

Challenger

Microcut



**Vertical Machining
Center**



Material: Aluminum Part Dimension: 200x150x50/mm

Tool	Feed mm/min	Cutting speed min ⁻¹	Cutting width radial mm	Cutting depth axial mm	Cutting time min
D10R1	3000	12000	5	0.3	47
D4R2	2000	12000	0.4	0.25	53
D4R2	2000	12000	0.16	0.11	86
D2R1	1600	24000	0.04	0.08	402
D2R1	1600	24000	0.025	0.05	212



Material: Aluminum Part Dimension: ø100x50/mm

Tool	Feed mm/min	Cutting speed min ⁻¹	Cutting width radial mm	Cutting depth axial mm	Cutting time min
D20	8000	6000	15	0.5	14
D12R3	700	4000	4	0.1	4
D12R3	4000	10000	0.1	0.24	8
D6R3	3000	10000	0.24	0.26	18
D1R0.5	500	10000	0	0.05	3



Material: Mould Steel Part Dimension: 50x50x50/mm

Tool	Feed mm/min	Cutting speed min ⁻¹	Cutting width radial mm	Cutting depth axial mm	Cutting time min
D6R3	2000	8000	—	—	12
D6R3	3000	12000	—	—	23



Material: Aluminum Part Dimension: 400x400x50/mm

Tool	Feed mm/min	Cutting speed min ⁻¹	Cutting width radial mm	Cutting depth axial mm	Cutting time min
D20	5000	9000	10	0.5	36
D6R3	3000	8000	0.4	0.3	33
D4R2	2500	10000	0.2	0.11	116
D8R4	3500	8000	0.2	0.1	144
D4R2	2500	10000	0.12	0.1	34



Dynamic test table



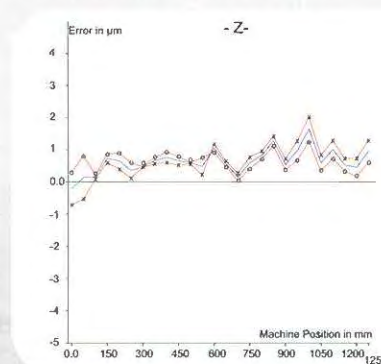
Hardness test

All bearing surfaces are hardened and minimum hardness HRC52-55.

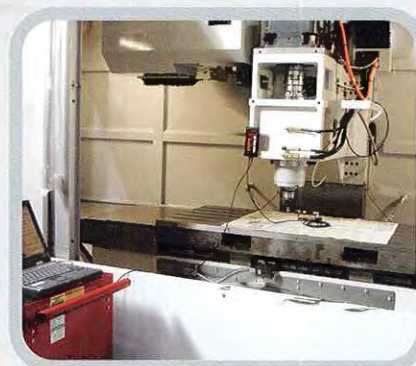


Laser inspection

The full scale stroke is inspected and compensated by Laser measurement instrument. The motion accuracy can be ensured.



Laser report



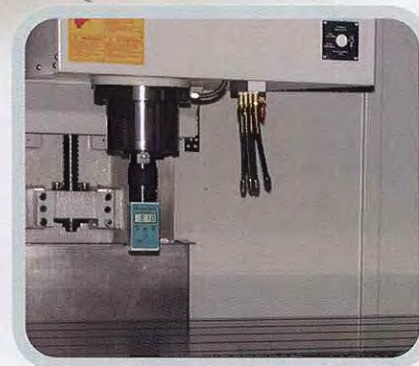
Ball bar inspection

The renishan ball bar instrument calibrates the circularity and the geometrical accuracy to ensure the precision three dimensional motions.

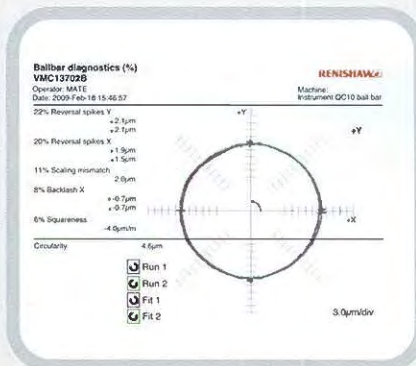


Noise test

Distance from machine minimum 1 meter

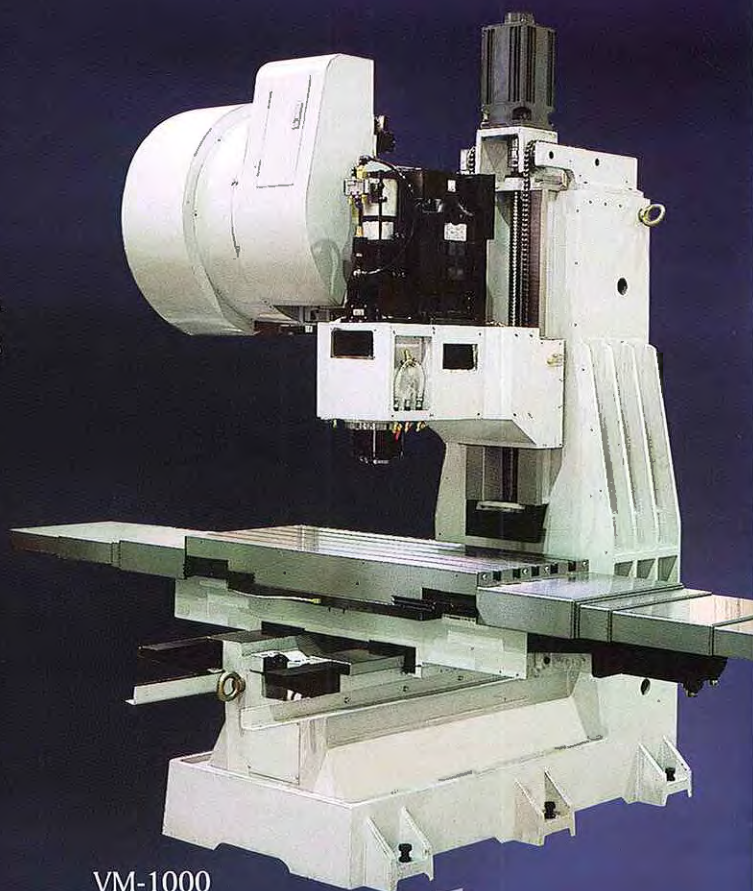


Tool clamping force measurement

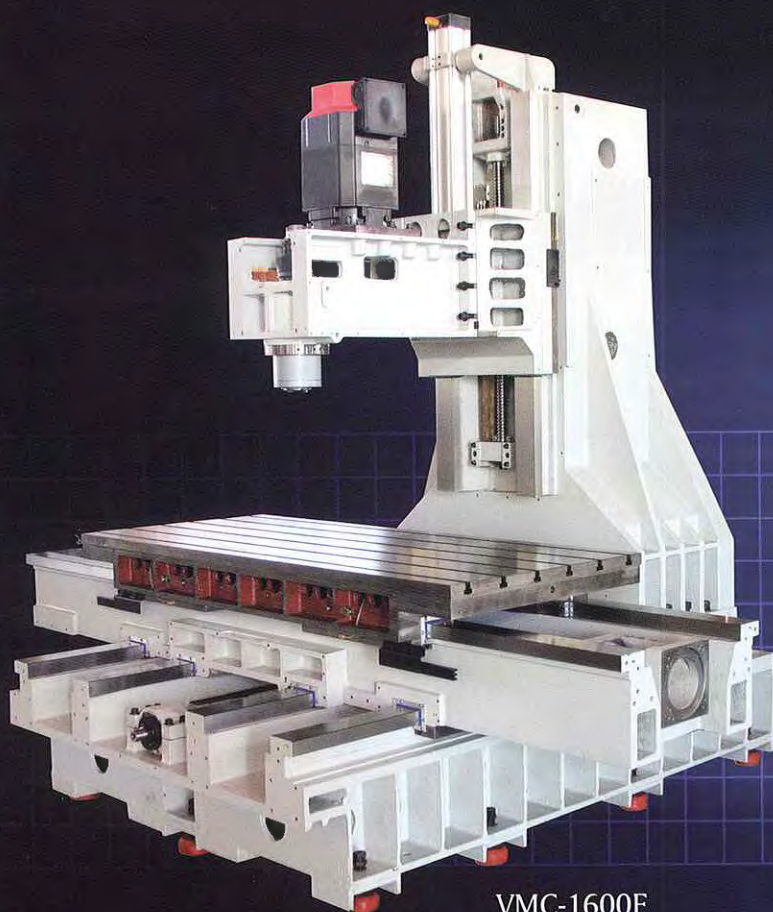


Ball bar report

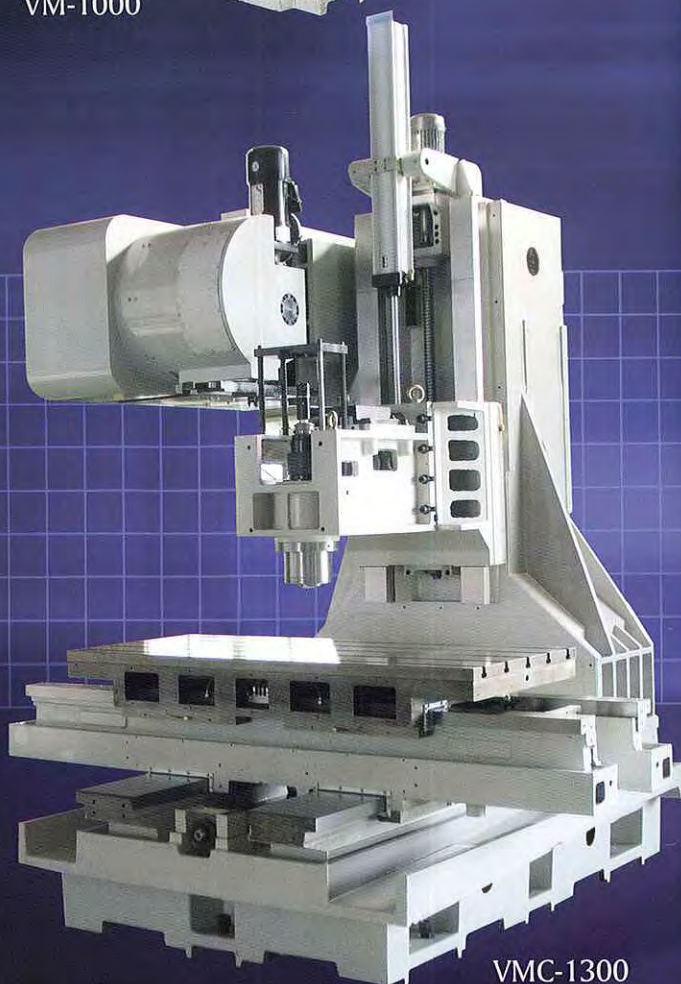
- The major structural components are Meehanite Licensed casting and Heat treated to relieve stress thereby assuring maximum rigidity and accuracy.
- The base incorporates a durable ribbed box design for maximum rigidity.
- Hardened and precision ground ways on the 3 main axes. Way bearing surface are plated with Turcite B for smooth and stable movement.
- Wide base, box shaped column, enhanced saddle and fully supported workpiece structure all contribute to the ability for heavy duty machining.
- Craftsmanship in hand scrapping ensures high quality and attention to detail in manufacturing process.



VM-1000



VMC-1600F



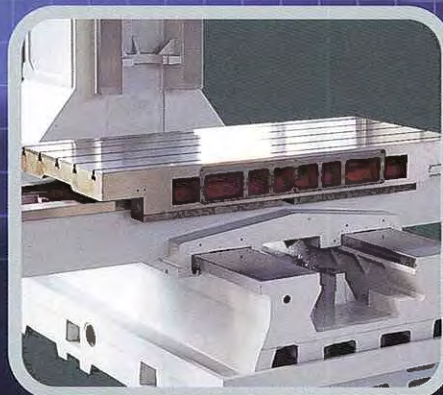
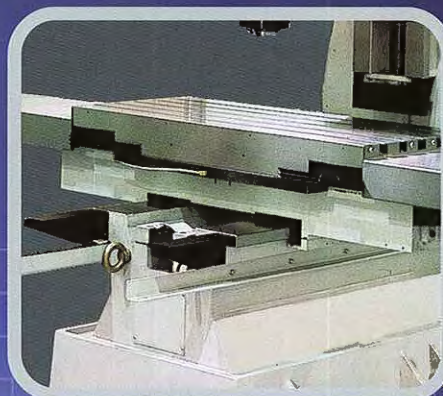
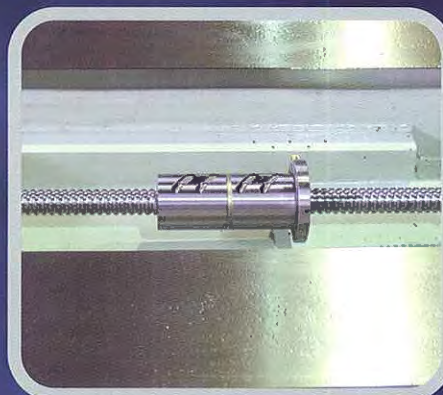
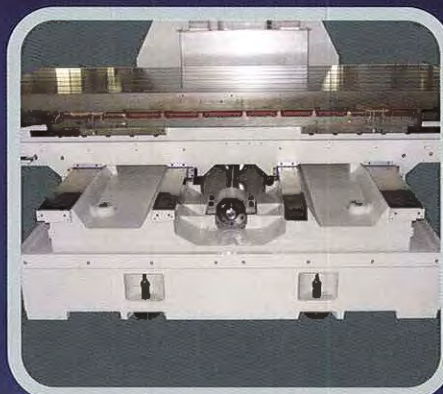
VMC-1300

Guide ways

- Four Y-axis on VMC-1600F/VMC-1600/2100, SIX guideways on VMC-3100
- Extremely wide guide ways on all series of products
- Two Y-axis guide ways on VM-1000, VMC-1100, VMC-1300.
- Mechanical counter weight on VM-1000, VMC-1600/2100/3100
- Pneumatic counter weight on VMC-1100/1300, VMC-1600F

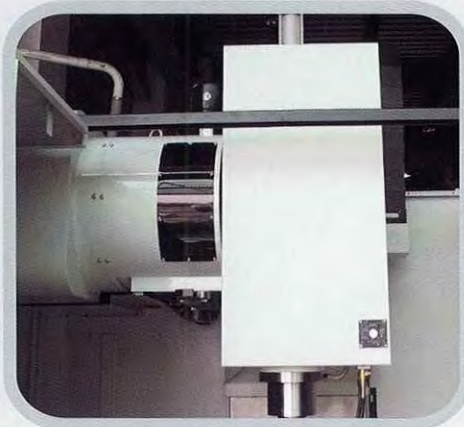
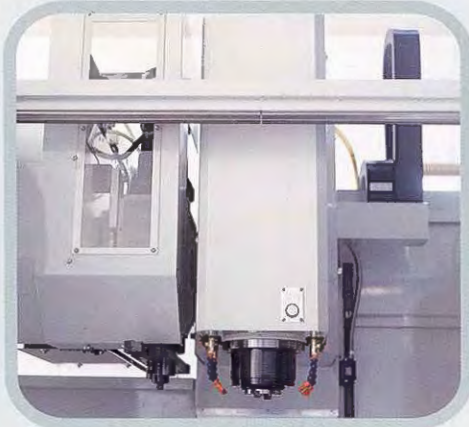
Ballscrew

Large diameter pre-tensioned ballscrews equip with double nut.



Spindle dynamic balancing

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



High speed 10000rpm(std.) or 12000rpm(opt.) spindle for ISO 40 taper.

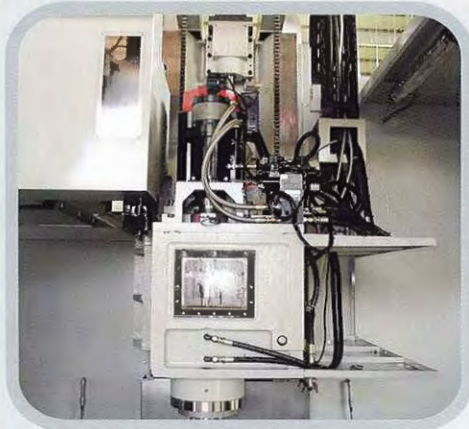
Geared Head *for ISO 50 taper*

Available on VMC-1100/1300/1600F/1600/2100/3100.

With maximum 6000rpm spindle speed by ISO50 spindle .

Two steps gear ratio 1.1:1 4.4:1.

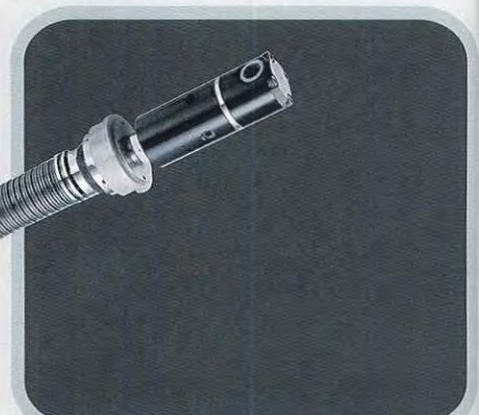
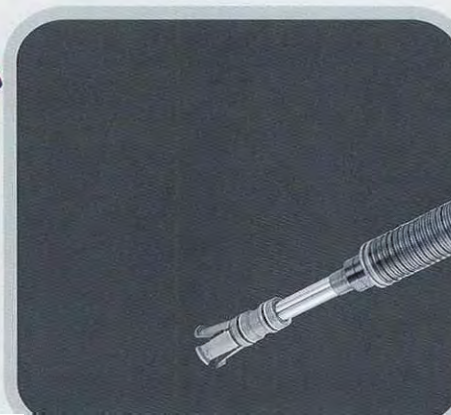
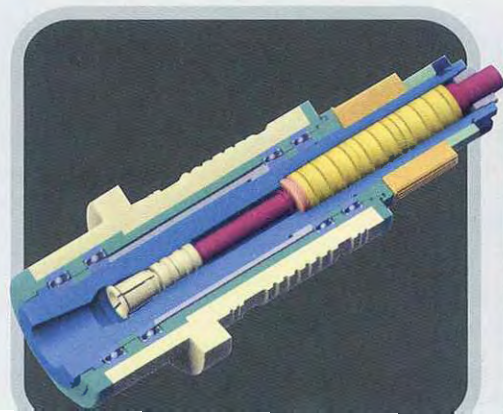
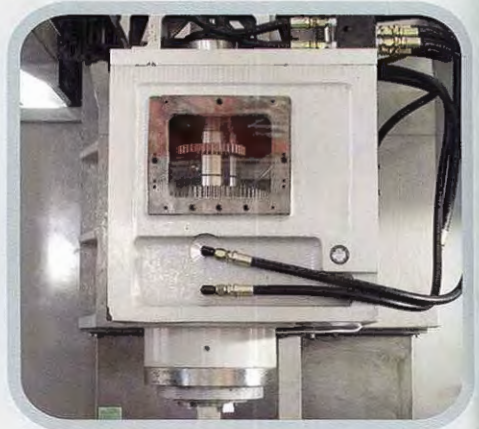
Geared box is dynamic balanced by testing run on inspection table before assembly.

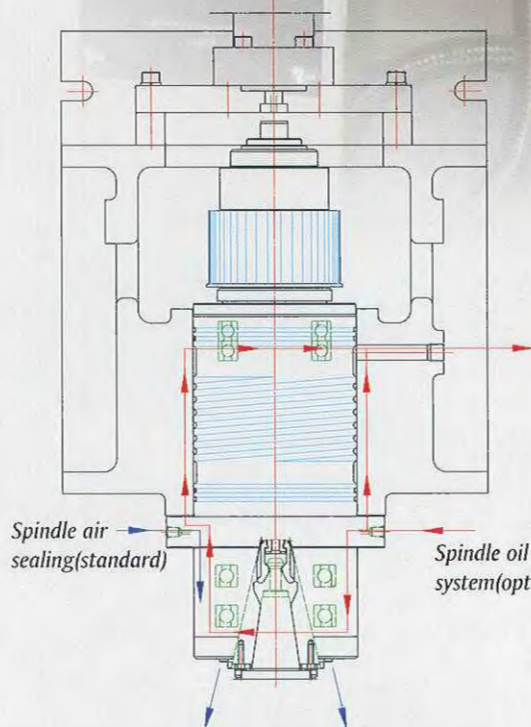


Gear Box



Gears





Spindle oil cooler

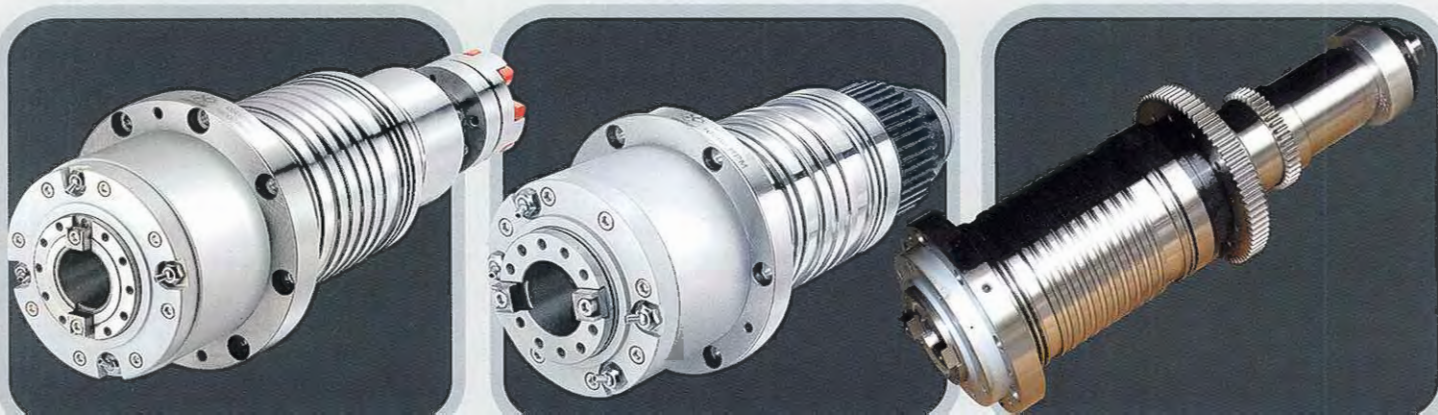
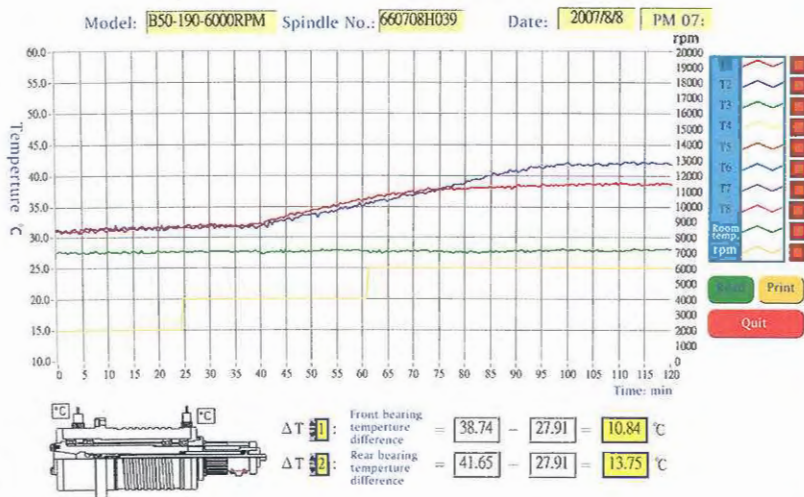
The cooling system assures spindle accuracy permanently and extends the service life of spindle. Thermal decrease set up



Geared head balancing procedure

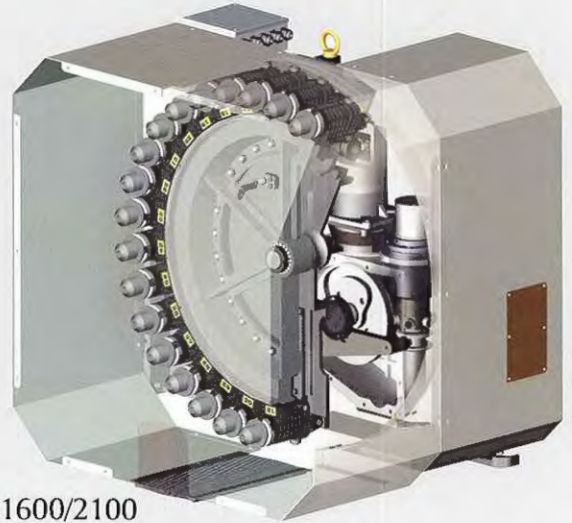
Spindle temperature tracing

Spindle Running Test Report



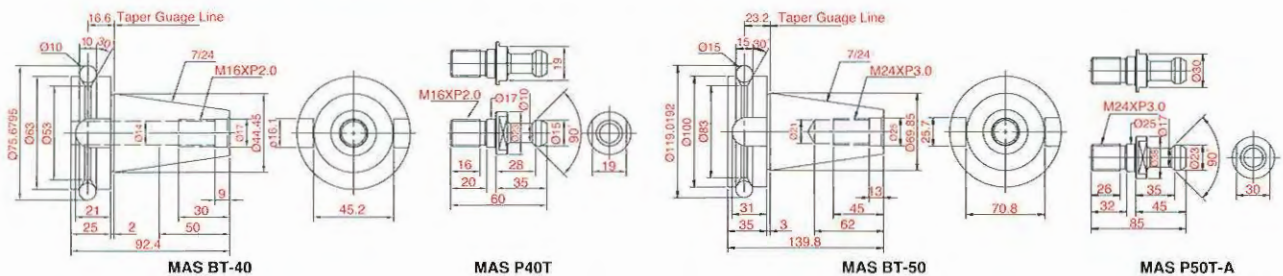
ATC

- The fast, simple and long-life automatic tool changer provides stable and reliable tool change.
- The innovative cam driven mechanism results in the unique ATC. The bi-directional tool selection is achieved by PLC software programming.
- The cam driven tool magazine (standard on all models except VM-1000) ensures rotation accuracy, and smooth motion while full tools loading.
- For VM-1000, pneumatic driven arm as standard, cam driven arm on request.
- ISO40: 24 tools for VM-1000/VMC-1100/VMC-1600F, 32 tools for VMC-1300/VMC-1600F, 40 tools for VMC-1600/2100
- ISO50: 32 tools for VMC-1100/1300/1600F/1600/2100

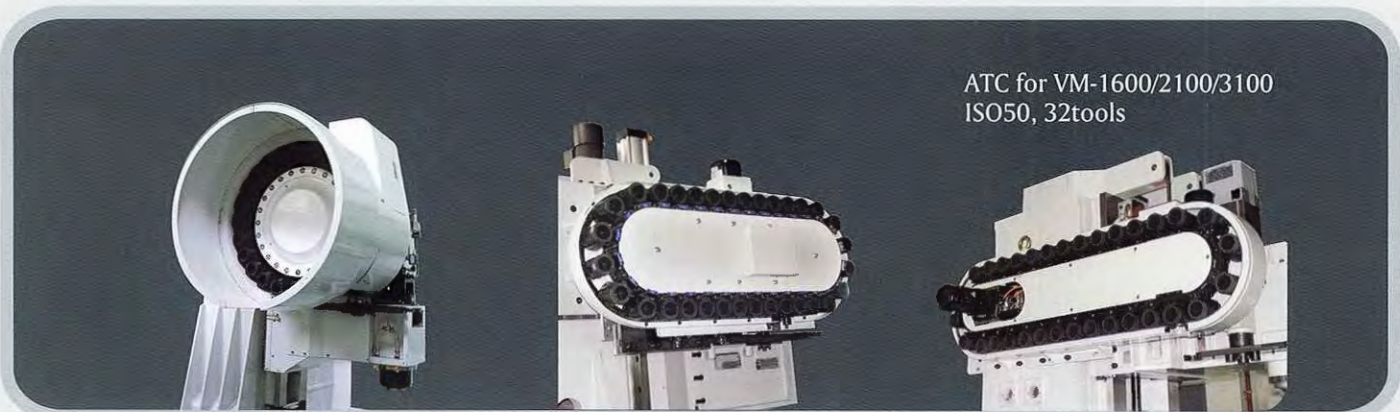
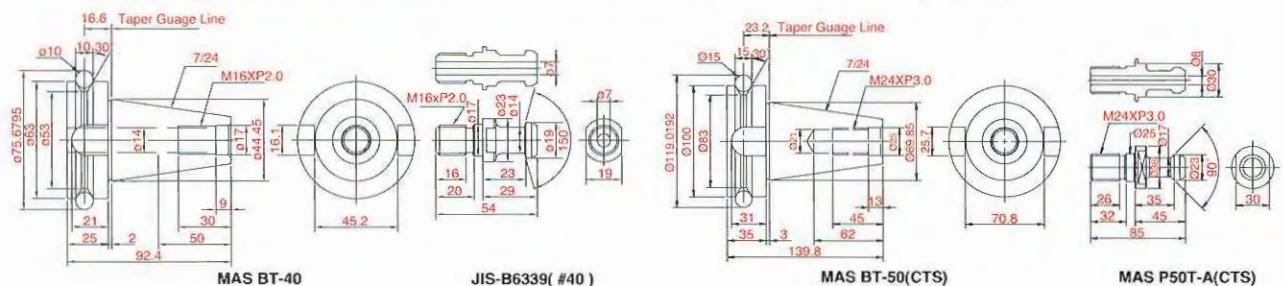


Tooling Dimension For standard machine

Data for BT, for CAT & DIN, please contact with us.



Tooling Dimension For machine with CTS (opt.)



ATC for VM-1000 ISO40, 24tools

ATC for VMC-1100/1300/VMC-1600F ISO40, 32tools

ATC for VM-1600/2100/3100
ISO50, 32tools

Chip Removal

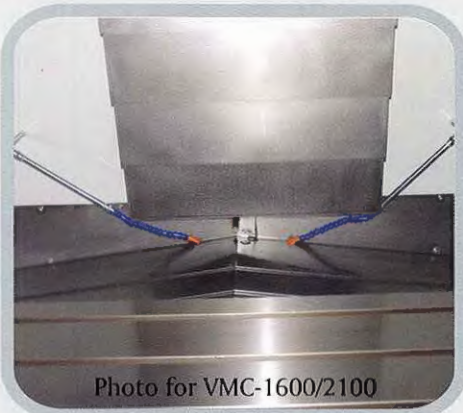


Photo for VMC-1600/2100

Rear wash down with high pressure pumps

- 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.)
 - Coolant through spindle with 20 bar or 70 bar high pressure (opt.)



Top wash down(opt.)



Photo for VMC-1100/1300

Rear wash down with high pressure pumps



Chip auger on VMC-1600/2100(std.)



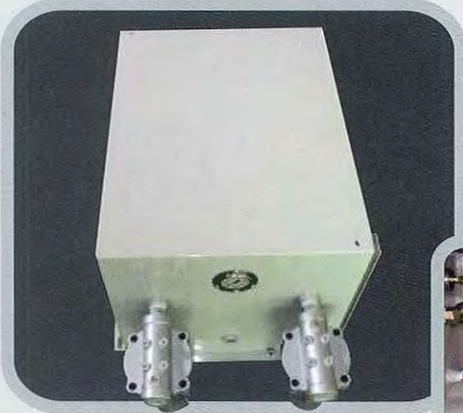
Coolant nozzle around spindle
(photo for VMC-1600/2100)



High pressure pump



CTS with individual coolant tank



CTS built-in type



Wide open doors

Two side cabinet window can be fully opened and width is exactly more than Y axis stroke. Table height is higher than window height.



Wide open doors (photo for VMC-1600)

Challenger

CONTROLLER



VMC-1000



VMC-1300

CONTROLLER	FAGOR				FANUC		Siemens			HEIDENHAIN
CPU TYPE	8055i A	8055i PLUS	8055/A	8055/PLUS	0iMC	18iMB	820D SL	810DE	840DE	iTNC530
	COMPACT	COMPACT	Modular	Modular						
MONITOR	10.4"TFT	10.4"TFT	10.4"TFT	10.4"TFT	8.4"TFT(std.) 10.4"TFT(opt.)	10.4"TFT	10.4"TFT	10.4"TFT (OP032S) PCU20	10.4"TFT (OP032S) PCU50	15"TFT
Block Process Time	9ms	3ms	9ms	3ms	8ms(std.) 4ms(opt.)	2ms(std.) 0.4ms(opt.)	9ms	4ms(std.)	2ms(std.)	3.6ms,0.5ms with software option 2
(with CPU TURBO card)	NO	NO	YES	YES			NO	NO	NO	
RAM(part program memory)	256KB	1MB	256KB	1MB	256KB	512KB(std.) 1MB(opt.)	3M	2.5M Max. up to 6M	3M Max. up to 6M	512KB(std.) 30GB on hard disk(opt.)
	Option: 1MB		Option: 1MB							
MEN-KEY-CARD	CF card	CF card	CF card	CF card	Option:Data Server (ATA card)	Standard:Data Server (ATA card)	CF card	PCU20:ATA card PCU50:Hard disk	PCU20:ATA card PCU50:Hard disk	
Flash memory for programs, PLC, tables, parameters.	(512 MB memory flash) 2GB OPTION				128MB up to 2GB(opt.)	128MB up to 2GB(opt.)				
Position in loop	Minimum:4ms	Minimum:3ms	Minimum:4ms	Minimum:3ms			9ms	4ms	2ms	
Maximum axis	4	7(with digital interface)	4	7(with digital interface)	4	8	4+1 3+2	5+1 4+2	31	5(std.), 13(opt.)
RTCP software option	NO	Option	NO	Option						
USB interface	STD	STD	NO	NO	NO	NO	STD	STD	STD	STD
ETHERNET	STD	STD	STD	STD	OPT	STD	STD	STD	STD	STD



VMC-1600F

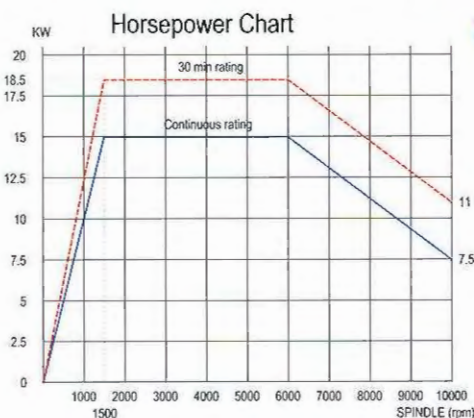
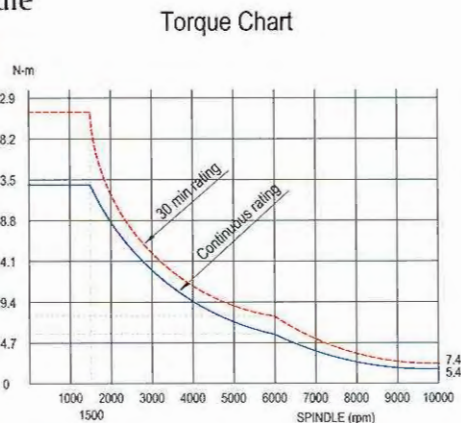
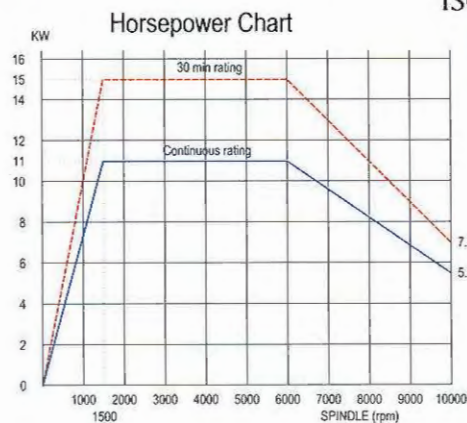


VM-1600/2100

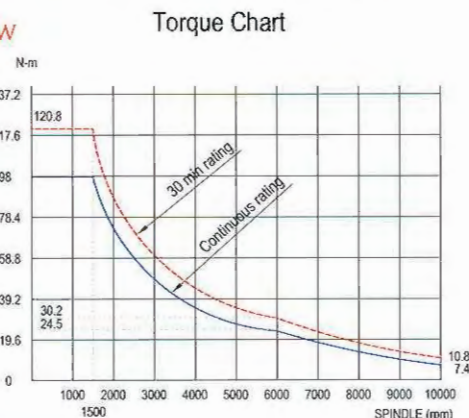
VM / VMC SERIES Horse power & Torque Chart (below data is for FANUC spindle motor, for other controller please contact us)

ISO40 Spindle

11/15Kw

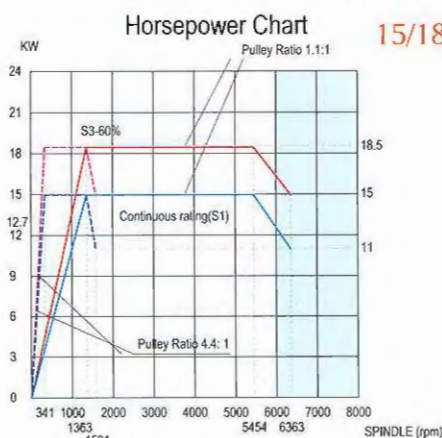


15/18.5Kw

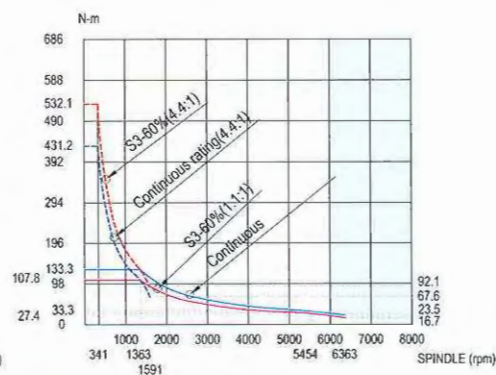


ISO50 Spindle

15/18.5Kw

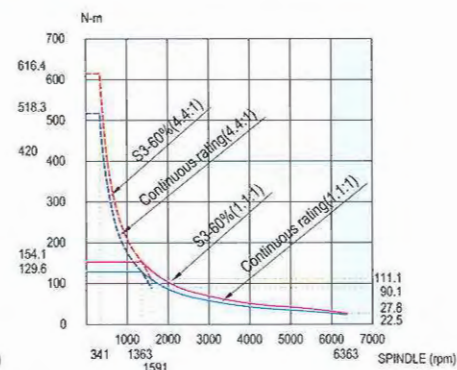


Torque Chart



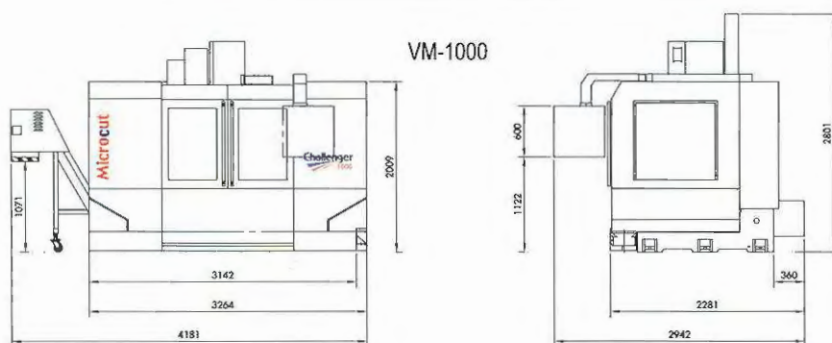
18.5/22Kw

Torque Chart

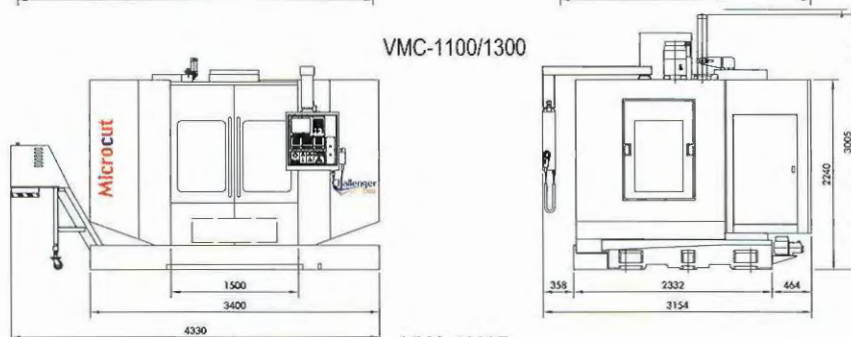


Layout

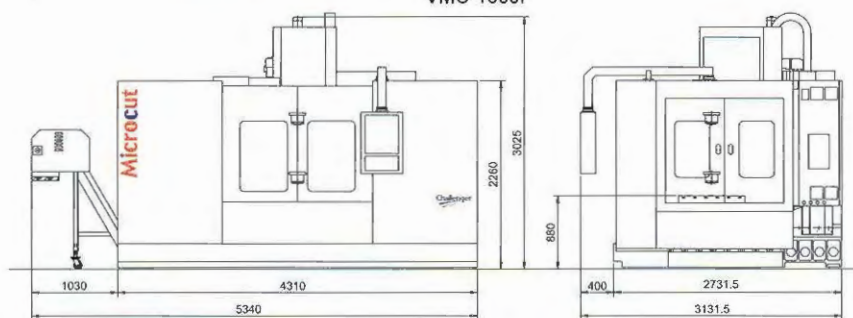
VM-1000



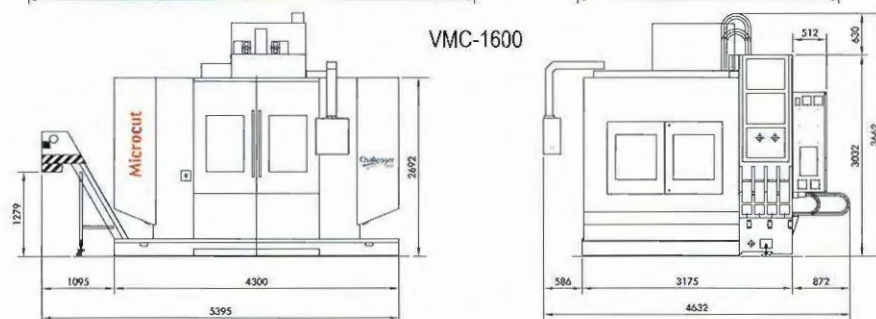
VMC-1100/1300



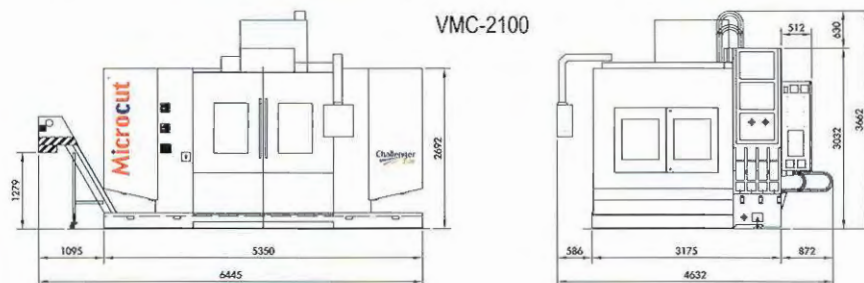
VMC-1600F



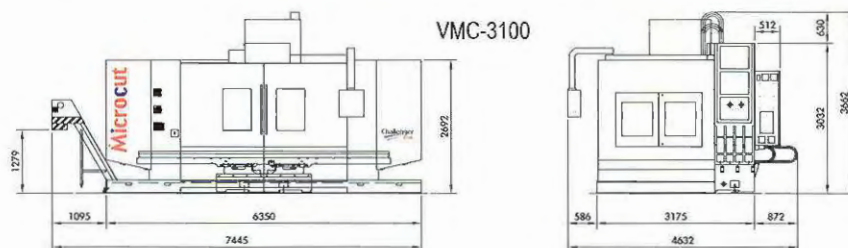
VMC-1600



VMC-2100



VMC-3100



Specification

Description	Unit	VM-1000 / Y-600	VMC-1100	VMC-1300
TABLE				
Table size	mm	1300 x 600	1200 x 660	1500 x 660
Distance between table & floor	mm	880	850	880
Table 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	600	650	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 speed - option	rpm	12000	12000 (#40)	12000 (#40)
Spindle driven system		belt driven (standard) 12000rpm Inline direct (option)	belt driven (standard) 12000rpm Inline direct (option)	belt driven (standard) 12000rpm Inline direct (option)
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				
XY/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		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 XY/Z		oil	oil	oil
MOTOR (below figure is for Fanuc)				
Spindle	KW	12/16 (Siemens); 11/15 (Fagor); 11/15 (Fanuc)	12/16 (Siemens); 11/15 (Fagor); 11/15 (Fanuc)	12/16 (Siemens); 11/15 (Fagor); 11/15 (Fanuc)
X axis	Nm	16 (Siemens); 14.8 (Fagor); 12 (Fanuc)	16 (Siemens); 14.8 (Fagor); 12 (Fanuc)	16 (Siemens); 14.8 (Fagor); 12 (Fanuc)
Y axis	Nm	27 (Siemens); 14.8 (Fagor); 22 (Fanuc)	27 (Siemens); 14.8 (Fagor); 22 (Fanuc)	27 (Siemens); 14.8 (Fagor); 22 (Fanuc)
Z axis	Nm	27 (Siemens); 27.3 (Fagor); 22 (Fanuc)	27 (Siemens); 27.3 (Fagor); 22 (Fanuc)	27 (Siemens); 27.3 (Fagor); 22 (Fanuc)
ATC				
Pocket		24	24	32
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	7
Max. tool diameter(full load)	mm	ø75	ø76	ø76
Max. tool diameter(every next tool)	mm	ø150	ø150	ø150
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.(break)
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

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
12000 (#40)	12000 (#40)	12000 (#40)	12000 (#40)
belt driven (standard)	belt driven (standard)	belt driven (standard)	belt driven (standard)
12000rpm Inline	12000rpm Inline	12000rpm Inline	12000rpm Inline
direct (option)	direct (option)	direct (option)	direct (option)
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 1650, 100 x 50, 4	150 x 50 x 1650, 100 x 50, 4	
90 x 40 x 480	130 x 50 x 730	130 x 50 x 730	
oil	oil	oil	
15/18.5 (Fanuc)-#40; 18.5/22 (Fanuc)-#50	15/18.5 (Fanuc)-#40; 18.5/22 (Fanuc)-#50	15/18.5 (Fanuc)-#40; 18.5/22 (Fanuc)-#50	15/18.5 (Fanuc)-#40; 18.5/22 (Fanuc)-#50
4.2/30 (Fanuc)	3/22 (Fanuc)	3/22 (Fanuc)	3/22 (Fanuc)
4.2/30 (Fanuc)	3/22 (Fanuc)	3/22 (Fanuc)	3/22 (Fanuc)
4.2/30(Fanuc)	4.2/30(Fanuc)	4.2/30(Fanuc)	4.2/30(Fanuc)
24 (ISO40) / 32 (ISO40/50, option)	40 (ISO40), 32 (ISO50)		
BT / CAT / DIN	BT / CAT / DIN		
4	4		
7 (ISO40), 20 (ISO50)	7 (ISO40), 20 (ISO50)		
ø76 (ISO40), ø127 (ISO50)	ø76 (ISO40), ø127 (ISO50)		
ø150 (ISO40), ø229 (ISO50)	ø150 (ISO40), ø229 (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	6.4 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