

**MICROCUT**  
THE CHALLENGER



**VM/VMC Series**

Vertical Machining Center



National Award  
of Outstanding



ISO 9001:2015  
FM 538421



ISO 14001:2015  
EMS 546518



ISO 50001:2011  
ENMS 642457

# Vertical Machining Center

MICROCUT box way vertical machining center are high-quality machine tool designed to achieve maximum productivity and performance with wide applications for molding industry, automobile industry and general workshops. The machine structure is designed with FMEA to ensure durability and consistency, featuring high level of rigidity and enabling an unsurpassed performance in heavyduty cutting. All aspects of the machine including controller, motion control, coolant collection, chip removing and maintenance service are well designed for easy operation. VMC series provides high performance and making it the best investment long-term.

<b>VM-1000</b>	XYZ: 1000x600x600mm	ISO40 taper spindle
<b>VMC-1100</b>	XYZ: 1100x710x710mm	ISO40 or ISO50 taper spindle
<b>VMC-1300</b>	XYZ: 1300x710x710mm	ISO40 or ISO50 taper spindle
<b>VMC-1600F</b>	XYZ: 1600x800x710mm	ISO40 or ISO50 taper spindle
<b>VMC-1600</b>	XYZ: 1600x900x850mm	ISO40 or ISO50 taper spindle
<b>VMC-2100</b>	XYZ: 2100x900x850mm	ISO40 or ISO50 taper spindle
<b>VMC-3100</b>	XYZ: 3100x900x850mm	ISO40 or ISO50 taper spindle



VMC-3100



VMC-1300



VMC-1600



VMC-1600F



VMC-2100

# Rigid structure

- The major structural components are made of Meehanite cast iron and heat treated to relieve stress thereby assuring maximum rigidity and accuracy.
- Triangulate wide-stance base incorporates a durable ribbed box design for maximum structural loading.
- All castings are reinforced with heavy ribs to resist flex and damp vibrations.
- Hardened and precision ground ways on the 3 main axes. Way bearing surface are plated with Turcite B for smooth and stable movement.



*VMC-3100 frame*

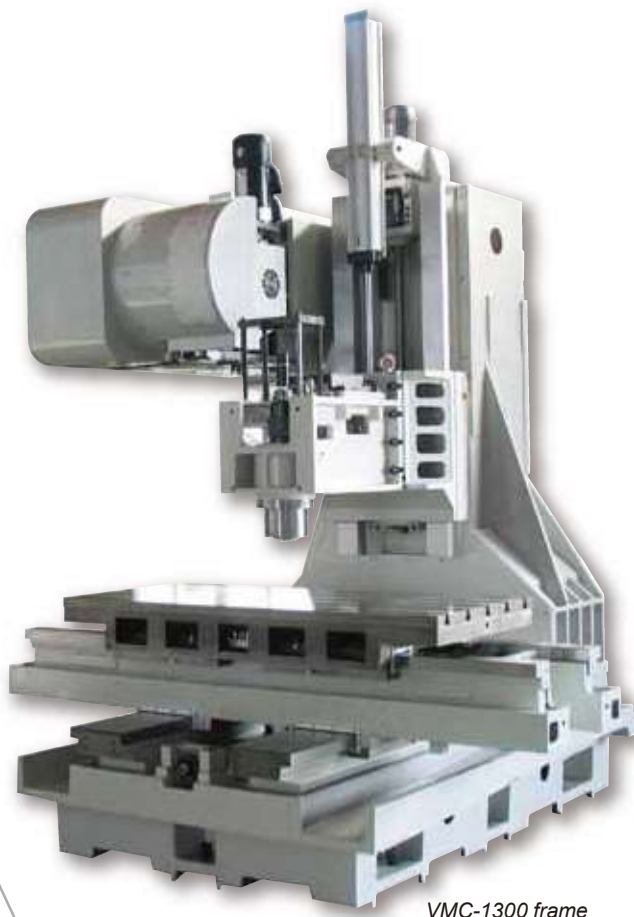


## **Pneumatic Counter Weight on VMC-1100/1300/1600F**

Close circuit pneumatic counter weight system with air tank provides excellent performance. Stable movement eases vibration for high speed vertical rapid traverse.

## **Mechanical Counter Weight on VM-1000/VMC-1600/2100**

Larger machine requires a mechanical counter weight for heavy balancing. Thus on VMC-1600/2100 a wide column and big mechanical counter weight is provided ensures an excellent balancing.



*VMC-1300 frame*

## Column & Saddle

- Trapezoidal shaped column ensures no damp and vibration during machining to provide high machining accuracy.
- Enhanced saddle and fully supported workpiece structure contribute to the ability for heavy duty machining.
- Craftsmanship in hand scrapping ensures high quality and attention to detail in manufacturing process.

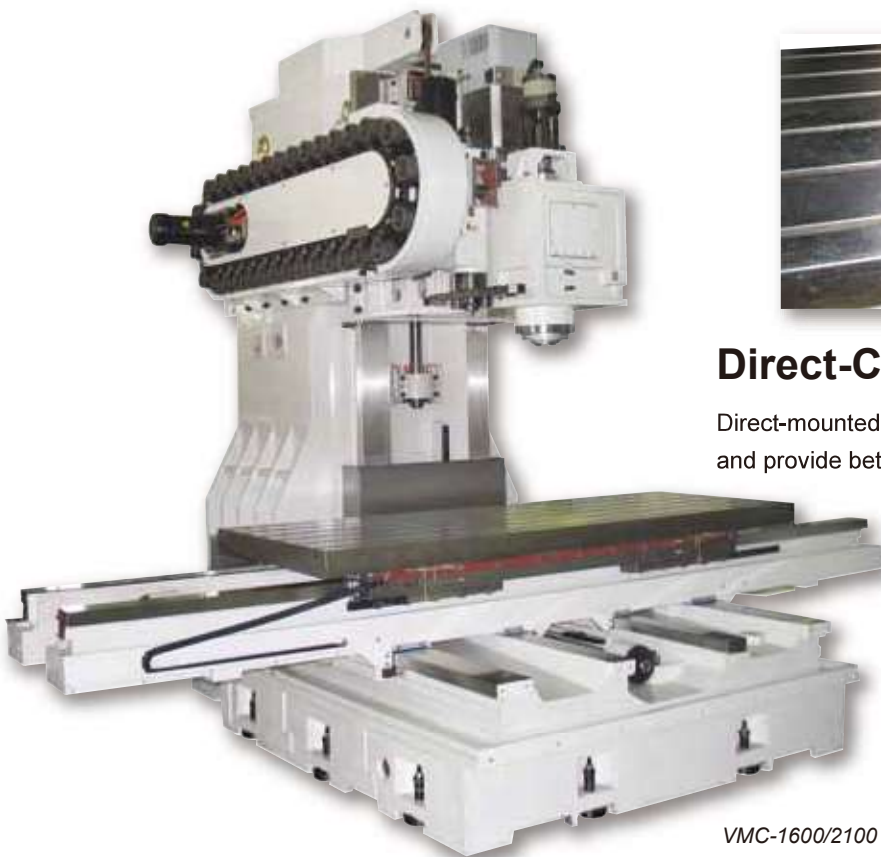
## Y-axis Guideways

Extremely wide guideways on all series of products.

- Four guideways on VMC-1600F VMC-1600 VMC-2100
- Six guideways on VMC-3100
- Two guideways on VM-1000 VMC-1100 VMC-1300

## Double-Anchored Ballscrew

Large diameter ballscrew anchored at both ends for parallelism to the axis guides. High precision class ballscrew with pre-tensioned to eliminate backlash.



*VMC-1600/2100 frame*



## Direct-Coupled Axes Motors

Direct-mounted servo motors improve positioning accuracy and provide better contouring and threading.

# Spindle

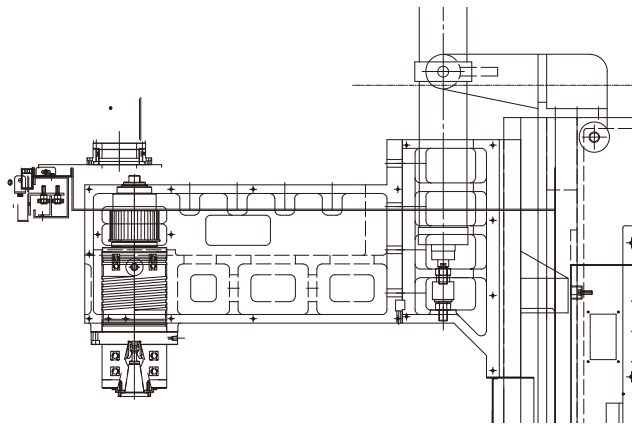


## Spindle Dynamic Balancing

The on line dynamic balancing instrument calibrates the spindle displacement, speed, and acceleration of the full speed range.

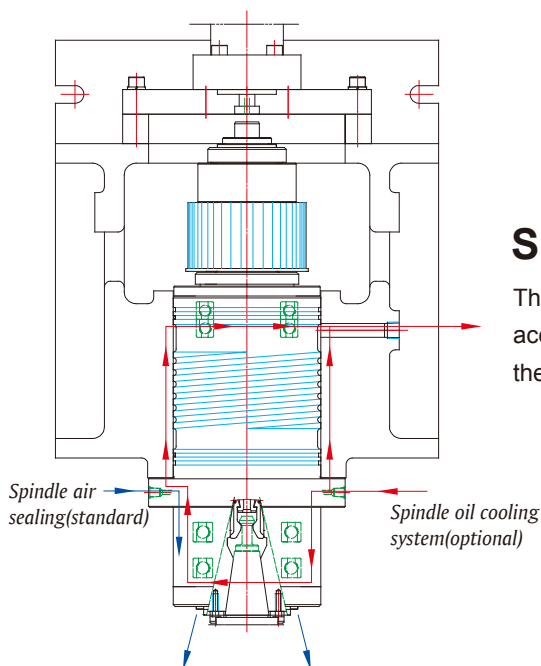
## High Capacity Cartridge Spindle

With preloaded angular-contact bearings throughout and with a large spacer between front bearings to improve radial thrust capacity. Cartridge spindle design for easy maintenance.



## One-Piece Design Headstock

Offers high stability and capacity for heavy duty cutting.



## Thermal Reduction Design

## Spindle Oil Cooler

The cooling system assures spindle accuracy permanently and extends the service life of spindle.



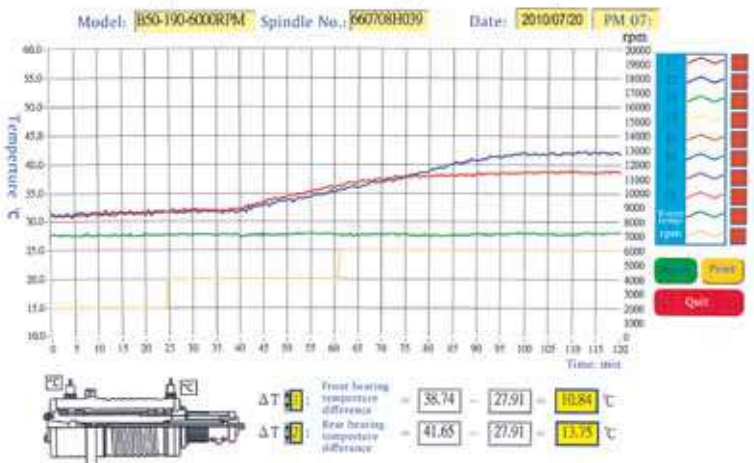


## Geared Head for ISO 50 Taper

- With maximum 6000rpm spindle speed by ISO50 spindle.
- Two-step gear ratio 1.1:1 4.4:1.
- Geared box is dynamic balanced by testing run on inspection table before assembly.



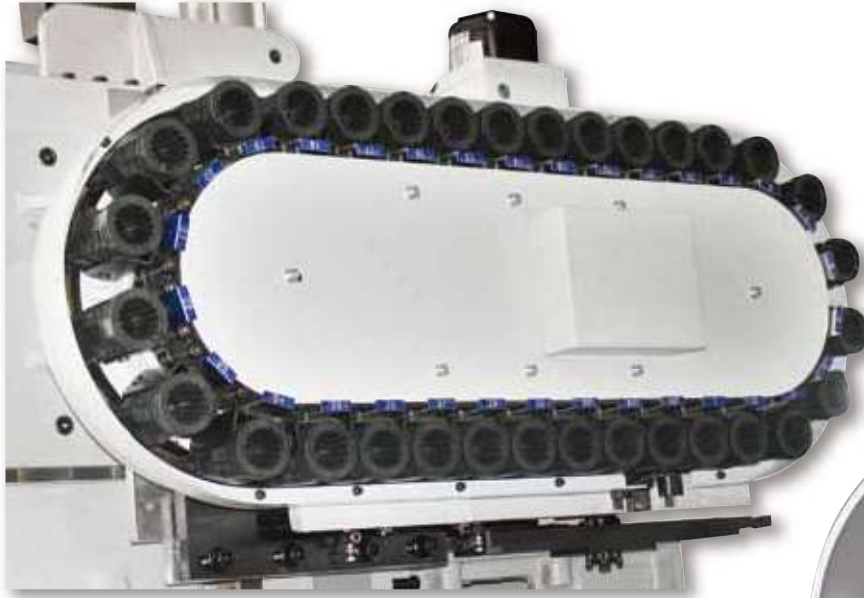
## Spindle Running Test Report



## Spindle Temperature Tracing

Each spindle is well tested before assembled on machine. Two-hour temperature running trace is recorded to confirm the thermal expansion stability.

# Tool Management



*ATC for VMC-1300 ISO40, 32 tools*



*ATC for VM-1000 ISO40, 24 tools*

## **The fast, simple and long-life automatic tool changer provides stable and reliable tool changer.**

- The innovative cam driven mechanism results in the unique ATC. The bi-directional tool selection is achieved by PLC software programming (random).
- The cam driven tool magazine ensures rotation accuracy, and smooth motion while full tools loading.
- ISO 40: 24 tools for VM-1000/VMC-1100, 32 tools for VMC-1300, 40 tools for VMC-1600/2100
- ISO 50: 32 tools for VMC-1100/1300/1600/2100
- ISO 50: 24 tools for VMC-1100/1300/1600/2100 on request



*ATC for VMC-1600/2100 ISO50, 32 tools*





## Chip Management

- Efficient free-flow enclosure design
- Efficient chip conveyor carries out chips to save operation time (opt.)
- Multiple chip flash solution offers easy chip clean.
  - Rear wash down with high pressure pumps (opt.)
  - Top wash down (opt.)



## High Pressure Coolant Through Spindle

Coolant through spindle uses high pressure pump to supply coolant through tool, cooling the cutting edge directly. This clears chips during deep-hole drilling and tapping, increases tool life and allows higher cutting speeds. Two systems are available, one provides individual CTS tank with 600L big capacity and 20 bar or 70 bar high pressure pump are available for selection. The other provides 20 bar high pressure pump built-in with machine major coolant tank which requires less floor space. Both systems include the auxiliary coolant filter.

## Auxiliary Coolant Filter



Individual CTS tank is supplied with an iron filters 25-micron which is re-usable. Built-in system provides 40-micron filter. Both filters take away contamination and particles from the coolant before coolant is recycled through the coolant pump.

# Control



## FANUC CONTROL

### FANUC 0iMF CONTROL (31iMB on request)

- High reliable
- High speed, high-precision, high-quality machining with AI contour control and NANO interpolation
- Machining condition selection function
- Enriched basic functions: Rigid tapping, Tool life management
- Advanced digital servo technology
- User friendly operation: Program Editing, Memory Card, Data server

### Excellent Operations

Integrated Operation & Programming Guidance with extremely simplified operations

#### FANUC MANUAL GUIDE i.....

- Programming Guidance
- With extremely simplified operations

#### FANUC MANUAL GUIDE 0i.....

Integrated Operation Guidance for NC program



## FAGOR CONTROL

### FAGOR 8055 POWER CONTROL

- High speed machining, large look-ahead buffer (200 blocks) and a high speed block processing time (capable of up to 1 millisecond).
- Graphically assisted set up user interfaces
- Preparation help on tool management
- Various programming language provides improved operator ease & efficiency:
  - Wide range of ICON conversational cycles
  - ISO-code language



ICON conversational language



## HEIDENHAIN iTNC530 HSCI CONTROL

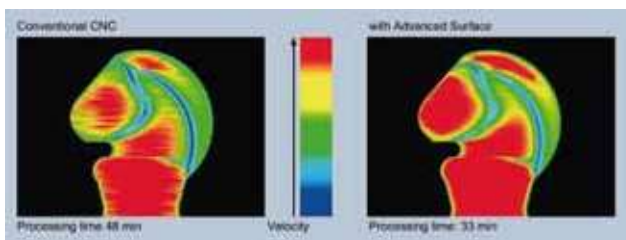
- Minimize setup times
- Graphic support in any situation
- Straight forward function keys for complex contours
- Programming contours unconventionally
- Field-proven cycles for recurring operations
- SmarT.NC—the alternative operating mode
- The iTNC 530 understands DXF files
- Program off line
- Fast data transfer
- With Windows 7
- The iTNC programming station
- Setup, presetting and measuring with touch trigger



## SIEMENS CONTROL

### SIEMENS SINUMERIK 828D CONTROL

- On the control panel, USB, CF, and Ethernet interfaces for data exchange at ease.
- ShopMill machining-step programming
- SINUMERIK CNC programming language with high-level elements and programGUIDE
- Online ISO dialect interpreter: maximum CNC program compatibility
- Advanced Surface: Innovative, high-performance CNC functions
- Animated Elements: Optimized operator guidance
- Easy input of pictographic languages directly via the CNC keyboard
- Easy Message: Integrated mobile radio modem for optimum process monitoring via mobile telephone

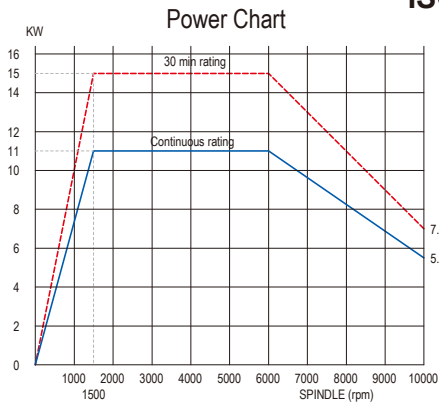


# VM / VMC SERIES Power & Torque Chart

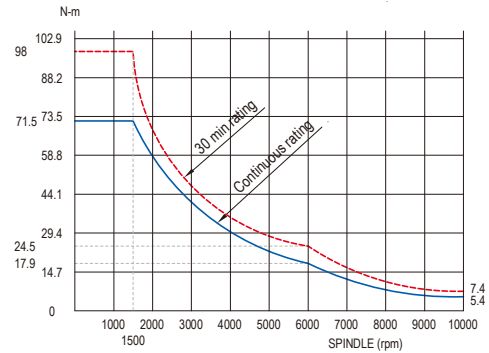
(below data is for FANUC spindle motor, for other controller please contact us)

## ISO40 Spindle

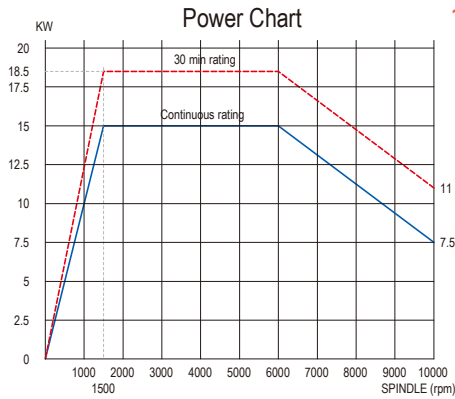
11/15kW



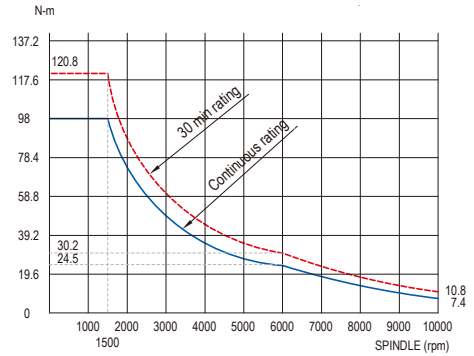
## Torque Chart



15/18.5kW

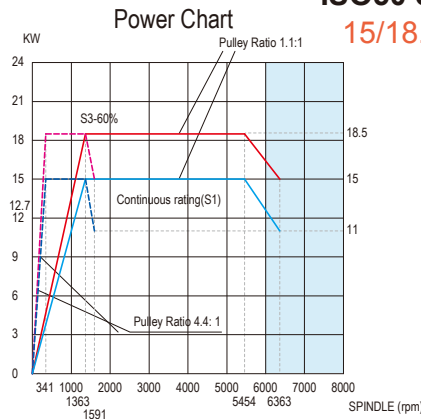


## Torque Chart

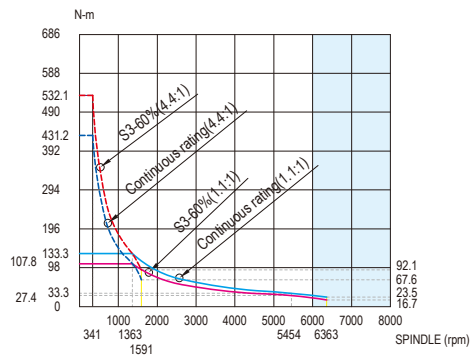


## ISO50 Spindle

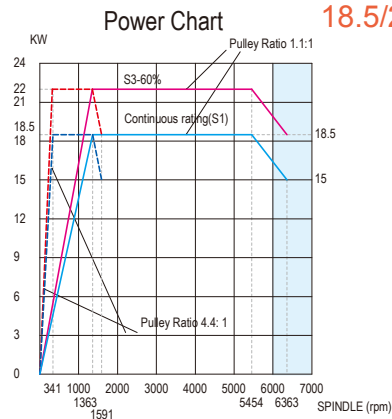
15/18.5kW



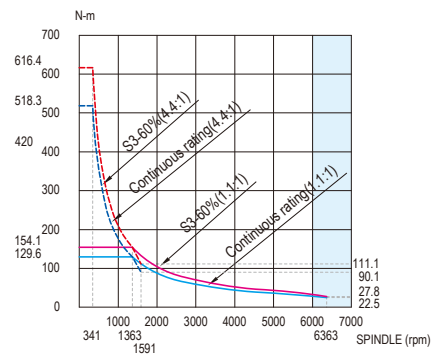
## Torque Chart



18.5/22kW

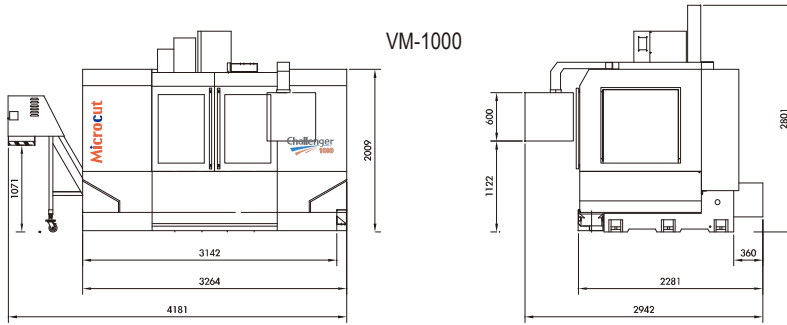


## Torque Chart

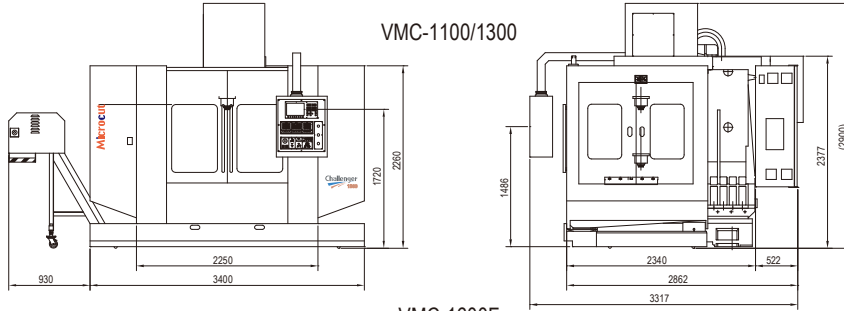


# Layout

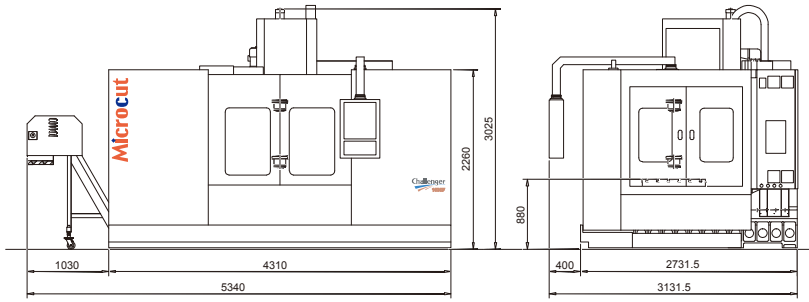
VM-1000



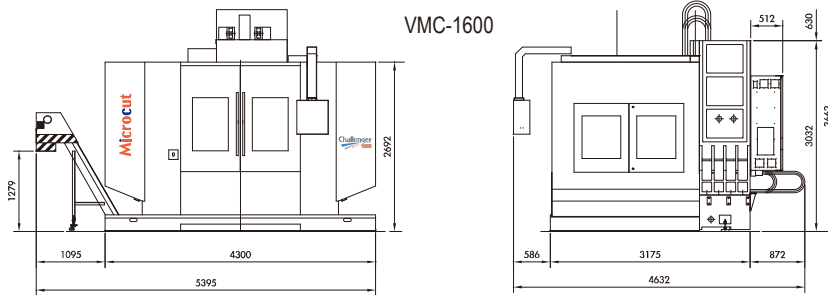
VMC-1100/1300



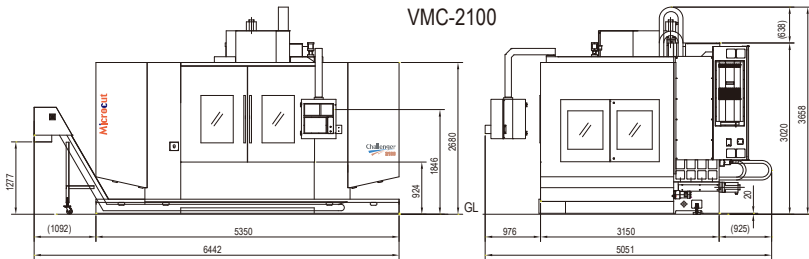
VMC-1600F



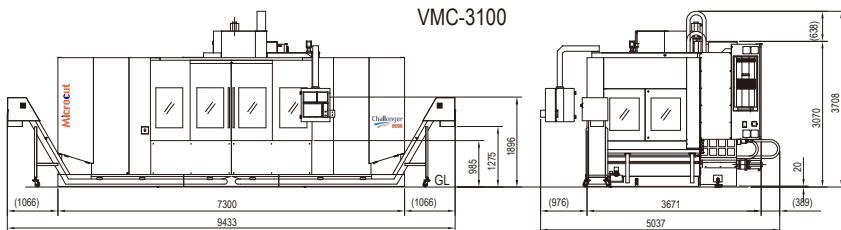
VMC-1600



VMC-2100



VMC-3100



# Technical data

Description	Unit	VM-1000	VMC-1100	VMC-1300
<b>TABLE</b>				
Table size	mm	1300 x 600	1300 x 660	1500 x 660
Table height	mm	880	880	880
Table loading capacity	kg	800	1200	1200
T-slot configuration(w/pitch/no)	mm	18 x 100 x 5	18 x 110 x 5	18 x 135 x 5
<b>TRAVEL</b>				
X axis	mm	1000	1100	1300
Y axis	mm	600	710	710
Z axis	mm	600	710	710
<b>SPINDLE</b>				
Taper	ISO	40	40 / 50	40 / 50
Spindle speed - standard	rpm	10000	10000 / 6000	10000 / 6000
Spindle driven system		belt driven	ISO40-belt driven / ISO50-g geared head	ISO40-belt driven / ISO50-g geared head
Spindle nose to table	mm	100-700	ISO 40 :150-860 / ISO 50 :130-840	ISO 40 :150-860 / ISO 50 :130-840
Gear ratio for gear box (ISO50)		-	1.1 : 1 4.4 : 1	1.1 : 1 4.4 : 1
<b>AXES TRANSMISSION</b>				
X/Y/Z ballscrew	mm	D40 x P12 x C3	D40 x P12 x C3	D40 x P12 x C3
Transmission		Direct	Direct	Direct
XYZ rapid feed	m/min	24	24	24
XYZ feed rate	m/min	10	10	10
<b>GUIDEWAYS</b>				
X - width x thick x guide distance	mm	80 x 35 x 500	90 x 40 x 480	90 x 40 x 480
Y - width x thick x guide distance	mm	135 x 35 x 700	230 x 40 x 870	230 x 40 x 870
Z - width x thick x guide distance	mm	80 x 35 x 300	90 x 40 x 480	90 x 40 x 480
Ballscrew Lubrication X/Y/Z		oil	oil	oil
<b>MOTOR</b>				
Spindle(std.) -ISO40	Siemens	kW	11/15	
	Fagor		11/15.5	
	Fanuc		11/15	
	Heidenhain		10/14	
Spindle(std.) -ISO50	Siemens	kW	N/A	15/20
	Fagor		N/A	17/25
	Fanuc		N/A	15/18.5
	Heidenhain		N/A	15/25
X axis	Siemens	Nm	18	18
	Fagor		16.5	16.5
	Fanuc		20	20
	Heidenhain		18.1	18.1
Y axis	Siemens	Nm	18	18
	Fagor		16.5	16.5
	Fanuc		20	20
	Heidenhain		18.1	18.1
Z axis	Siemens	Nm	18	18
	Fagor		27.3	27.3
	Fanuc		20	20(ISO40); 36(ISO50)
	Heidenhain		16.3	16.3
<b>ATC</b>				
Pocket		24(std)/32(opt)	ISO40:24T(std)/32T(opt) ; ISO50:24T(opt)	
Tool taper		BT/CAT/DIN40		
ATC time (T-T)	sec	1.94 (50Hz)/1.64 (60Hz)	2(24T, 60Hz)/1.94(32T)	2.45(24T)/2.91(32T)
Max. tool weight	kg	(24T)8 / (32T)7	ISO40:(24T)8/(32T)7 ; ISO50:(24T)15/(32T)11	
Max. tool diameter(full load)	mm	(24T)Ø80 / (32T)Ø75	ISO40:(24T)Ø78/(32T)Ø76 ; ISO50:(24T)Ø110/(32T)Ø105	
Max. tool diameter(every next tool)	mm	(24T)Ø130 / (32T)Ø125	ISO40:(24T)Ø120/(32T)Ø150 ; ISO50:(24T)Ø220/(32T)Ø215	
Max. tool length	mm	300	ISO40:(24T)300/(32T)300 ; ISO50:(24T)350/(32T)350	
Max. loading weight	kg	(24T)192/(32T)224	ISO40:(24T)120/(32T)115 ; ISO50:(24T)215/(32T)215	
<b>ACCURACY</b>				
Positioning accuracy	mm	0.01/300	0.01/300	0.01/300
Repeatability	mm	±0.01	±0.01	±0.01
<b>MISCELLANEOUS</b>				
Dimension - L x W x H	m	-	3.4 x 3.24 x 3.0	3.4 x 3.24 x 3.0
Dimension - L x W x H (with chip conveyor)	m	4.2x2.95x2.77	4.3 x 3.24 x 3.0	4.3 x 3.24 x 3.0
Weight	kg	5500	ISO40:7880/ISO50:8880	ISO40:8100/ISO50:9100

\*Specifications are subject to change without notice.

VMC-1600F	VMC-1600	VMC-2100	VMC-3100
1800 x 800	1900 x 900	2400 x 900	3400 x 900
880	1000	1000	1050
2000	2000	2500	3000
18 x 135 x 6	18 x 150 x 6	18 x 150 x 6	18 x 150 x 6
1600	1600	2100	3100
800	900	900	900
710	850	850	850
40 / 50	40 / 50	40 / 50	40 / 50
10000 / 6000	10000 / 6000	10000 / 6000	10000 / 6000
ISO40-belt driven / ISO50-geared head	ISO40-direct driven / ISO50-geared head	ISO40-direct driven / ISO50-geared head	ISO40-direct driven / ISO50-geared head
150-860	100-950	100-950	100-950
1.1 : 1 4.4 : 1	1.1 : 1 4.4 : 1	1.1 : 1 4.4 : 1	1.1 : 1 4.4 : 1
X/Y:D50 x P12 x C3; Z:D40 x P12 x C3	D63 x P12 x C3	D63 x P12 x C3	D63 x P12 x C3
Direct	Direct	Direct	Direct
24	20 / 20 / 18	20 / 20 / 18	10 / 10 / 10
10	10	10	10
90 x 40 x 600	100 x 50 x 580	100 x 50 x 580	100 x 50 x 580
90 x 40 x 690 (inside) / 1450 (outside)	150 x 50 x 1680	150 x 50 x 1680	150 x 50 x 1680
90 x 40 x 480	130 x 50 x 730	130 x 50 x 730	130 x 50 x 730
oil	oil	oil	oil
		15/20	
		15/22	
		15/18.5	
		15/25	
		15/20	
		18.5/26	
		18.5/22	
		20/30	
		48	
		39.7	
		36	
		39	
		48	
		39.7	
		36	
		39	
		48	
		39.7	
		36	
		27.5	
BT(opt)		ISO40:40T/ISO50:32T	
	BT/CAT/DIN 40; BT/CAT/DIN 50		
ISO40- 2(24T)/1.94(32T)		ISO40- 1.94(40T,50Hz)/1.64(40T, 60Hz)	
ISO50- 2.45(24T)/2.91(32T)		ISO50- 2.5(32T,50Hz)/2.1(32T, 60Hz)	
15		7 (ISO40), 15 (ISO50)	
32T)Ø125		ISO40: Ø75/ISO50: Ø125	
(32T)Ø250		ISO40: Ø127/ISO50: Ø229	
32T)300		300	
32T)160		ISO40:(40T)280 ; ISO50:(32T)480	
0.01 / 300		0.01 / 300	
±0.01		±0.01	
4.31 x 3.132 x 3.025	-	-	-
5.34 x 3.132 x 3.025	5.392x5.051x3.66	6.442x5.051x3.66	9.433x5.037x3.708
ISO40:10000/ISO50:11000	20000	22500	30000

## Standard Features

- CNC control
- Z axis with upgraded motor & built-in brake
- High speed precision spindle at 10000rpm For ISO40, 6000rpm for ISO50 with spindle oil cooler
- Rigid tapping function
- Arm type ATC
- Box sliding way for axes
- Telescopic covers for X & Y axes
- Fully enclosed splash guard with interlock device
- Enlarged coolant tank & chip pan
- Automatic lubrication system
- Work light
- Portable MPG
- Leveling pads & bolts for installation
- Tool box & kits
- CE declaration of conformity for EU countries
- Instruction manual & parts list
- Lamp of cycle finish and alarm
- Heat exchanger

## Optional Features

- Enlarge spindle motor
- Coolant through spindle with high pressure pump
- Wash down device
- Chip conveyor & bucket
- Air conditioner
- EMC
- 4<sup>th</sup> axis rotary table
- 4<sup>th</sup>/5<sup>th</sup> axis rotary table
- Oil skimmer
- Spindle oil cooler for #40
- Tool setting probe
- Workpiece measuring probe
- Special machine color on request
- Safety module

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