Challenger

БАЛТИЙСКАЯ ПРОМЫШЛЕННАЯ КОМПАНИЯ

ЭКСКЛЮЗИВНЫЙ ДИЛЕР
BUFFALO MACHINERY CO., LTD.
В РОССИИ И СНГ

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Microcut

Vertical Machining Center
VMC series

Dec. 2011

Challenger

VMC-1600/2100

VMC-1100/1300

Taiwan's Leading Machine Builder

Vertical Machining Center

Microcut/Challenger box way vertical machining center provides you – our customers – more value. Machine structure is designed with FME analyzed to ensure high rigid durability. All aspects of the machine including controller, motion control, coolant collection, chip removing and maintenance service is well designed for easy operation.

VM-1000	XYZ: 1000x500/600x710mm	ISO40 taper spindle
VMC-1100	XYZ: 1100x650x710mm	ISO40 or ISO50 taper spindle
VMC-1300	XYZ: 1300x710x710mm	ISO40 or ISO50 taper spindle
VMC-1600F	XYZ: 1600x850x850mm	ISO40 or ISO50 taper spindle
VMC-1600	XYZ: 1600x900x850mm	ISO40 or ISO50 taper spindle
VMC-2100	XYZ: 2100x900x850mm	ISO40 or ISO50 taper spindle
VMC-3100	XYZ: 3100x900x850mm	ISO40 or ISO50 taper spindle

VMC-1600F

VM-1000

Rigid Foundation

- The major structural components are 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.

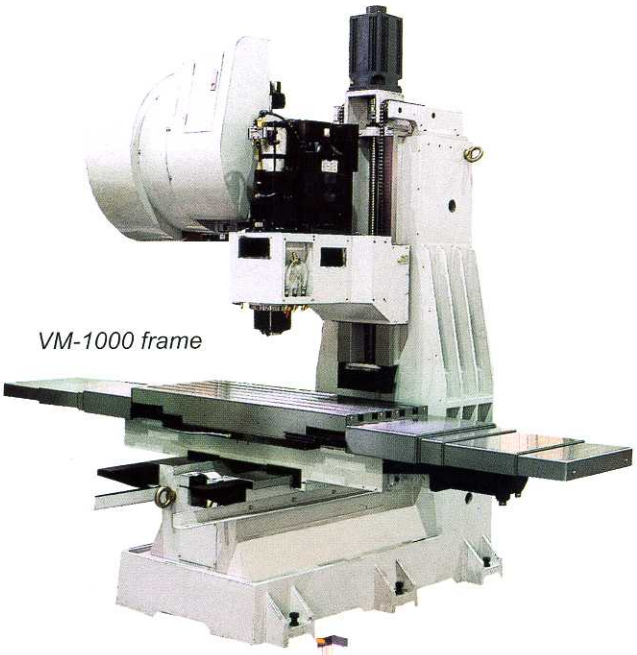
VMC-1600/2100 frame

Pneumatic counter weight on VMC-1100/1300/1600F

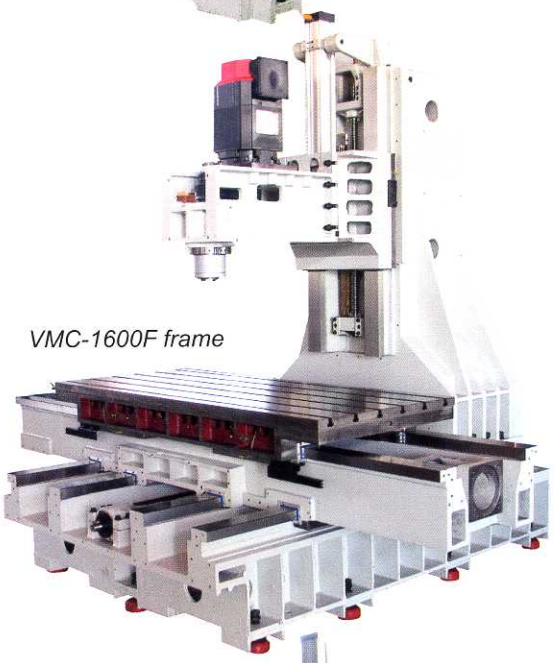
Close circuit pneumatic counter weight system with air tank provides excellent performance. Stable movement eases vibration for high speed vertical rapid traverse.

Mechanical counter weight on VM-1000/VMC-1600/2100

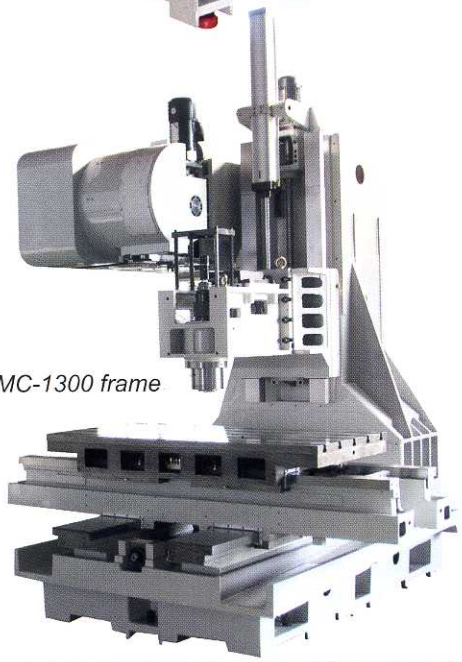
Larger machine requires a mechanical counter weight for heavy balancing. Thus on VMC-1600/2100 a wide column and big mechanical counter weight is provided ensures an excellent balancing.



VM-1000 frame



VMC-1600F frame



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 Guide ways

Extremely wide guide ways 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

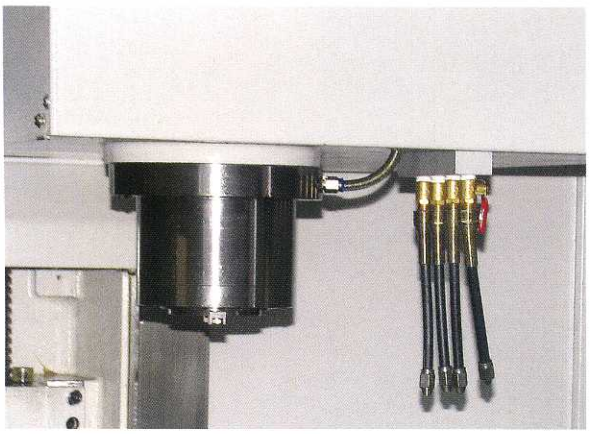
Double-Anchored Ballscrew

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

Direct-coupled axes motors

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

Spindle

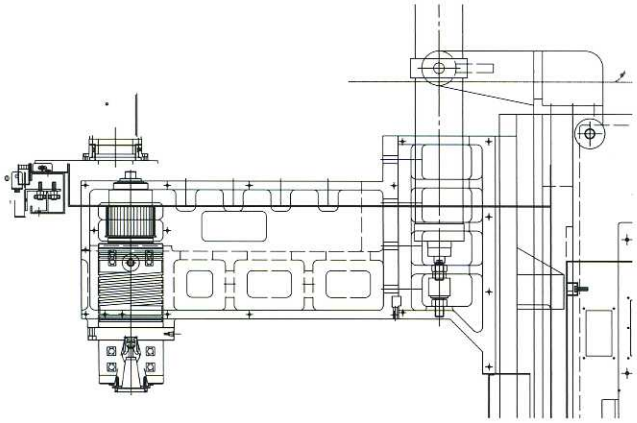


Spindle dynamic balancing

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

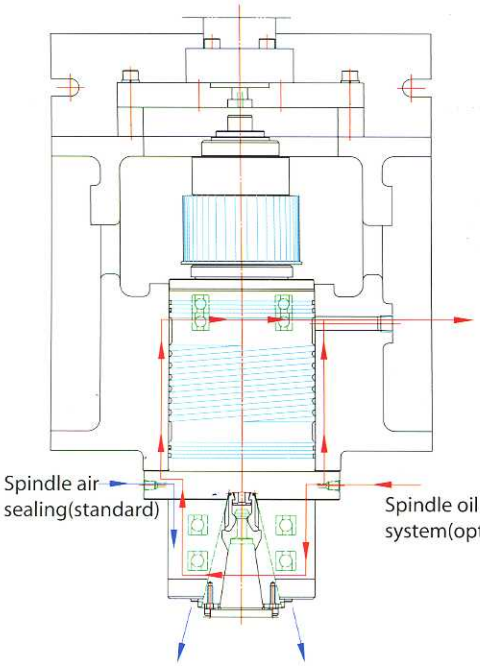
High capacity Cartridge Spindle

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.



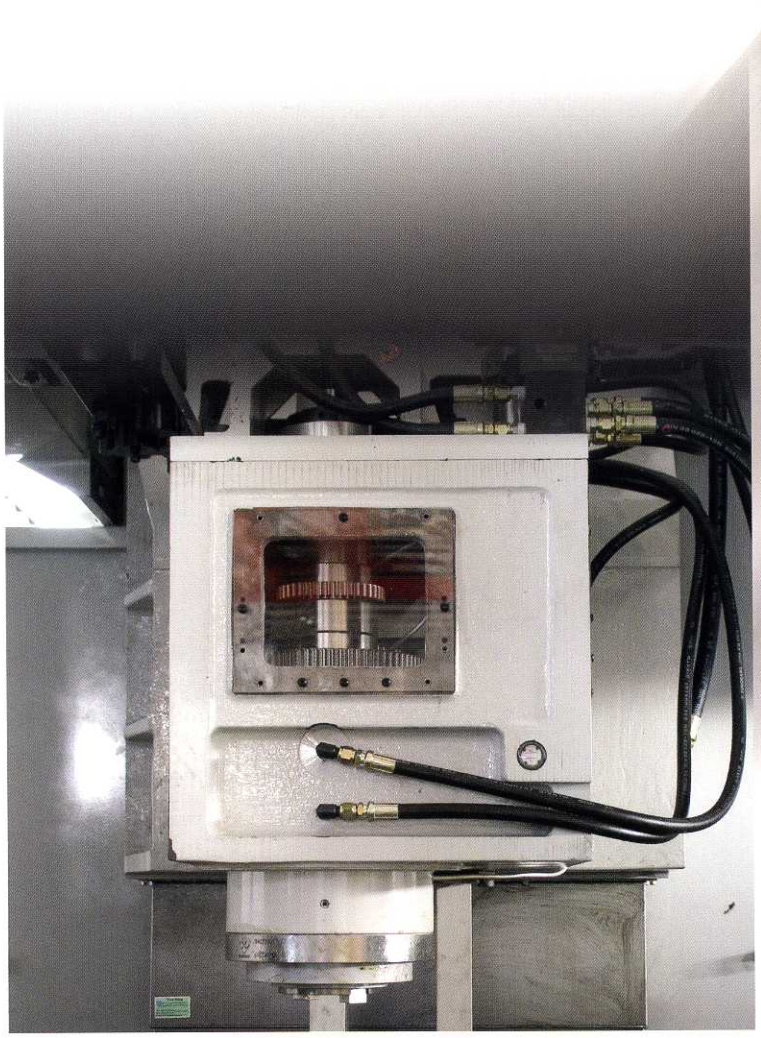
One-piece design Headstock

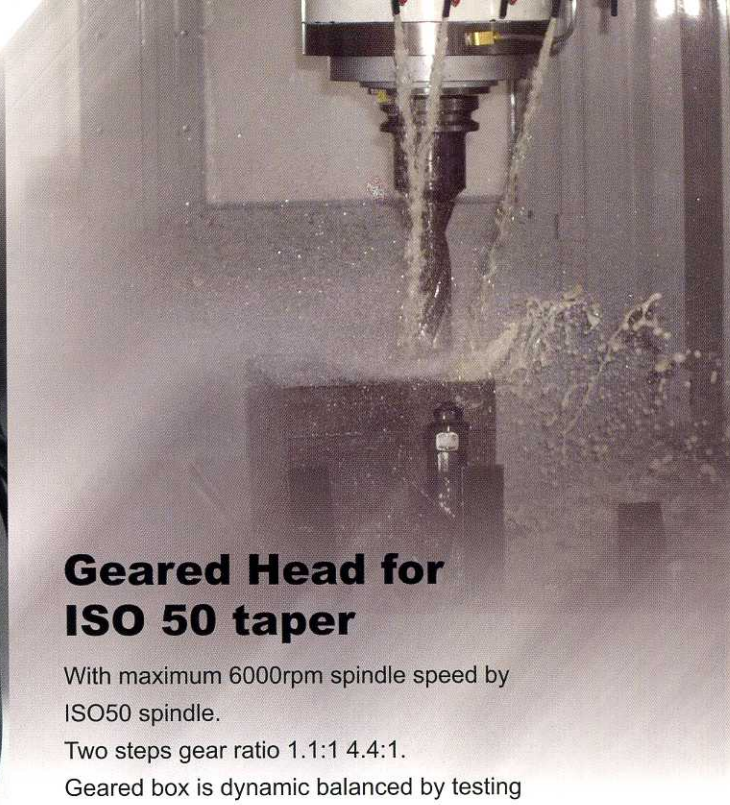
Offers high stability and capacity for heavy duty cutting.



Spindle oil cooler

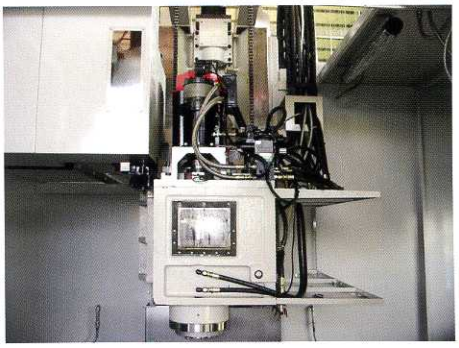
The cooling system assures spindle accuracy permanently and extends the service life of spindle.
Thermal decrease set up

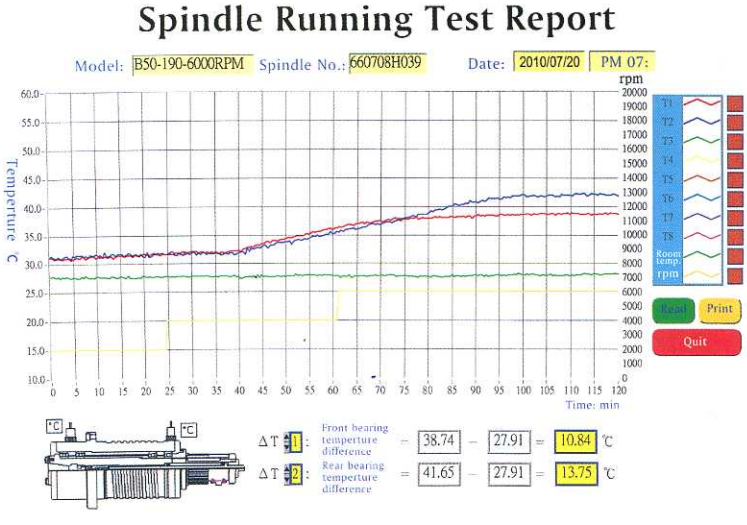




Geared Head for ISO 50 taper

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

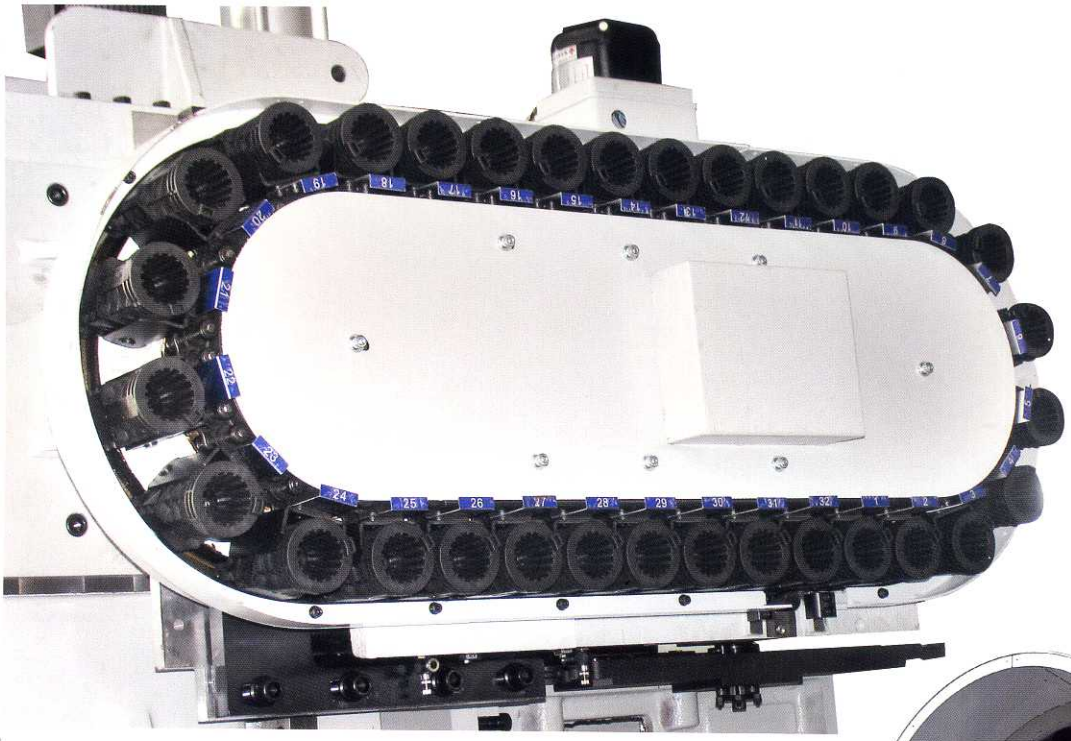




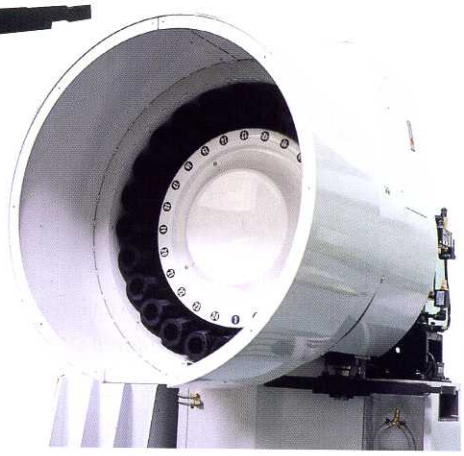
Spindle temperature tracing

Each spindle is well tested before assembled on machine. 2 hours temperature running trace is recorded to confirm the thermal expansion stability.

Tool Management



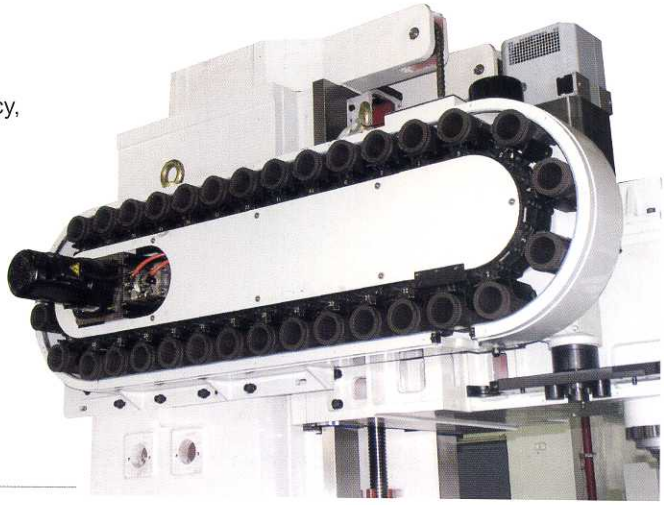
ATC for VMC-1300 ISO40, 32 tools



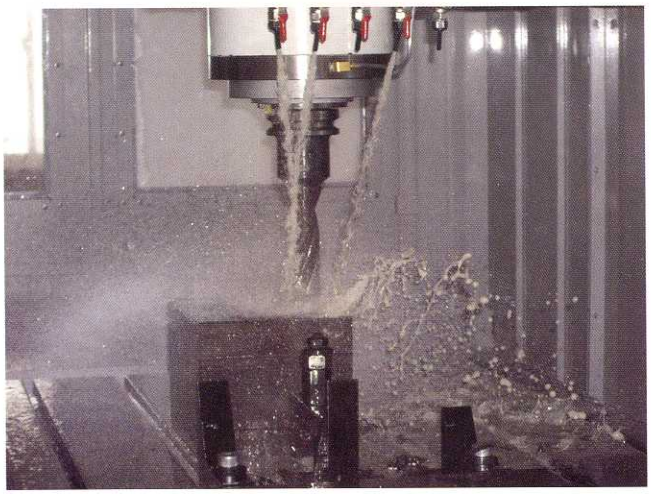
ATC for VM-1000 ISO40, 24 tools

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 achived 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

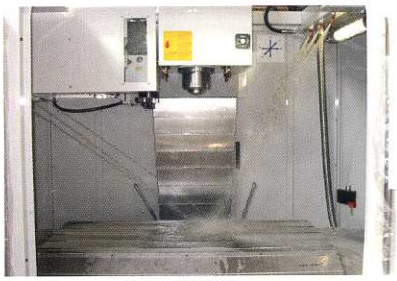


ATC for VMC-1600/2100 ISO50, 32 tools



Chip Removal

- 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.)



20 bar or 70 bar 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 0iMD 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

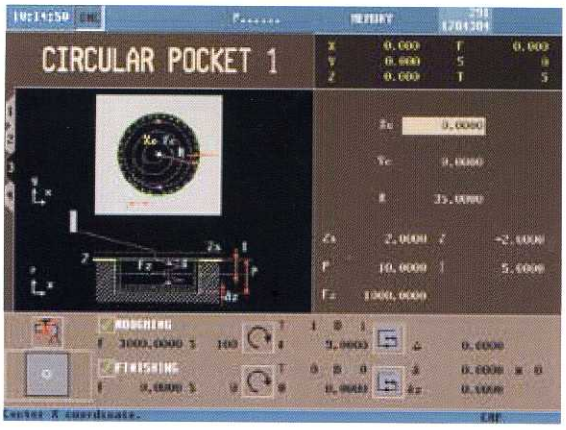
Integrated Operation & Programming Guidance with extremely simplified operations

FANUC MANAUL GUIDE i.....

- Programming Guidance
- With extremely simplified operations

FANUC MANUAL GUIDE 0i.....

Integrated Operation Guidance for NC program



ICON conversational language

FAGOR CONTROL

FAGOR 8055 POWER CONTROL

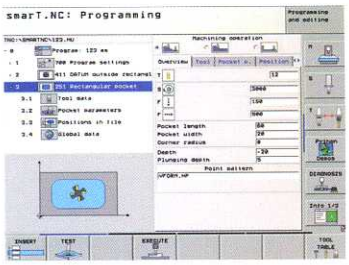
- High speed machining, large look-ahead buffer (200 blocks) and a high speed block processing tim (capable of up to 1 millisecond).
- Graphically assisted set up user interfaces
- Preparation help on tool management
- Various programming language provides improved operator ease & efficiency:

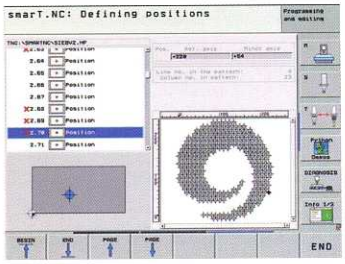
--Wide range of ICON conversational cycles

--ISO-code language

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

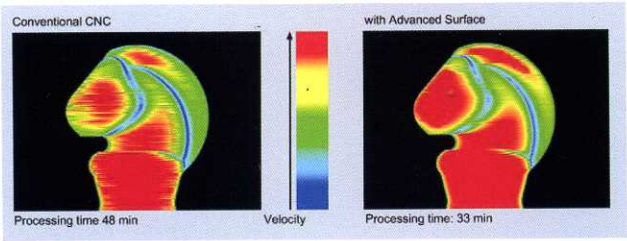




SIEMENS CONTROL

SIEMENS SINUMERIK 828D CONTROL

- Easy data exchange thanks to USB, CF and Ethernet interfaces on the panel front
- 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



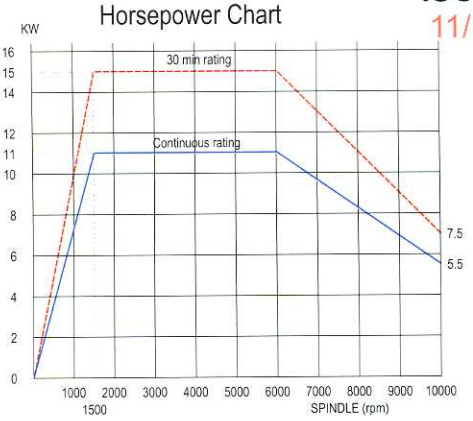
VM / VMC SERIES Horse power & Torque Chart

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

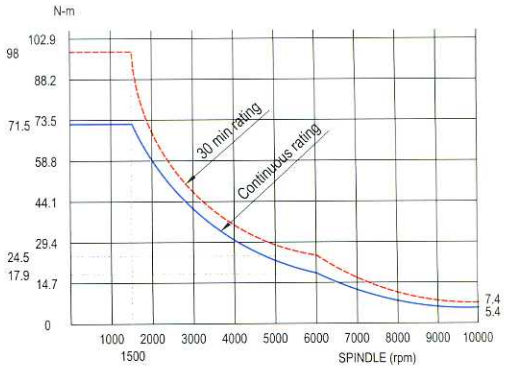
ISO40 Spindle

11/15Kw(std.)

Horsepower Chart

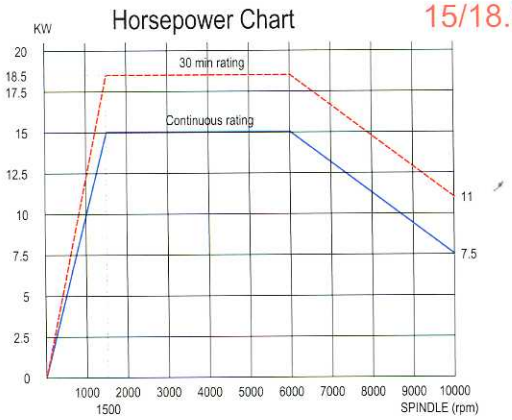


Torque Chart

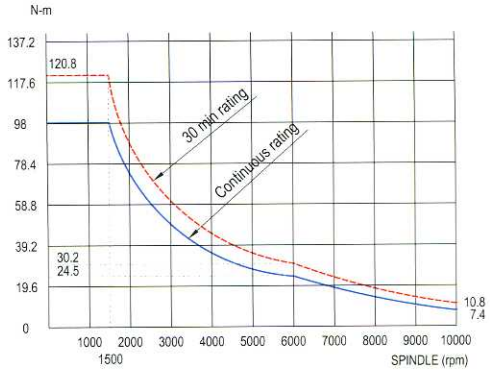


15/18.5Kw(opt.)

Horsepower Chart



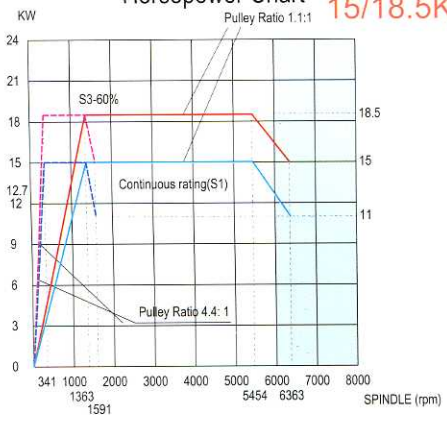
Torque Chart



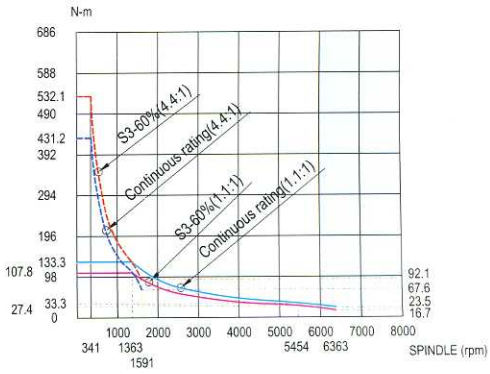
ISO50 Spindle

15/18.5Kw(std.)

Horsepower Chart

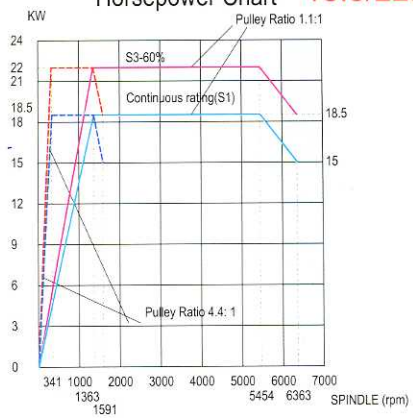


Torque Chart

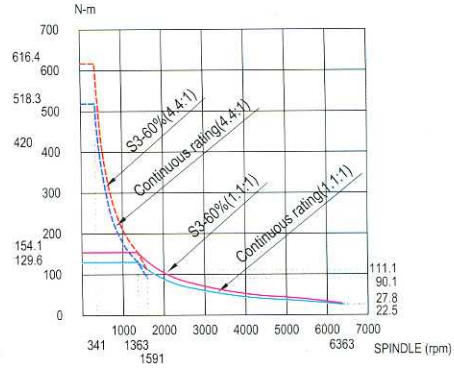


18.5/22Kw(opt.)

Horsepower Chart

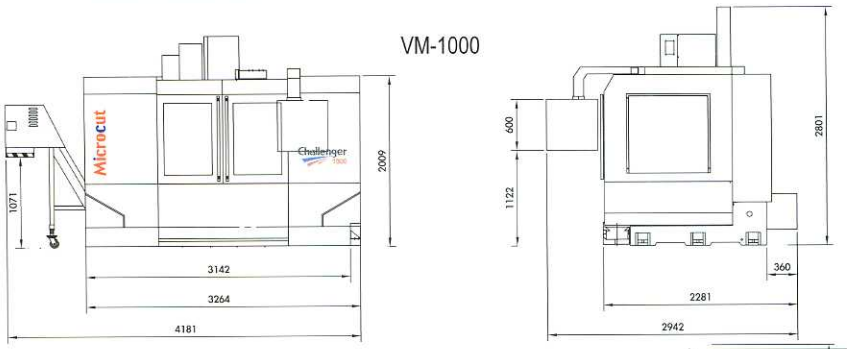


Torque Chart

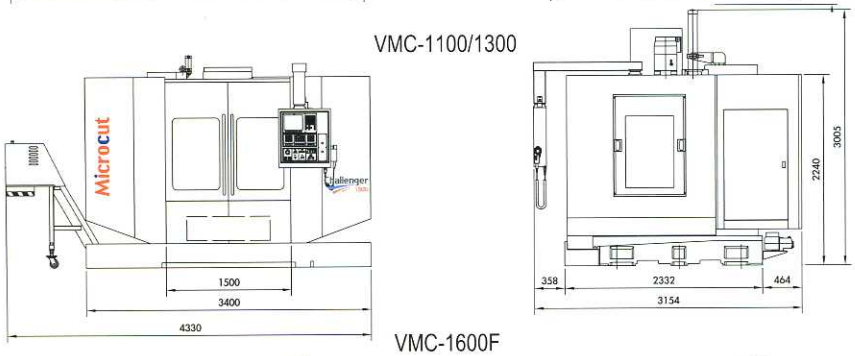


Layout

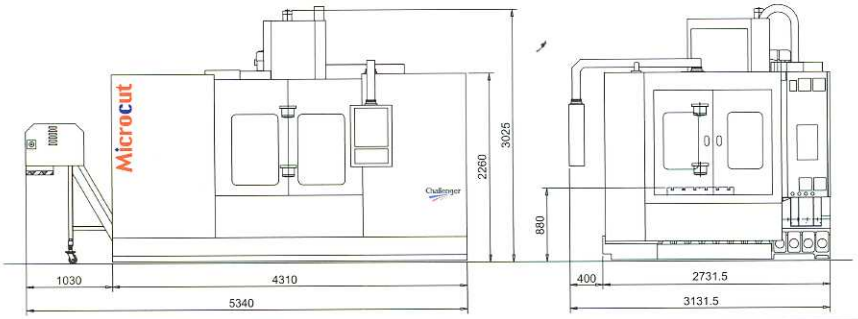
VM-1000



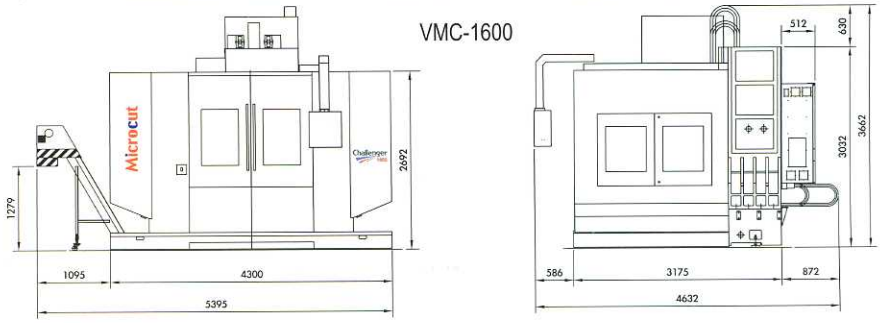
VMC-1100/1300



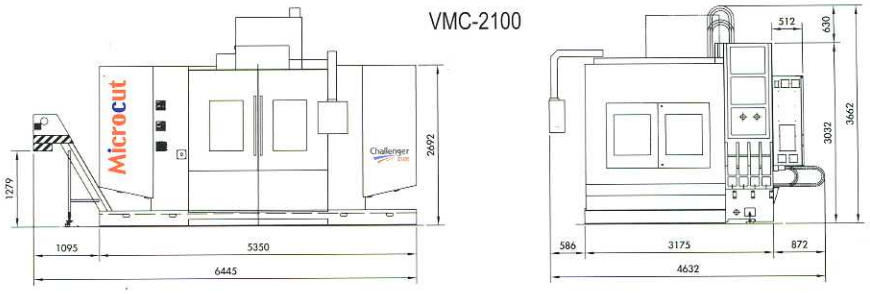
VMC-1600F



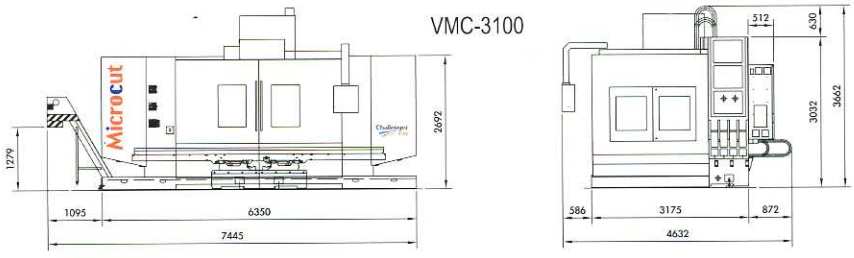
VMC-1600



VMC-2100



VMC-3100



Challenger

Specification

Description		Unit	VM-1000 Y500 / Y-600	VMC-1100	VMC-1300
TABLE					
Table size		mm	1200 x 500 / 1300 x 600	1300 x 600	1500 x 660
Distance between table & floor		mm	880	880	880
Tablle loading capacity		kg	800	1200	1200
T-slot configuration		(w/pitch/no)	16 x 86 x 5	18 x 110 x 5	18 x 135 x 5
TRAVEL					
X axis		mm	1000	1100	1300
Y axis		mm	500 / 600	710	710
Z axis		mm	570	710	710
SPINDLE					
Taper		ISO	40	40 / 50	40 / 50
Spindle bearing inside diameter		mm	70	70	70
Spindle speed - standard		rpm	10000	10000 / 6000	10000 / 6000
Spindle driven system			belt driven	ISO40-belt driven ISO50-geared head	ISO40-belt driven ISO50-geared hea
Spindle nose to table		mm	115-685	120-830	120-830
Gear ratio for gear box (ISO50)			-	1.1 : 1 4.4 : 1	1.1 : 1 4.4 : 1
AXES TRANSMISSION					
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
GUIDE WAYS					
X - width x thick x guide distance			80 x 35 x 460	90 x 40 x 480	90 x 40 x 480
Y - width x thick x guide distance			135x35x700 / 110 x 35 x 600	230 x 40 x 870	230 x 40 x 870
Z - width x thick x guide distance			80 x 35 x 300	90 x 40 x 480	90 x 40 x 480
Ballscrew Lubrication X/Y/Z			oil	oil	oil
MOTOR					
Spindle(std.)-ISO40	Siemens	KW	11/15		
	Fagor		11/15.5		
	Fanuc		11/15		
	Heidenhain		10/15		
Spindle(std.)-ISO50	Siemens	KW	n/a	15/20	
	Fagor		n/a	17/25	
	Fanuc		n/a	15/18.5	
	Heidenhain		n/a	15/20	
X axis	Siemens	Nm	16	18	
	Fagor		16.5	16.5	
	Fanuc		20	20	
	Heidenhain		18.1	18.1	
Y axis	Siemens	Nm	16	18	
	Fagor		16.5	16.5	
	Fanuc		20	20	
	Heidenhain		18.1	18.1	
Z axis	Siemens	Nm	11	18	
	Fagor		27.3	27.3	
	Fanuc		20	20(ISO40); 36(ISO50)	
	Heidenhain		9.9	16.3	
ATC					
Poket			24	24(ISO40/50)	32(ISO40/50)
Tool taper			BT#40 / CAT#40 / DIN69871	BT#40 / CAT#40 / DIN69871	BT#40 / CAT#40 / DIN69871
ATC time (T-T)			4	4	4
Max. tool weight		kg	8	7 (ISO40), 15 (ISO50)	7 (ISO40), 15 (ISO50)
Max. tool diameter(full load)		mm	ø75	ø76 (ISO40), ø125 (ISO50)	ø76 (ISO40), ø125 (ISO50)
Max. tool diameter(every next tool)		mm	ø150	ø120 (ISO40), ø250 (ISO50)	ø120 (ISO40), ø250 (ISO50)
Max. tool length			300	300	300
ACCURACY					
Positioning accuracy		mm	±0.005 / 300	±0.005 / 300	±0.005 / 300
Repeatability		mm	0.005	0.005	0.005
COOLANT PUMP FOR NOZZLE AROUND SPINDLE					
Pump motor		W	410	900	900
Coolant tank capacity		L	340	520	520
Max. coolant pressure		kg/cm2	1.5	4.5	4.5
Pressure under normal usage			1		
Max. coolant flow		L/min	80	100	100
Flow under normal usage					
COOLANT PUMP FOR WASH DOWN (OPTION)					
Pump motor		W	850	900	900
Max. coolant pressure		kg/cm2	2.8	4.5	4.5
Pressure under normal usage			2		
Max. coolant flow		L/min	130	100	100
Flow under normal usage					
LUBRICATION PUMP					
Pump motor		W	220V / 1PH / 0.5A	25	25
Pump flow rate		cc/sec.	2.2	0.13	0.13
Pump pressure		bar	8	15	15
Tank capacity		liter	2	2.5	2.5
Lub. Period				0-12min.(working); 5 sec.-180min.(break)	0-12min.(working); 5 sec.-180min.(brea
Distributor type			volumetric	pressure release	pressure release
Oil type			#68	#68	#68
PNEUMATIC					
Air pressure		bar	6.5	6.5	6.5
Air consumption		L/min.	400	400	400
MISCELLANEOUS					
Dimension - L x W x H		M	3.3 x 2.9 x 2.8	3.4 x 3.2 x 3.0	3.4 x 3.2 x 3.0
Dimension - L x W x H (with chip conveyor)			4.2 x 2.9 x 2.8	4.3 x 3.2 x 3.0	4.3 x 3.2 x 3.0
Weight		kg	5500	7300	7800
Max. power consumption		KVA	35	35	35

VMC-1600F	VMC-1600	VMC-2100	VMC-3100
1800 x 800	1900 x 900	2400 x 900	3400 x 900
880	1000	1000	1000
2000	2000	2500	3000
18 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
70	70	70	70
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
120-830	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:50 x P12 x C3; Z:40 x P12 x C3	D63 x P12 x C3	D63 x P12 x C3	D63 x P12 x C3
Direct	Direct	Direct	Direct
18	20 / 20 / 18	20 / 20 / 18	20 / 20 / 18
10	10	10	10
90 x 40 x 600	100 x 50 x 580	100 x 50 x 580	
90 x 40 x 690 (inside) / 1450 (outside)	150 x 50 x 1680, 100 x 50, 4	150 x 50 x 1680, 100 x 50, 4	
90 x 40 x 480	130 x 50 x 730	130 x 50 x 730	
oil	oil	oil	
	15/20		
	15/22		
	15/18.5		
	15/20		
	18.5/24		
	18.5/26		
	18.5/22		
	20/33		
	48		
	39.7		
	36		
	39		
	48		
	39.7		
	36		
	39		
	48		
	39.7		
	36		
	27.5		
24 (ISO40) / 32 (ISO40/50, option)	40 (ISO40), 32 (ISO50)		
BT / CAT / DIN	BT / CAT / DIN		
4	4		
7 (ISO40), 15 (ISO50)	7 (ISO40), 15 (ISO50)		
ø76 (ISO40), ø125 (ISO50)	ø76 (ISO40), ø127 (ISO50)		
ø120 (ISO40), ø250 (ISO50)	ø120 (ISO40), ø228 (ISO50)		
300	300		
±0.005 / 300	±0.005 / 300		
0.005	0.005		
900	1250	1250	1250
520	640	640	640
4.5	3.75	3.75	3.75
100	150	150	150
900	1580	1580	1580
4.5	5	5	5
100	135	135	135
25	220V / 1PH / 0.5A	220V / 1PH / 0.5A	220V / 1PH / 0.5A
0.13	2.2	2.2	2.2
15	8	8	8
2.5	2	2	2
0-12min.(working); 5 sec.-180min.(break)		0-12min.(working); 5 sec.-180min.(break)	
pressure release	volumetric	volumetric	volumetric
#68	#68	#68	#68
6.5	6.5	6.5	6.5
400	400	400	400
4.3 x 3.1 x 3.0	4.3 x 4.6 x 3.7	5.4 x 4.6 x 3.7	7.4 x 4.6 x 3.7
5.3 x 3.1 x 3.0	5.2 x 4.6 x 3.7	6.2 x 4.6 x 3.7	8.1 x 4.6 x 3.7
12000	22000	22500	23000
50	50	50	50

Standard Features

- •CNC control
- • Z axis with upgraded motor & built-in brake
- • High speed precision spindle at 10000rpm For ISO40, 6000rpm for ISO50
- • Rigid tapping function
- • Arm type ATC
- • Box sliding way for axes
- • Telescopic way 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
- • Instruction manual & parts list
- • Lamp of cycle finish and alarm

Optional Features

- • Enlarge spindle motor
- • Coolant through spindle with high pressure pump
- • Wash down device
- • Chip conveyor & bucket
- • Heat exchanger
- • Air conditioner
- • EMC
- • 4th axis rotary table
- • 4th/5th axis rotary table
- • Oil skimmer
- • Spindle oil cooler
- • Tool setting probe
- • Work piece measuring probe
- • Special machine color on request

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