported Chromolybedenum alloy steel, carburized and precision ground to class 0 of JIS standards.

Chip Conveyor (optional)

During machining, chips are flushed into the chip auger, then delivered to chip tray. This ensures a cleaner working area at all time.

Please choose the most suitable chip conveyor accordance to your machining chip scenario

Chip type	Curly Iron Chip	Metallic Chip	Non-Curly Chip	Curly Aluminum Chip	Aluminum Chip	Non-Metallic Chip
Conveyor type						
Link type	●	●	●	○		○
Screw type		○	○		○	○
Scraper type			○	●	●	●
Vanes type		○	○		○	○

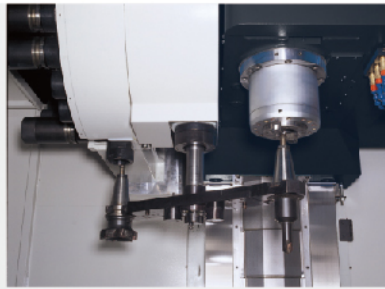
● Best efficiency

○ Above average efficiency

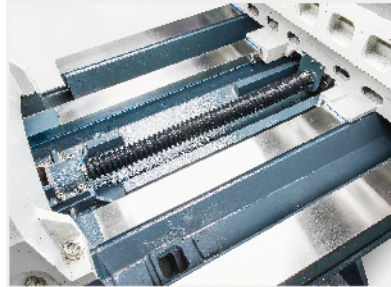
○ Other possible choices



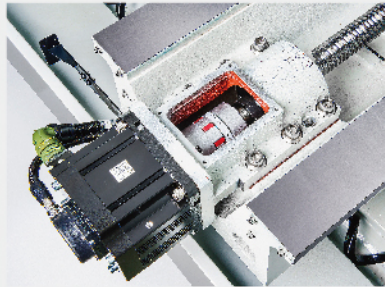
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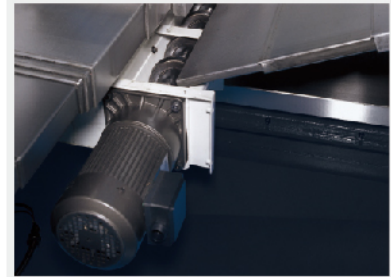
Reliable ATC system:
Fast and reliable cam ATC allows each tool change in 3.5 seconds to increase work efficiency.



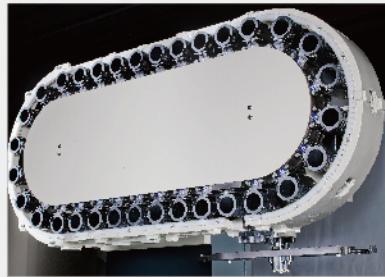
Ball screw protective cover prevents the metal chip into ball screw while movement. Greatly upgrade your machining accuracy.



Precision ground class double-nut ball screw in Grade C3 and ballnut diameter is 50mm. Collocation with high torque of coupling without backlash ensures the machining accuracy.

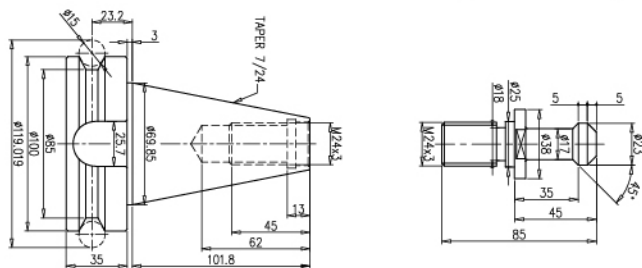


YZ-axis slant cover protection chip auger(work table rear) protects the guideway for durable operation.



Arm type 32 tools with BT50.

Specification of tool holder and pull stud.(BT-50)



Static accuracy inspection:
(Test depends on our standard operation and environment)

Right angle	Surface	Standard value (μ m / 300 m)	Testing value (μ m / 300 m)
	X-Y / Y-Z / Z-X	0.015 / 0.015 / 0.015	0.007 / 0.010 / 0.011
Roundness cutting accuracy	Surface	Standard value (μ m)	Testing value (μ m)
	X - Y	0.015	0.01

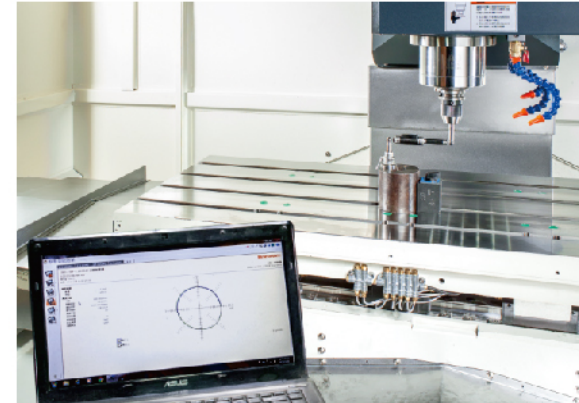
Quality & Inspection

Laser inspection



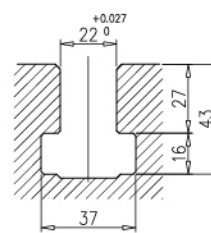
The high precision laser unit is applied for inspecting the geometric errors of machinery in axis movement. Inspection items include linear positioning accuracy, pitch error and backlash, etc.

Ball-bar inspection



A sophisticated ball bar tester is applied for adjusting the roundness accuracy and inspecting machining accuracy. Ensure the perpendicularity accuracy of 3D space.

Size of T-Slots



Machining ability analysis:
(Workpiece: S45C)

Working: Drilling	Working: Tapping	Working: Face mill
 Dia.(mm) x Rapid (mm / rev.) ø50 x 0.4	 Dia.(mm) x Pitch (mm / rev.) M30 x 3.5	 Width (mm) x Deep x Rapid (mm/rev) 120 x 8 x 450

Machine Specifications

Model			VMC-1490	VMC-1690	VMC-1890	VMC-2090
TRAVEL	X axis	mm(inch)	1,400(55.2)	1,600(63.0)	1,800(70.9)	2,000(78.8)
	Y axis	mm(inch)	900(35.5)	900(35.5)	900(35.5)	900(35.5)
	Z axis	mm(inch)	750(29.5)	750(29.5)	700(27.6)	700(27.6)
	Spindle nose to table	mm(inch)	150~900(5.9~35.5)	150~900(5.9~35.5)	250~950(9.9~37.4)	250~950(9.9~37.4)
	Spindle center to solid column surface	mm(inch)	990(39.0)	990(39.0)	990(39.0)	990(39.0)
TABLE	Working area	mm(inch)	1,700 x 850(67.0 x 33.5)	1,900 x 850(74.8 x 33.5)	2,100 x 970(82.7 x 38.2)	2,300 x 970(90.6 x 38.2)
	Max.loading	kg	1,600	2,000	2,500	2,800
	T-Slots (No. x Width x Pitch)	mm(inch)	5 x 22 x 150(5 x 0.9 x 6.0)	5 x 22 x 150(5 x 0.9 x 6.0)	5 x 22 x 150(5 x 0.9 x 6.0)	5 x 22 x 150(5 x 0.9 x 6.0)
SPINDLE	Tool shank	—	BT-50	BT-50	BT-50	BT-50
	Speed	rpm	6,000	6,000	6,000	6,000
	Transmission	—	2-Speed Geared Head	2-Speed Geared Head	2-Speed Geared Head	2-Speed Geared Head
	Bearing lubrication	—	Grease	Grease	Grease	Grease
	Cooling system	—	Oil cooled	Oil cooled	Oil cooled	Oil cooled
	Spindle motor max. rating	kw(HP)	15(20)	15(20)	18.5(25)	18.5(25)
	Axis motor max. rating (MITSUBISHI)	kw	3.5 / 3.5 / 3.5	3.5 / 4.5 / 3.5	4.5 / 7.0 / 4.5	4.5 / 7.0 / 4.5
	Axis motor max. rating (FANUC α)	kw	4.0 / 4.0 / 4.0	7.0 / 7.0 / 7.0	7.0 / 7.0 / 7.0	7.0 / 7.0 / 7.0
FEED RATES	Rapids on X & Y & Z axis	m/min	15 / 15 / 15	15 / 15 / 15	10 / 10 / 10	10 / 10 / 10
	Max. cutting feedrate	m/min	12	12	10	10
TOOL MAGAZINE	Tool storage capacity	pcs	24 / 32 arm	24 / 32 arm	32 arm	32 arm
	Type of tool (optional)	type	BT-50(CAT-50)	BT-50(CAT-50)	BT-50(CAT-50)	BT-50(CAT-50)
	Max. tool diameter	mm(inch)	110(4.3)	110(4.3)	110(4.3)	110(4.3)
	Max. tool weight	kg	15	15	15	15
AVG. CHANGING TIME (ARM)	Max. tool length	mm(inch)	300(11.8)	300(11.8)	300(11.8)	300(11.8)
	Tool to tool	sec.	3.8	3.8	3.8	3.8
	Chip to chip (50% Z axis)	sec.	11	11	11	11
	Air source required	kg/cm ²	6 up	6 up	6 up	6 up
ACCURACY	Positioning VDI 3341	mm(inch)	P 0.01(0.0004)	P 0.01(0.0004)	P 0.01(0.0004)	P 0.01(0.0004)
	Repeatability VDI 3341	mm(inch)	Ps 0.006(0.0003)	Ps 0.006(0.0003)	Ps 0.006(0.0003)	Ps 0.006(0.0003)
DIMENSION	Machine weight (Net)	kg	11,800	12,800	17,500	18,500
	Power source required	KVA	30	35	35	35
	Floor space (L x W x H)	mm(inch)	3,420 x 3,675 x 3,280 (135.7 x 144.6 x 129.2)	4,030 x 3,675 x 3,280 (158.7 x 144.6 x 129.2)	5,360 x 4,170 x 3,500 (211 x 164.1 x 137.8)	5,620 x 4,170 x 3,500 (221.3 x 164.1 x 137.8)
	Shipment advice	—	1 x 20' FR (1 set)	1 x 20' FR (1 set)	1 x 20' FR (1 set)	1 x 20' FR (1 set)

※All specifications are subject to change without prior notice. ※Machine colors shown in this catalog are for reference only. Correct colors are dependent on the actual machine.

STANDARD ACCESSORIES:

- Mitsubishi M70 controller
- Spindle speed 6,000 rpm(Gear)
- Automatic tool changer
- YZ-axis slant cover protection chip auger (work table rear)
- Full splash guard
- Heat exchanger for electric cabinet
- Automatic lubricating system
- Spindle oil cooler
- Spindle air blast system (M code)
- Spindle air blow system
- Spindle orientation
- Coolant gun and air socket
- Leveling kits
- Removable manual & pulse generator (M.P.G.)
- LED light
- Rigid tapping
- Coolant system and tank
- Cycle finish indicator and alarm lights
- RS-232C interface with cable (10 m)
- Tool Box
- Operational and maintenance manual
- Transformer

OPTIONAL ACCESSORIES:

- Spindle speed 8000 / 10,000 rpm (Belt type)
- Spindle speed 8000 / 10,000 rpm (Direct drive)
- Coolant through spindle (CTS)
- Spindle coolant ring (M code)
- Controller (FANUC / SIEMENS / HEIDENHAIN)
- Automatic tool length measuring device
- Automatic work piece measurement system
- CNC rotary table and tail stock
- Link type chip conveyor with chip bucket
- Linear scales (X/Y/Z axis)
- Coolant through tool holder
- Oil skimmer