

MITSEIKI



ISO 14001



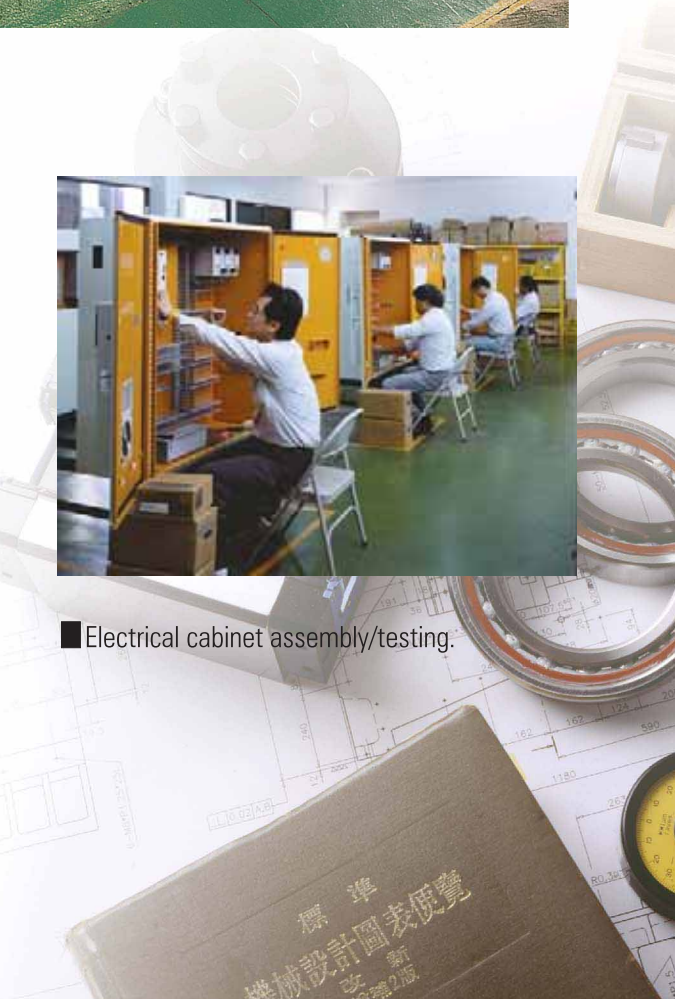
ISO 9001



VERTICAL MACHINING CENTERS



RON MACK
MACHINERY



5





■ Precision assembly.



■ Precision spindle assembly and running testing.



MITSEIKI Vertical Machine Tools



CV-600

Travel(X,Y,Z):600/410/540mm
Rapid speed(X,Y,Z):36/36/24m/min
Table size:700x400mm
Tool shank: CAT/BT-40



CV-800

Travel(X,Y,Z):800/500/540mm
Rapid speed(X,Y,Z):24/24/20m/min
Table size:910x500mm
Tool shank: CAT/BT-40



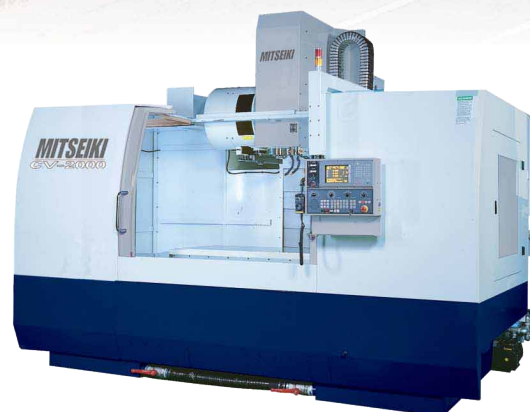
CV-1000

Travel(X,Y,Z):1000/560/600mm
Rapid speed(X,Y,Z):24/24/20m/min
Table size:1100x560mm
Tool shank: CAT/BT-40



CV-1600

Travel(X,Y,Z):1600/900/800mm
Rapid speed(X,Y,Z):20/20/15m/min
Table size:1700x850mm
Tool shank: CAT/BT-50



CV-2000

Travel(X,Y,Z):2000/900/800mm
Rapid speed(X,Y,Z):20/20/15m/min
Table size:2100x850mm
Tool shank: CAT/BT-50

Shining Centers



CV-1200

Travel(X,Y,Z):1200/600/675mm
Rapid speed(X,Y,Z):24/24/18m/min
Table size:1220x620mm
Tool shank: CAT/BT-50



CV-1400

Travel(X,Y,Z):1400/900/800mm
Rapid speed(X,Y,Z):20/20/15m/min
Table size:1500x850mm
Tool shank: CAT/BT-50



SV-1000

Travel(X,Y,Z):1020/600/635mm
Rapid speed(X,Y,Z):18/18/18m/min
Table size:1200x560mm
Tool shank: CAT/BT-40



MV-1000

Travel(X,Y,Z):1000/500/540mm
Rapid speed(X,Y,Z):24/24/20m/min
Table size:1000x560mm
Tool shank: CAT/BT-40



MV-1400

Travel(X,Y,Z):1400/650/675mm
Rapid speed(X,Y,Z):24/24/20m/min
Table size:1400x620mm
Tool shank: CAT/BT-40

STANDARD ACCESSORIES

HIGH RIGIDITY, HIGH ACCURACY CONSTRUCTION DESIGN

- The major construction parts are based on Meehanite cast iron. They are stable and precision-proved in structure.
- The enhanced ribs in major construction parts provide the super rigidity for heavy duty cutting or for high speed cutting.
- Wide base, box-shaped column, enhanced saddle and full supported workpiece structure all contribute to the ability for heavy duty machining.
- The reasonable length proportion is designed in between spindle center to rail and supported span at spindle head.

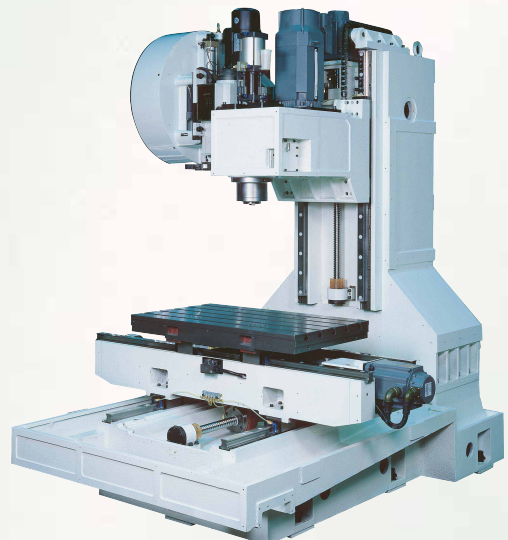


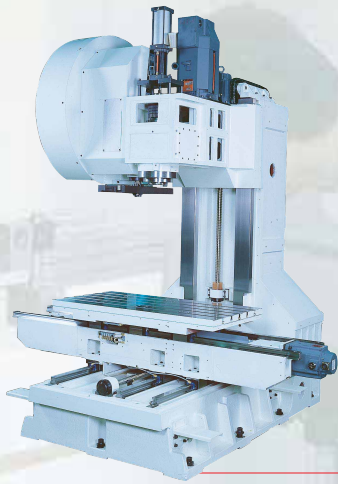
CV-800 vertical machining center

- X/Y axis adopts a heavy duty linear guide way. It ensures the characteristics of high rigidity, low noise and low friction. High speed feedrate and contour cutting accuracy are achieved.
- Feedrate is 24m/min in X/Y axis, 20m/min in Z axis.
- The ball bar measurement and parameter tuning are executed in every machine to ensure the dynamic accuracy.

CV-1000 vertical machining center

- X/Y axis adopts a heavy duty linear guide way. It ensures the characteristics of high rigidity, low noise and low friction. High speed feedrate and contour cutting accuracy are achieved.
- Feedrate is 24m/min in X/Y axis, 20m/min(linear way), 18m/min(slide way) in Z axis.
- The ball bar measurement and parameter tuning are executed in every machine to ensure the dynamic accuracy.
- In Z axis, either roller type linear guide way or slide way can be chosen for versatile cutting conditions.



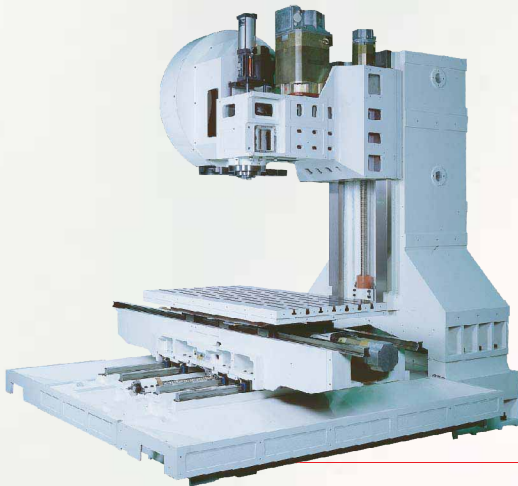
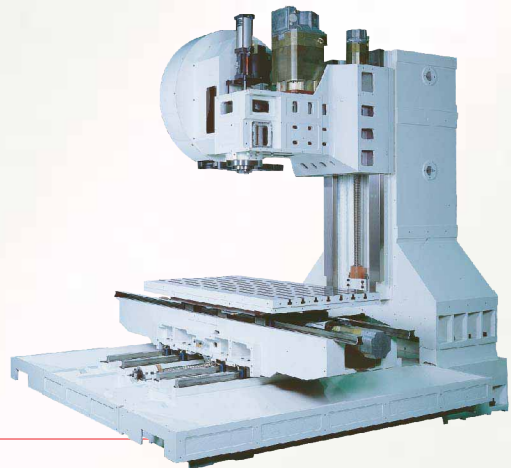


CV-1200 vertical machining center

- X/Y axis adopts a heavy duty linear guide way. It ensures the characteristics of high rigidity, low noise and low friction. High speed feedrate and contour cutting accuracy are achieved.
- Feedrate is 24m/min in X/Y axis, 20m/min(linear way), 18m/min(slide way) in Z axis.
- The ball bar measurement and parameter tuning are executed in every machine to ensure the dynamic accuracy.
- In Z axis, either roller type linear guide way or slide way can be chosen for versatile cutting conditions.
- To ensure super precision, the Y axis is enhanced by three rails.

CV-1600 vertical machining center

- The linear guide ways on X/Y axes provide high rigidity, low noise and low friction characters which contribute to fast movement and excellent cutting accuracy.
- Feedrate is 20m/min in X/Y axis, 15m/min in Z axis.
- The ball bar measurement and parameter tuning are executed in every machine to ensure the dynamic accuracy.
- In Z axis, the slide way with Turcite-B is chosen for versatile cutting capabilities.

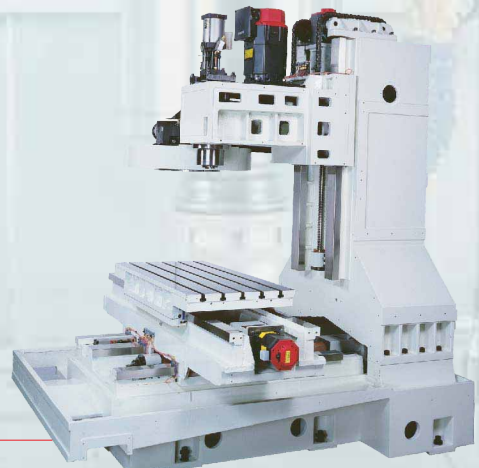


CV-2000 vertical machining center

- The linear guide ways on X/Y axes provide high rigidity, low noise and low friction characters which contribute to fast movement and excellent cutting accuracy.
- Feedrate is 20m/min in X/Y axis, 15m/min in Z axis.
- The ball bar measurement and parameter tuning are executed in every machine to ensure the dynamic accuracy.
- In Z axis, the slide way with Turcite-B is chosen for versatile cutting capabilities.

SV-1000 vertical machining center

- The X,Y and Z axes adopt the heavy-duty box way. Applying the low-friction Turcite B and the wide rail, it ensures the highest rigidity and the best machinability.
- By excellent scraping technology, best surface contact and the accuracy control, all contribute to its best contour cutting capability and less vibration characteristics.
- The ball bar measurement and parameter tuning are executed in every machine to ensure the dynamic accuracy.

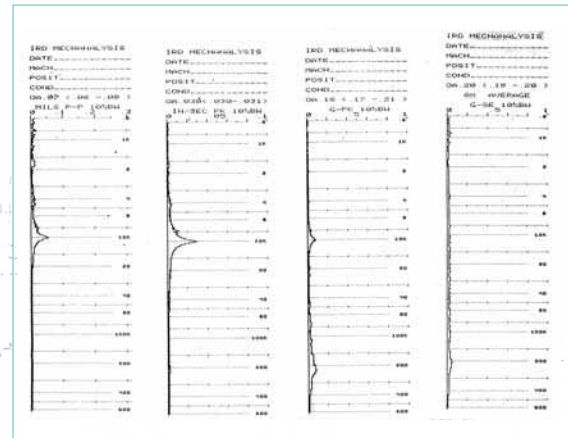


QUALITY ASSURANCE

ON-LINE SPINDLE DYNAMIC BALANCING



- The IRD dynamic balancing instrument calibrates the spindle displacement, velocity and acceleration of the full speed range.



TOOL CLAMPING FORCE TESTING



- For each machine, the tool clamping force is calibrated to ensure consistent performance.
- The high clamping force is applied for rigidity for heavy-duty cutting.

SPINDLE DYNAMIC BALANCING



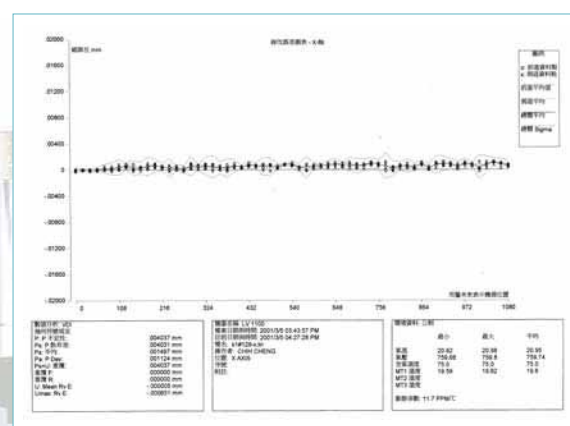
- After spindle assembly, the dynamic balancing device calibrates the spindle vibration characteristic.

ADVANCED INSPECTION INSTRUMENT AND TECHNOLOGY

Laser inspection



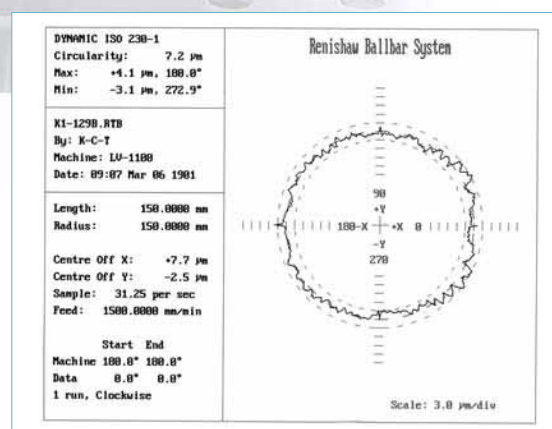
The full travel stroke is inspected and compensated by Laser measurement instrument. The motion accuracy can be ensured.



Ball bar inspection

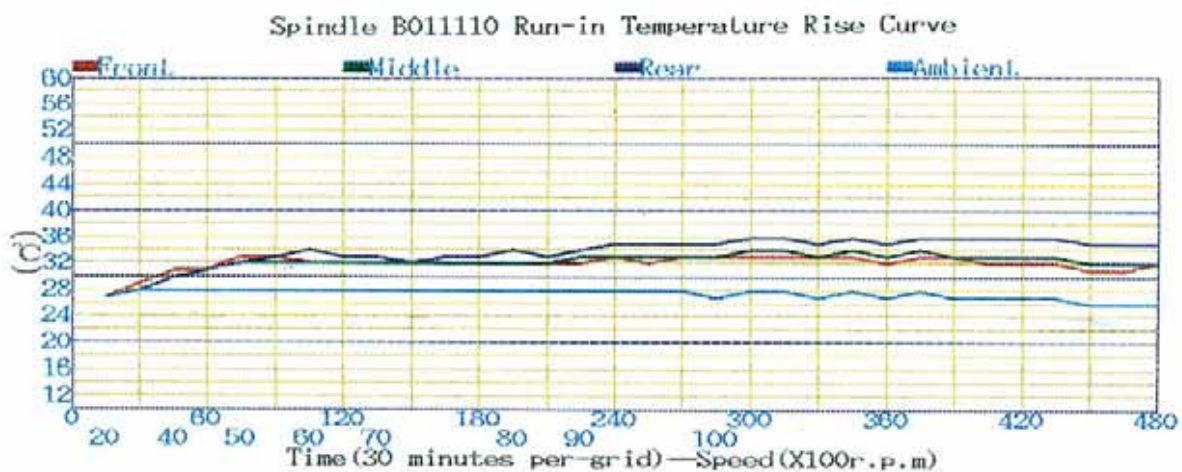


The Renishaw ball bar instrument calibrates the circularity and the geometrical accuracy to ensure precise three dimensional motions.

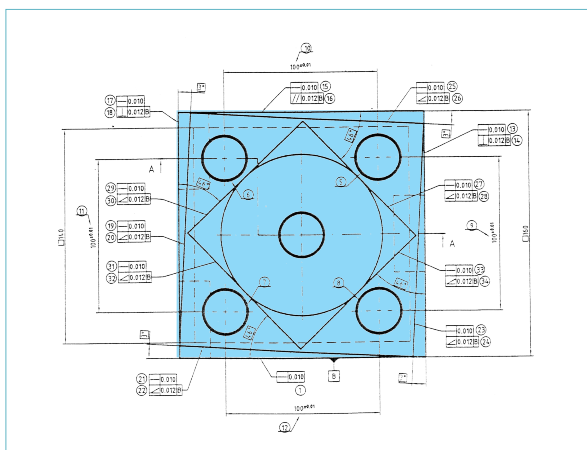


SPINDLE TEMPERATURE RISE TESTING

- After spindle assembly, every unit is tested by an automatic temperature rise testing device.
- The testing device monitors multiple points on the spindle from low speed to maximum spindle speed. The necessary test run is performed before installing it on the machine.



STANDARD SAMPLING TESTING



- Besides the in process inspection, the machine accuracy is guaranteed by a real cutting test.
- The ISO standard sampling test is an index for accuracy level.

STANDARD ACCESSORIES

HIGH EFFICIENT CHIPS REMOVAL SYSTEM

High efficient chips removal mechanism



- A simple but efficient removal mechanism can easily convey the chips to the rear side of the machine. The chips cart is convenient for chips disposal.
- The telescopic cover fully protects the rail ways and ballscrew at the rear side of Y axis.

Entire rails protection of Y axis rear



- The rails of Y axis rear is fully protected. The telescopic cover prevents chips and coolant water from going into Y axis transmission system.
- The sharp shape of telescopic cover is standard for all models.
- The telescopic cover rides on the supporting rail entirely.
- Easy maintenance for the telescopic cover of Y axis rear.



WATER GUN



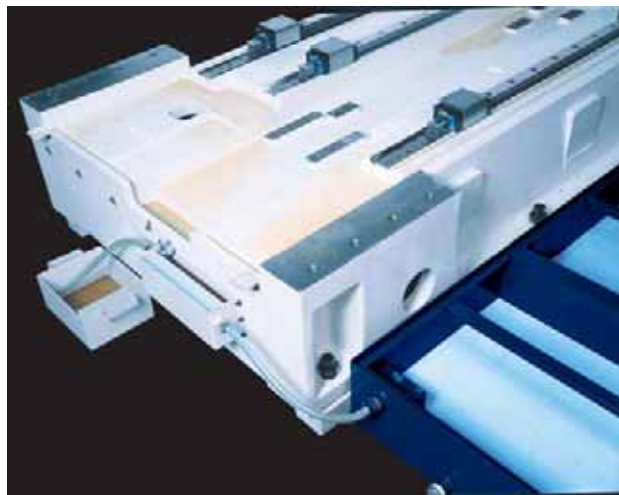
- A water gun is prepared for operator to clean the workpiece, fixture and machine.

LARGE VOLUME DESIGN IN COOLANT TANK



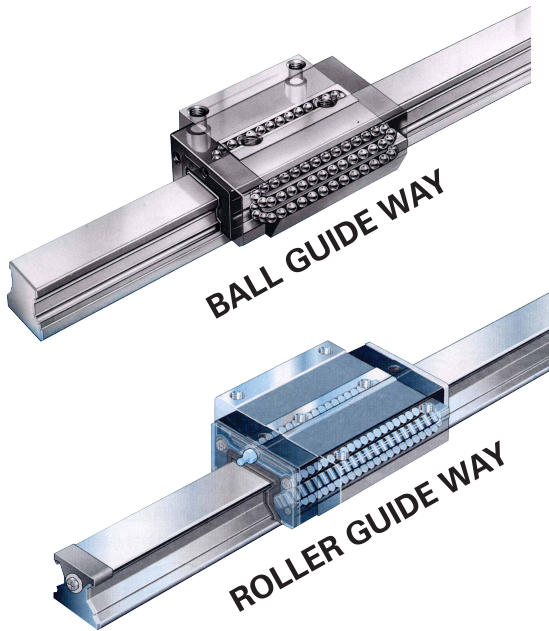
- The large coolant capacity can take away generated chip heat quickly.
- The coolant tank is located under machine to save floor space.

OIL-COOLANT SEPARATING DESIGN



- To separate oil and coolant, the unique design effectively splits the lubrication oil and the coolant. The coolant quality will last long and the machining quality will be guaranteed.

STANDARD ACCESSORIES

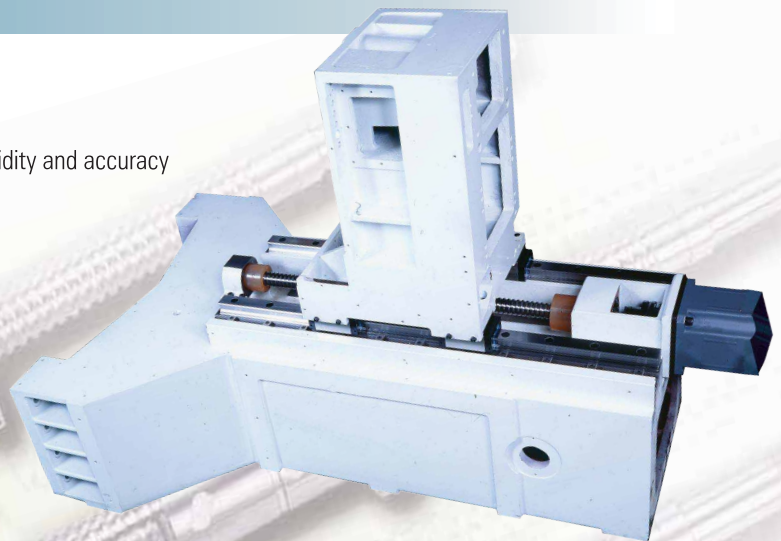


HIGH SPEED HIGH ACCURACY LINEAR GUIDE WAY

- Linear guide ways with zero backlash ensures consistent cutting surface on curve or slope cutting.
- Suitable for high speed travel and the power requirement is minimized.
- By using rolling contact in stead of sliding contact, linear guide reduces friction loss but increases positioning accuracy.
- The loading capacity is high on multiple direction. Cutting rigidity can be ensured.
- Long service life is guaranteed by its high durability.

DIRECT COUPLING AND PRETENSION DESIGN ON TRANSMISSION SYSTEM

- The servo motor is directly coupled to the ballscrew.
- The ballscrew uses a pretension design to increase rigidity and accuracy while decreasing the thermal deformation.
- The hollow ballscrew cooling system is optional for very high accuracy machining.
- The C3 grade ballscrew is adopted for accuracy guaranty.

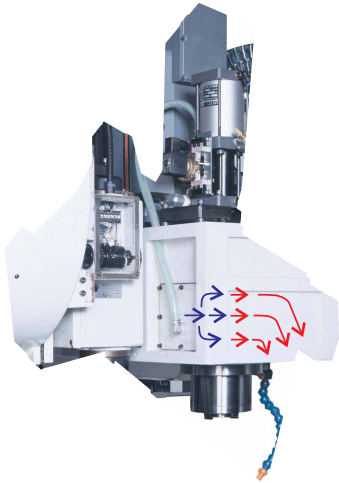


COLLISION PROTECTION DEVICE



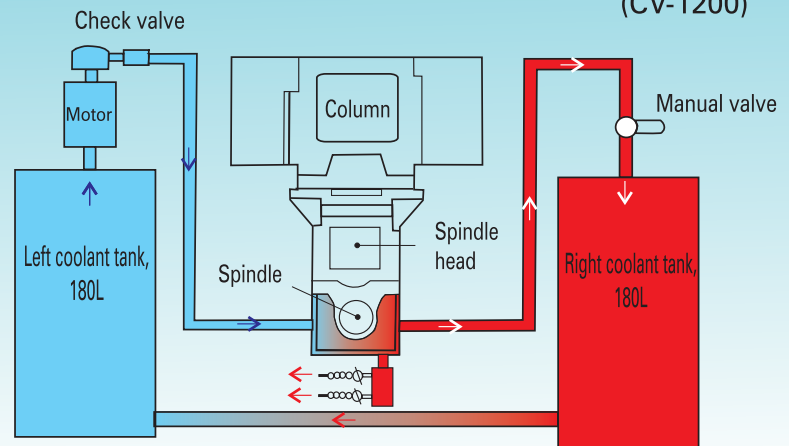
- The machine is equipped with an axis collision protection device which can absorb and reduce the collision force. The machine accuracy is still maintained if any axis malfunction happens.

UNIQUE COOLANT COOLING SYSTEM FOR SPINDLE HEAD AND SPINDLE

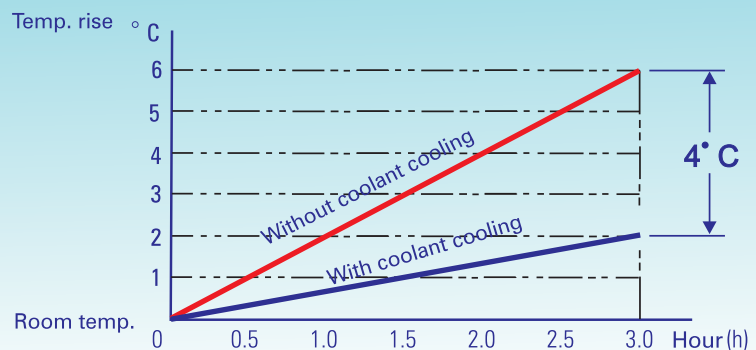


- The unique coolant cooling system takes away the heat generated at spindle head and spindle. It reduces the spindle head thermal deformation economically.
- This outstanding cooling system achieves superior cooling effect without the need of additional pump, filter or hydraulic oil.
- The cooling system assures spindle accuracy permanently and extends the service life of the spindle.
- In dry machining conditions, this innovative cooling system provides a circuit to maintain normal cooling performance.

Circulation diagram of coolant head cooling system (CV-1200)



The performance diagram of cooling system at Spindle head



HIGH PERFORMANCE ELECTRICAL CONTROL SYSTEM

- The wiring layout in the electrical cabinet meets CE safety requirements. It ensures normal operation even under surrounding disturbance
- A high performance NC controller is utilized. Its systematic and internet configuration meets advanced requirements for high speed and high accuracy.
- The heat exchanger on top of the electrical cabinet takes heat away immediately which ensures a constant temperature and stable NC operation on the electrical components.



STANDARD ACCESSORIES

HIGH SPEED AND HIGH ACCURACY SPINDLE



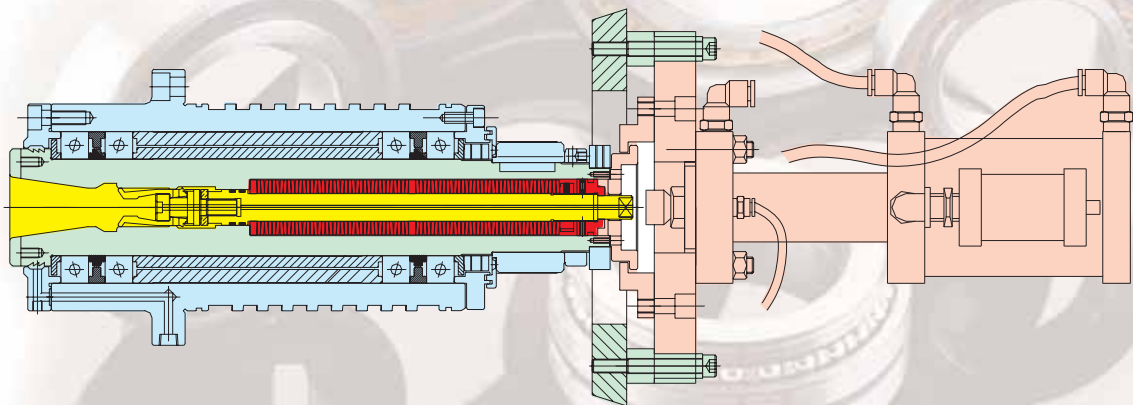
CAT/BT-40 spindle



CAT/BT-50 spindle

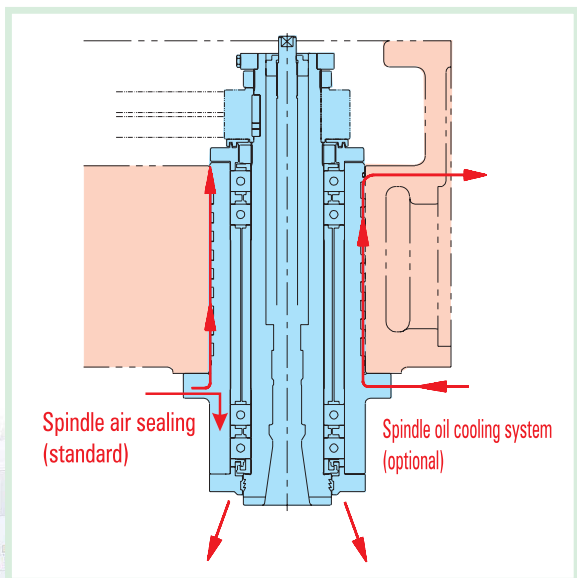
- The spindle adopts super precision angular contact ball bearings. Spindle speed 8000rpm is standard for #40, 6000rpm is standard for #50.
- The four jaws collet provides reliable tool holding force, large contact area, low wear and long service life.
- The high horse power spindle motor is selected for versatile applications. The ZF gearbox is optional for high torque output.
- The advanced high strength timing belt is applied to ensure high torque transmission, no slip and low rotation noise. Equipped with ceramic ball bearings, the spindle can work up to 12000rpm. (Optional)
- The spindle is dynamically balanced by IRD balancing equipment permitting for field balance calibration.
- This fully eliminates resonance problems on the spindle while ensuring the best possible machining accuracy.

FLOATING DRAW BAR MECHANISM

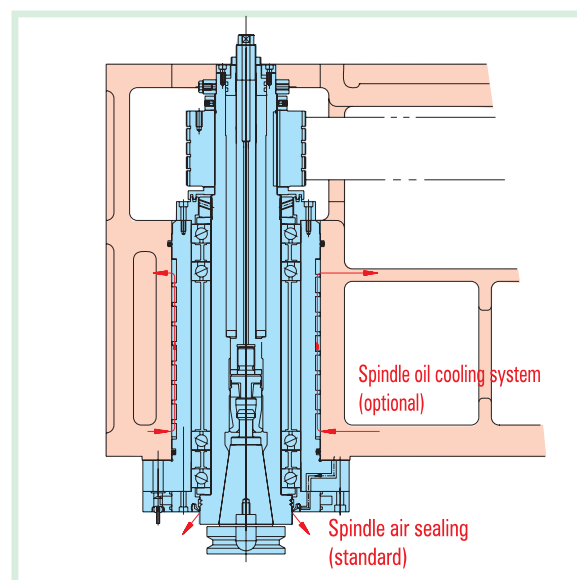


- The floating draw bar mechanism is applied. The tool unclamping force will not transmit to the spindle bearing. This extends the spindle bearing service life.

SPINDLE AIR SEALING/OIL COOLING SYSTEM



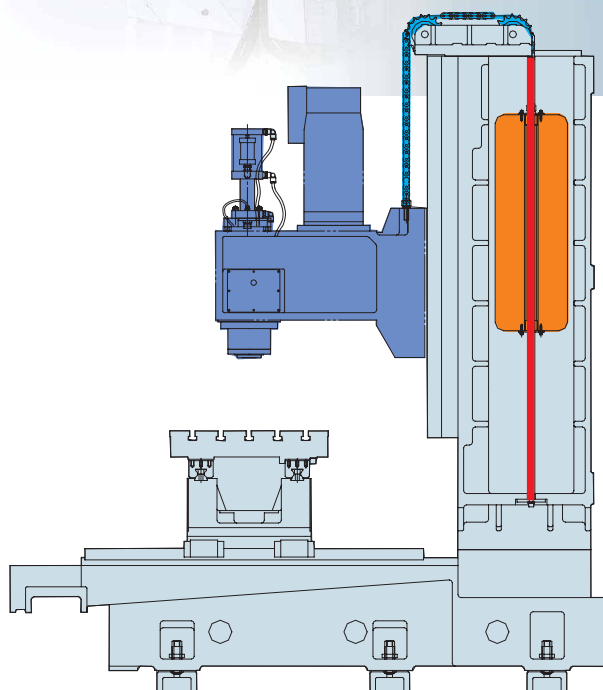
CAT/BT-40



CAT/BT-50

- While in high speed working condition, the spindle oil cooling system can efficiently keep a constant temperature on the spindle. This means less thermal deformation on the spindle head and improves the cutting accuracy.
- The spindle air sealing system prevents the vacuum pumping effect while the spindle is at very high speed. The contaminant is kept from penetrating into the spindle bearing.

CENTRAL GUIDED COUNTERWEIGHT MECHANISM



- Equipped with the central-guided counterweight mechanism, the machine can keep cutting accuracy by lessening counterweight swing while the Z axis speed is high.
- An optimal weight proportion is chosen in between spindle head and counterweight.



STANDARD ACCESSORIES

RAPID CAM TYPE ATC



- The cam type transmission mechanism provides rapid, stable and reliable tool change.
- The PLC software control provides quick tool selection to reduce non-cutting time.
- This reliability is proven by being tested over one million times.
- Tool capacity is 20 , enough for various types of application.

FRIENDLY MACHINE-OPERATOR INTERFACE



- The control panel meets the safety requirement and rotates easily for operation.
- The automatic diagnosis function displays the malfunction on screen for quick trouble shooting.
- The portable MPG is optional for easing workpiece set-up.
- The pendent arm is designed for easing control panel operation.
- The touch switch, diagram and text on screen make the operation very convenient.

PORTABLE HANDWHEEL



- The handwheel provides functions of axis, feedrate..... selection.
- The flexible long cable makes it easy for tool setting and workpiece coordination selection.

USER FRIENDLY PANEL



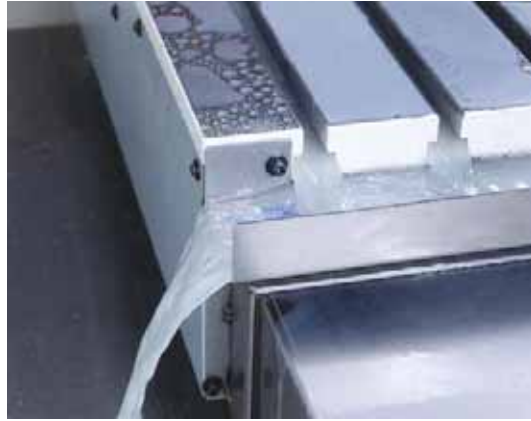
- The touch switch makes the key-in very simple.
- The icons and diagrams on screen are easy for the operator.
- The essential key is protected by a plastic cap. The reconfirmed input reduces erroneous operation.
- When in malfunction, the warning beacon will call for resetting.

CONVENIENT STORAGE



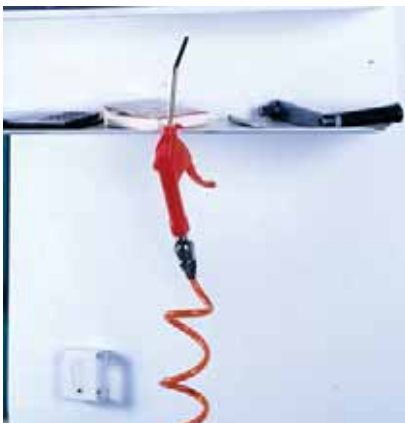
- Under the operation panel, a convenient storage area is provided for a calculator, keys, pens, etc...
- The hook in front of the operation panel is also useful for an air-gun, handling tool, etc.....

COOLANT FLOW GUIDE-WAY



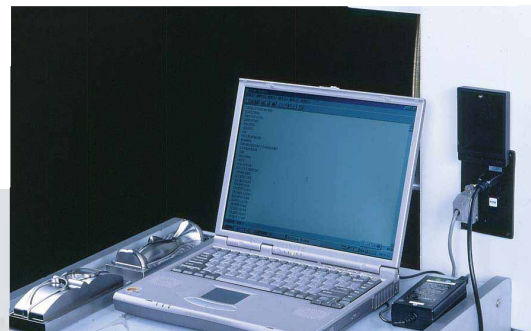
- At both sides of the table, the coolant flow guide-way is designed for mass coolant flow. This provides reduced coolant splashing.
- The coolant flow guide-way efficiently introduces the coolant flow. The service life of the telescopic cover is prolonged due to less coolant and chips on it.

AIR GUN



- In front of the machine, an air pressure interface is ready for an air gun.
- Operator can use the air gun for workpiece, fixture cleanliness.

RS-232 TRANSMISSION



- On the RS-232 transmission box, a standard connector interface is ready for PC connection.
- Both 110 and 220 voltages are available for easy use.
- An overload fuse is applied for PC protection.

STANDARD ACCESSORIES

WORK LIGHT



- The work light is well located for operator's set-up and measurement.
- The work light is anti-dust, water-proof and anti-explosion.
- The lamp is a common commercial product. It is a great benefit for instant maintenance.

WARNING LIGHT



- When the machining process is completed, the yellow light calls the operator to unload /load the workpiece.
- When there is a malfunction or an alarm message in operation, the red light calls the operator for instant trouble shooting.

CABINET HEAT EXCHANGER



- The heat exchanger is located on the top of the electrical cabinet. The heat exchanger takes in fresh air from outside cabinet but conveys the cabinet heat into the air.

M30 AUTOMATIC POWER OFF



- M30 function is especially useful for the long processing workpiece. M30 is put at the last statement of the NC program; when the NC program is completed, the machine can be powered off automatically. There is no need for operator to wait and switch off the power.
- This function can be actuated by the setting of the main switch.

OPTIONAL ACCESSORIES

STABLE AND RELIABLE ATC



Arm type 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 ATC reliability has been proven by over one million running tests.
- The fast ATC saves non-cutting time.
- The cam driven tool magazine ensures rotation accuracy, and smooth motion while full tools loading.



Magazine capacity: 24 tools



Magazine capacity: 32 tools

TOOL CABINET



- The tool cabinet behind the machine provides an excellent tool storage area.
- The cabinet tool-box is convenient for utilities maintenance.

DOCUMENT CLIP AND APPLIANCE BOX



- Beside the operation panel, the document clip provides an ideal place to put workpiece processing sheets or any important notices.
- The appliance box, behind the document clip, is convenient for the operator to keep tape, an IC card and appliances.

OPTIONAL ACCESSORIES

ZF GEAR BOX AND OIL COOLER SYSTEM



- Combining the high horse power motor and German ZF gear box to get high torque output at low spindle speed. It is especially suitable for heavy duty cutting.
- ZF gear box provides stability and low noise at high speed rotation.
- The oil cooling system takes away the generated heat from high speed rotation and ensures a long service life for the gear box.

SPINDLE OIL COOLING SYSTEM



- The spindle oil cooling device is located on the machine which is beneficial because it reduces floor space.
- For continuous and very high spindle speed, the spindle cooling system efficiently takes away spindle heat, reduces spindle thermal deformation and ensures high speed accuracy.

SPINDLE AIR BLOW SYSTEM



- During dry cutting conditions, the programmable spindle air blow system blows away the chips to increase the surface shine of the workpiece.
- The system can be easily controlled by NC code.

PROGRAMMABLE COOLING NOZZLE



- The programmable cooling nozzle can be easily controlled and adjusted by NC M-code. The nozzle position automatically corresponds to each tool.
- Due to its step-less orientation capability, the programmable cooling nozzle directly points to the tool end.

OIL HOLE HOLDER STOPPER AND TOOL SYSTEM



- The oil hole holder stopper and tool system are especially suited to deep drilling operations. Various tool systems are available for the users choice.

SPINDLE SPLASH RING



- Eight splash nozzles on the ring surround the spindle. The splash coolant takes away heat from tool and workpiece to increase the cutting accuracy.

WASH DOWN SYSTEM



- Due to its high efficiency and coolant pressure, the wash down system can easily take the chips to the chip auger which screws the chips onto the chip cart. This will help to create perfect working and machine conditions.

OPTIONAL ACCESSORIES

WORKPIECE MEASUREMENT

- The Renishaw MP10 probe is used for workpiece set-up and inspection.
- Repeatability: 1.0um is certified at 480mm/min.
- Probe switch-on is selectable between M code and auto start.
- Sealed to 1P68 standard.
- A stylus weak link is included in each kit, to protect the probe in the event of excessive over travel.



AUTOMATIC VOLTAGE STABILIZER



- Input voltage available: 110V/220V/380V, frequency 50Hz/60 Hz.
- The output voltage is stable within $\pm 1\%$.
The overload protection is as standard.
- The low/high voltage and overshoot protection is as standard.
- The system has the capability of power-off delay while sudden power trip.
- The 30% phase deviation can be smoothed within 2%.

TOOL LENGTH MEASUREMENT



- The tool length measurement system can measure and offset the tool length data onto the CNC controller automatically.
- Through the macro program, the measurement is executed automatically.

OIL DEMISTER



- The full enclosure and oil demister can collect the particle and oil mist during machining. The operator is free from harmful tinning particles and health risks.
- Even the machine is located in the enclosed space, the clean air is kept and green technology is satisfied.

HIGH PRECISION LINEAR SCALE



- The X/Y/Z axis can be equipped with linear scale. This measures and compensates thermal effects of the machine, resulting in high accuracy control. It is applied in extra high accuracy machining.
- The linear scale utilizes air sealing which prevents particle and oil mist contamination. The service life of the scale can be guaranteed.

THE 4TH AXIS (ROTARY TABLE)



- Equipped with the 4th axis table, the machine can execute the multi dimensional cutting to reduce loading / unloading time of the workpiece.
- The indexing capability is especially suitable for screw cutting or any kind of complicated machining.

THE 4/5 AXES



- By applying the professional 4/5 axes rotary table and 5 axes controller system, the complicated workpiece can be finished by one set-up.

OPTIONAL ACCESSORIES

THE HEAT EXCHANGER ON ELECTRICAL CABINET



- The system protects the controller, motor driver and electrical components by temperature control. It is free from shut down or electrical trip after long operation times.

INFRARED TOOL BROKEN DETECTION DEVICE



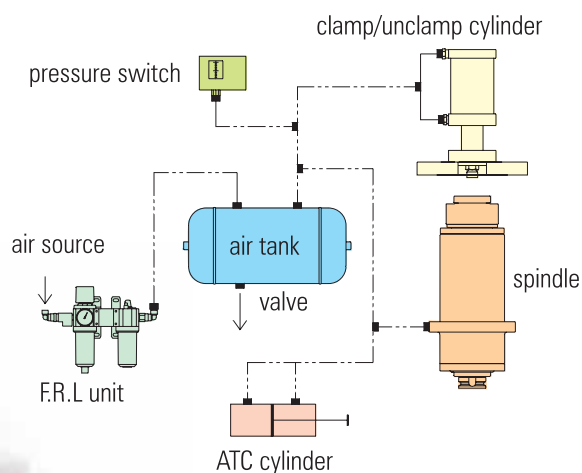
- The detection device can inspect the tool's tiny brake before machining. When tool brake is detected, the device transmits a signature to NC controller to stop the operation.
- The detection device initiates the beacon's horn to notify the operator.

DISC OIL/COOLANT SEPARATOR



- The unit is easily installed and is an optimal space saver.
- The unit efficiently separates the oil from the coolant tank. The coolant quality, life and workpiece accuracy will be increased.

AIR TANK SYSTEM



- The system is utilized when there is only one source of air pressure for many machines. The system stabilizes air pressure to the pneumatic units. Condensed water is controlled through a drain release valve.

TRANSFORMER



- The voltage 380, 415 is available for user's local regulation.
- The transformer is located on the machine. It saves floor space. The wiring and protection meets CE standard.

SAFETY DOOR INTERLOCK



- Without the door closed, the programmed operation will not begin. This ensures the operator's safety.
- Opening the door during machining will cause an emergency stop.

COOLANT THROUGH SPINDLE AND FILTER SYSTEM



- Equipped with the coolant through spindle system, the coolant goes through the spindle and splashes out through the tool tips.
- The high pressure coolant will take away heat and chips immediately. It is a great advantage for high quality part machining and deep hole drilling.

FANUC SERIES



FANUC Series 0i-M MODEL B

AI contour control

- High speed, high precision machining is possible without adding new hardware
- Excellent for machining complex workpieces, and mold dies
- FANUC Know-how in high speed and high precision machining is used extensively
 - Reduced path error
 - Look ahead acc./dec. before interpolation across multiple blocks
 - Preview feed forward
 - Higher feedrate
 - 40 blocks look ahead
 - Multiple block overlap
 - Automatic corner deceleration
 - Feedrate clamp by acc./dec.
 - Feedrate clamp by arc radius

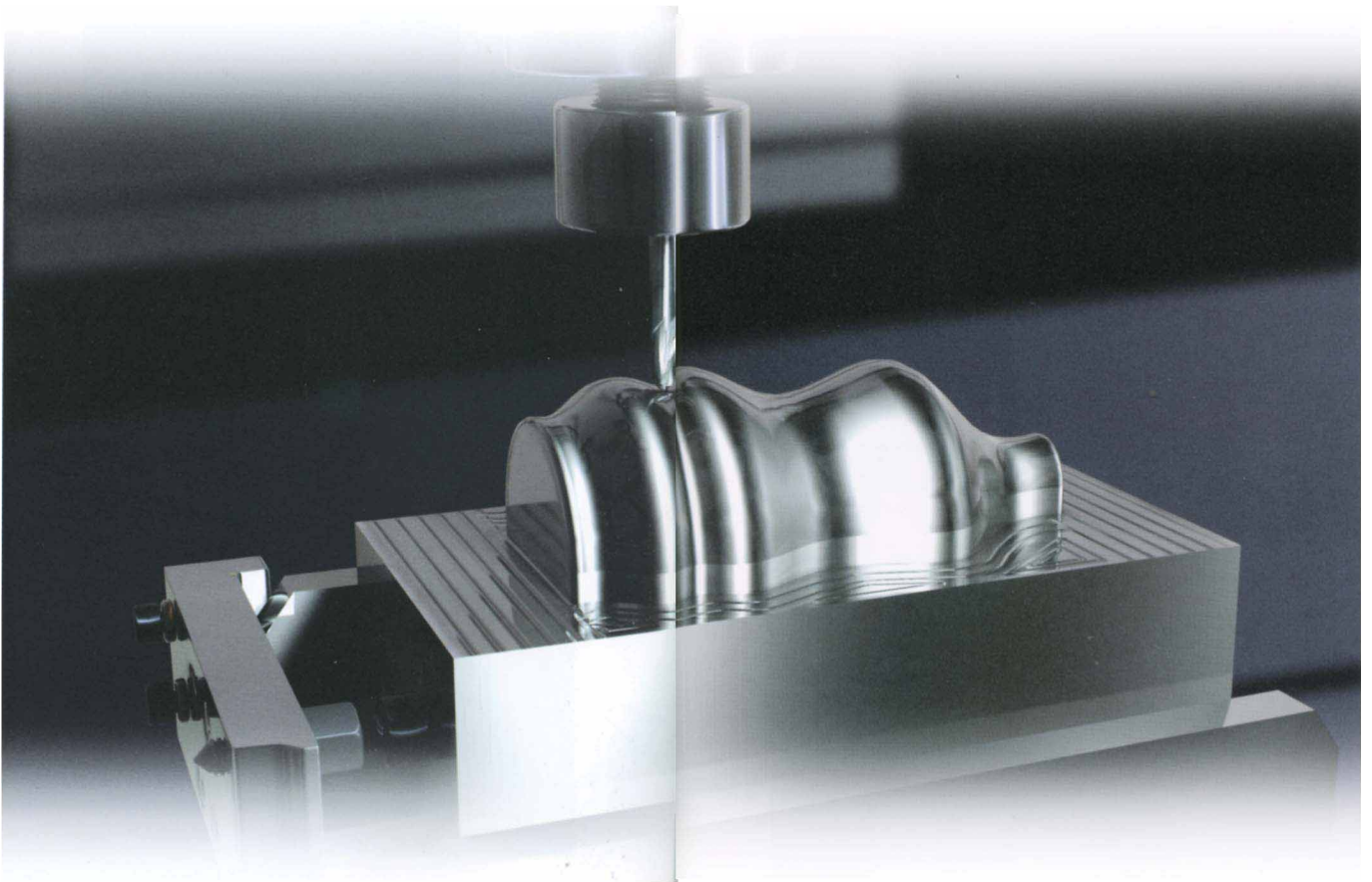
FANUC Series 0i MODEL B

- FANUC Series 0i MODEL B is the highly reliable and cost-performance CNCs up to 4 axes
- Simple operation programming support tool MANUAL GUIDE 0i
- Capacity/Number of programs 640m
- AI advanced preview control 20 blocks
- Linear, Circular, Helical, Cylindrical, Polar coordinate interpolation function
- Graphic assistance screen is available
- Variety of display units
 - 7.2" LCD / 9" CRT (monochrome)
 - 8.4" / 10.4" LCD (color)

FANUC Series 18i MODEL B

- FANUC Series 18i MODEL B is Ultra-compact, Ultra-thin CNC with network interface. The Maximum controlled 8 axes, the simultaneously controlled 4 axes
- Part program storage length 2560m
- Ethernet interface is provided as standards. FANUC LADDER-III and Servo Tuning Tool can be connected
- Tool supporting remote diagnosis of machine by Machine Tool builders. Checking CNC/PMC status by remote operation for trouble-shooting of machine. It can reduce time to recover and allows MTB efficient service activities
- FANUC Series 18i MODEL B is providing AI Nano high precision contour control and Nano contour control function. Also providing dual check safety function and tool management function

New Architecture to Meet the Need for Higher Speed



Newest RISC-CPU Provides the Most Advanced Full-Fledged Nano-Control Capability

- The state-of-the-art RISC-CPU and the high-speed optical servo network enable high-speed, high-precision control, nano-control, and 5-axis control.
- Extension unit allow for the easy addition of functions.
- The ultra-high-speed PLC engine substantially reduces cycle time.

High-speed Optical Servo Network

- Full-fledged nano control performs everything from NC computation to servo control processing in nano-units, ensuring high-quality machining results.
- The combination of cutting-edge technologies such as full-fledged nano-control, SSS (Super Smooth Surface) control, and OMR (Optimum Machine Response) control leads to extremely high-quality, precision results.
- Full-fledged nano-control enables high-speed, high-precision cutting at a maximum 135kBPM (BPM: Blocks Per Minute) in fine segment feeding.

High-Speed Motor for Versatile Adaptability to Various Machines

- HF/HP series servo motors offer high speed and powerful torque, contributing to improved productivity.
- High-resolution encoder (16,000,000P/rev) supports high-precision processing.
- Linear servo motors and direct-drive servo motors are available for high-speed, high-precision machining operations.

Communication Terminals Offering Easy Use and High Performance

- Improved graphic performance offers better visibility and easier operability.
- The 10/100-Mpps Ethernet connection ensures high-speed communication and also enables easy system upgrading.
- IC Card and Compact Flash are supported. High-speed program server operation is possible.

HIGH SPEED AND HIGH PERFORMANCE CUTTING



■ PROCESS : MOBILE PHONE MOLD

■ MATERIAL: NAK-80

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min.)
Ø12 end-mill	6000	225	2000	0.5	14
R2 ball-mill	10000	125	4000	0.2	32
R3 ball-mill	10000	188	2000	0.3	35
R3 ball-mill	10000	188	4000	0.2	10
R1.5 ball-mill	10000	94	3000	0.1	11
R1 ball-mill	10000	62	1000	0.1	20
R1 ball-mill	10000	62	2000	0.05	240



■ PROCESS: HANDLE MOLD

■ MATERIAL: NAK-80

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
Ø20 end mill	2000	125	650	1	61
Ø12 end mill	2300	87	400	0.5	13
R6 ball mill	2600	98	500	0.5	40
R4 ball mill	5600	140	1400	0.5	160



■ PROCESS: BOTTLE MOLD

■ MATERIAL: NAK-80

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
R5 ball mill	7000	220	1000	0.5	42
R5 ball mill	8000	251	1000	0.3	23
R4 ball mill	8000	201	1000	0.1	47

HIGH SPEED AND HIGH PERFORMANCE CUTTING



■ PROCESS: GLASSES MOLD

■ MATERIAL: T6 ALUMINUM ALLOY

■ Cutting conditions

tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
Ø20 end-mill	3000	188	1400	1	30
Ø12 end-mill	5300	199	1600	1	6
R6 ball-mill	5300	199	2100	0.6	4
R4 ball-mill	7800	195	1400	0.6	6
R3 ball-mill	9000	169	1400	0.6	6
R2 ball-mill	9000	113	1400	0.5	292



■ PROCESS: PYRAMID

■ MATERIAL: T6 ALUMINUM ALLOY

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
Ø12 end mill	5000	188	2400	1	20
R4 ball mill	7500	188	1400	0.5	185



■ PROCESS: LIGHT MOLD

■ MATERIAL: NAK-80

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
Ø10 end mill	1900	60	290	0.5	73
Ø10 end mill	1900	60	290	0.2	3
Ø10 end mill	1900	60	290	0.2	7
R4 ball mill	4200	106	470	0.5	17
R2 ball mill	8000	50	1600	0.1	100

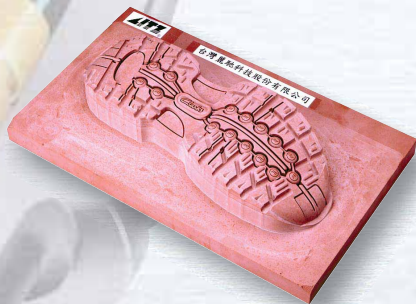


■ PROCESS: MOUSE

■ MATERIAL: T6 ALUMINUM ALLOY

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (分)
R4 ball mill	8000	100	2000	0.8	33
R4 ball mill	8000	100	3000	0.3	7
R3 ball mill	8000	75	3000	0.2	3
R3 ball mill	8000	75	3000	0.1	2.6
R3 ball mill	8000	75	3000	0.2	4
R4 ball mill	8000	100	1500	0.1	27
R4 ball mill	8000	100	1500	0.1	26



■ PROCESS: SPORT SHOES

■ MATERIAL: ARTIFICIAL WOOD

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
Ø25 end mill	6000	471	1200	25	7
R6 ball mill	6000	226	5000	10	9
R1.5 ball mill	8000	75	3600	5	30
R0.75 ball mill	8000	38	3600	0.5	335
Ø1.5 flat mill	8000	38	1200	3	8
Ø1.5 flat mill	8000	38	1200	3	5
Ø0.5 flat mill	8000	13	500	1	10
Ø0.3 flat mill	8000	7.5	300	1	8



■ PROCESS: CAMERA MOLD

■ MATERIAL: NAK-80

■ Cutting conditions

Tool	spindle speed (RPM)	cutting speed (m/min)	feedrate (mm/min)	cutting depth (mm)	time (min)
Ø12 end mill	825	31	137	2	150
R4 ball mill	3750	94	450	2	40
R3 ball mill	10000	188	2000	0.1	108

MACHINE SPECIFICATION

		CV-600	CV-800	CV-1000	CV-1200A
Travel					
X travel	mm(inch)	610 (24.0)	800 (31.5)	1020 (40.2)	1200 (47.2)
Y travel	mm(inch)	410 (16.1)	500 (19.7)	560 (22.0)	600 (23.6)
Z travel	mm(inch)	540 (21.3)	540 (21.3)	600 (23.6)	675 (26.6)
Spindle nose to table	mm(inch)	100-640 (3.9-25.2)	150-690 (5.9-27.2)	135-735 (5.3-28.9)	100-775 (3.9-30.5)
Spindle					
Spindle speed	rpm	10000	8000	8000	8000
Automatic tool changer (ATC)					
Tool number	No.	16	16	20	20
Maximum tool diameter	mm(inch)	80(3.1)	100 (3.9)	100 (3.9)	100 (3.9)
Maximum tool length	mm(inch)	200(7.9)	260 (10.2)	305 (12.0)	305 (12.0)
Maximum tool weight	kg(lb)	7 (15.4)	7 (15.4)	7 (15.4)	7 (15.4)
ATC type		Drum type	Drum type	Drum type	Drum type
Tool shank		#40	#40	#40	#40
Motors					
Main spindle motor	kw (HP)	5.5/7.5(7.5/10)	7.5/11(10/15)	7.5/11(10/15)	11/15(15/20)
X/Y/Z motor	kw (HP)	1/1.5/2(1.3/2.0/2.7)	1.5/1.5/2 (2.0/2.0/2.7)	2/2/2 (2.7/2.7/2.7)	2/2/2 (2.7/2.7/2.7)
Table					
Table size	mm(inch)	700x400(27.6x15.7)	910x500 (35.8x19.7)	1000x560(39.3x22)	1220x620 (48.0x24.4)
Maximum table capacity	kg(lb)	350 (770)	500 (1100)	750 (1650)	1000(2200)
T slot (No. x Width x Center)	mm(inch)	5x14x63(5x0.55x2.5)	5x18x100(5x0.7x3.9)	5x18x100(5x0.7x3.9)	5x18x100 (5x0.7x3.9)
Rapid speed					
X rapid speed	M/min (fpm)	36(118)	24 (78.7)	24 (78.7)	24 (78.7)
Y rapid speed	M/min (fpm)	36(118)	24 (78.7)	24 (78.7)	24 (78.7)
Z rapid speed (box way)	M/min (fpm)	24/linear (78.7)	20/linear (65.6)	18 (59.1)	18 (59.1)
Cutting feedrate	mm/min (ipm)	1-10000 (0.04-394)	1-10000 (0.04-394)	1-10000 (0.04-394)	1-10000 (0.04-394)
Controller					
Mitsubishi		M64S	M64S	M64S	M64S
Miscellaneous					
Machine weight	kg(lb)	4200(9300)	5300 (11700)	7000 (15400)	8000(17600)
Power requirement	KVA	15	20	25	35
Coolant tank capacity	L	200	290	290	360
Air source	kg/cm ² (psi)	6 (85)	6 (85)	6 (85)	6 (85)

STANDARD ACCESSORIES

- Chips auger
- Full enclosure (under CV-1200)
- Semi enclosure (above CV-1400)
- Automatic lubrication system
- Spindle coolant cooling
- Base bolt and pad
- Tools box
- Work light
- Alarm light
- M30 automatic power off
- Portable air gun
- Spindle air seal system
- Portable water gun
- Mechanical, electrical, operation manuals
- Rigid tapping
- Cabinet heat exchanger
- Mechanical oil-coolant separator
- Automatic tool changer
- Telescopic covers
- Floating draw bar mechanism
- Convenient storage
- RS-232 transmission
- Portable handwheel
- Center guided counterweight mechanism
- Chips cart
- Air tank system

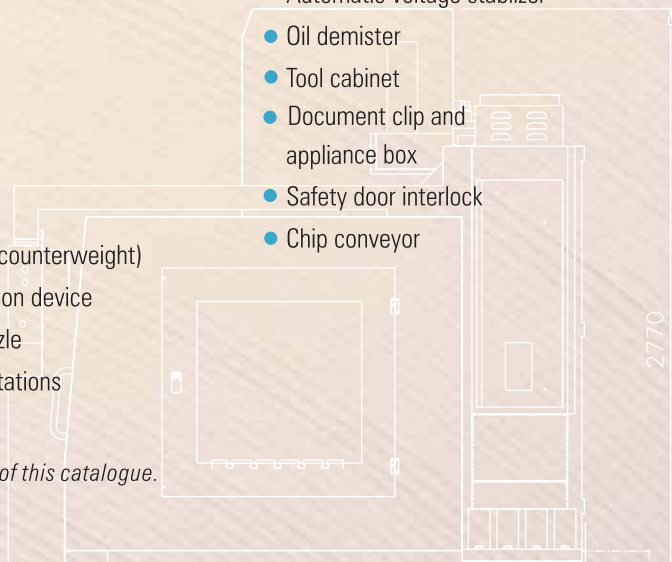
■ This catalogue is only for reference. The machine may differ to this specification.

CV-1200B	CV-1400	CV-1600	CV-2000	MV-1000	MV-1400	SV-1000
1200 (47.2)	1400(55.1)	1600(63.0)	2000(78.7)	1020(40.2)	1400(55.1)	1020(40.2)
600 (23.6)	900(35.4)	900(35.4)	900(35.4)	510(20.1)	650(25.6)	600(23.6)
675 (26.6)	800(31.5)	800(31.5)	800(31.5)	540(21.3)	675(26.6)	635(25)
100-775 (3.9-30.5)	100-900(3.9-35.4)	100-900(3.9-35.4)	100-900(3.9-35.4)	100-640(3.9-25.2)	100-775(3.9-30.5)	100-735(3.9-28.9)
6000	6000	6000	6000	8000	8000	8000
24	24	24	24	16	20	20
240 (9.4)	240 (9.4)	240 (9.4)	240 (9.4)	100(3.9)	100(3.9)	100(3.9)
305 (12.0)	305 (12.0)	305 (12.0)	305 (12.0)	305(12.0)	305(12.0)	305(12.0)
15 (33.1)	15 (33.1)	15 (33.1)	15 (33.1)	7(15.4)	7(15.4)	7(15.4)
Arm type	Arm type	Arm type	Arm type	Drum type	Drum type	Drum type
#50	#50	#50	#50	#40	#40	#40
11/15(15/20)	15/18.5(20/25)	15/18.5(20/25)	15/18.5(20/25)	7.5/11(10/15)	11/15(15/20)	7.5/11(10/15)
2/2/2 (2.7/2.7/2.7)	3.5/3.5/3.5 (4.7/4.7/4.7)	3.5/3.5/3.5 (4.7/4.7/4.7)	4.5/4.5/4.5 (6/6/6)	1.5/1.5/1.5(2./2./2.)	2/2/2(2.7/2.7/2.7)	2/2/2(2.7/2.7/2.7)
1220x620 (48.0x24.4)	1500x850(59.1x33.5)	1700x850(66.9x33.5)	2100x850(82.7x33.5)	1000x500(39.4x19.7)	1400x620	1200x560
1000(2200)	2000 (4410)	2000 (4410)	3000(6610)	500(1100)	1000(2200)	1000(2200)
5x18x100 (5x0.7x3.9)	7x18x100(7x0.7x3.9)	7x18x100(7x0.7x3.9)	7x18x100(7x0.7x3.9)	5x18x100(5x0.7x3.9)	5x18x100(5x0.7x3.9)	5x18x100(5x0.7x3.9)
24 (78.7)	20(65.6)	20(65.6)	20(65.6)	24(78.7)	24(78.7)	18(59.1) (BOX)
24 (78.7)	20(65.6)	20(65.6)	20(65.6)	24(78.7)	24(78.7)	18(59.1) (BOX)
18 (59.1)	15(49.2)	15(49.2)	15(49.2)	20/linear (65.6)	20/linear (65.6)	18(59.1)
1-10000 (0.04-394)	1-8000 (0.04-315)	1-8000 (0.04-315)	1-8000 (0.04-315)	1-10000(0.04-394)	1-10000(0.04-394)	1-8000 (0.04-315)
M64S	M64S	M64S	M64S	M64S	M64S	M64S
9000(19800)	18000 (35300)	19000 (41900)	21000 (46300)	5800(12760)	9000(19800)	7000(15400)
35	40	40	40	20	35	25
360	500	500	550	240	360	290
6 (85)	6 (85)	6 (85)	6 (85)	6 (85)	6 (85)	6 (85)

OPTIONAL ACCESSORIES

- Spindle programmable air blow
- Fanuc/Mitsubishi/Siemens controller
- Wash-down system
- 4th axis rotary table
- 10000rpm/12000rpm/14000rpm spindle
- Linear scale
- Spindle oil cooling system
- Tool probe system
- Touch sensor system
- Deep drill tools holder
- Disc oil-coolant separator
- Coolant through spindle
- Coolant through ballscrew
- ZF gear box
- X/Y/Z roller guide
- Spindle splash ring
- Z axis with brake (without counterweight)
- Infrared tool broken detection device
- Programmable coolant nozzle
- Arm type ATC 24/32 tool stations
- 380V/50Hz transformer
- Automatic voltage stablizer
- Oil demister
- Tool cabinet
- Document clip and appliance box
- Safety door interlock
- Chip conveyor

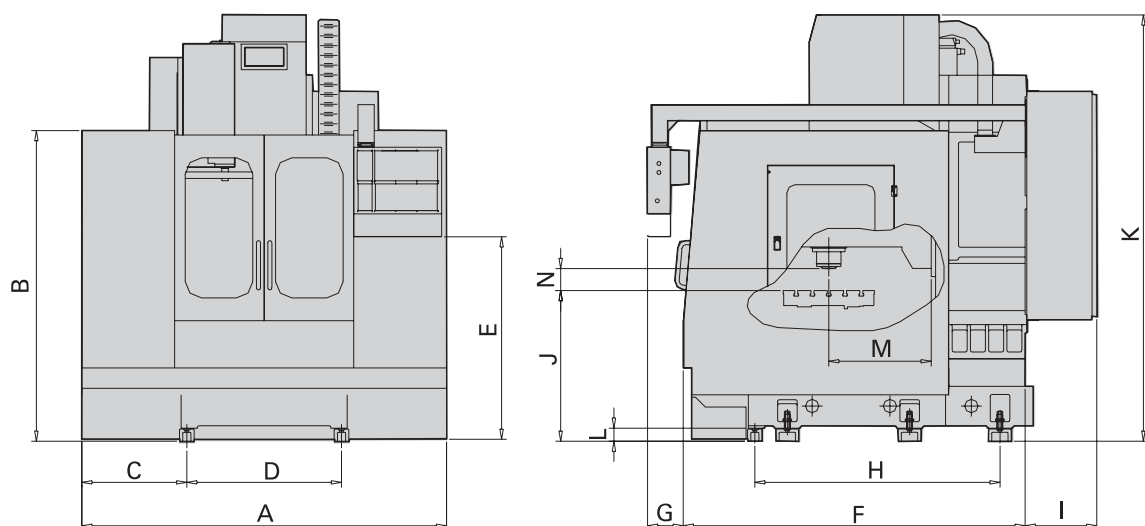
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Machine D

Machine Dimensions

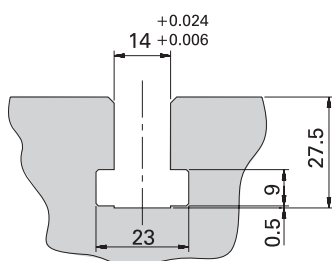
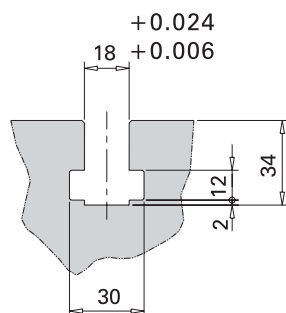
Front View	CV-600	CV-800	CV-1000	CV-1200
A	1850	2100	2240	2880
B	1814	1850	1907	1900
C	680	705	775	930
D	490	690	950	1120
E	1150	1118	1175	1230
Side View	CV-600	CV-800	CV-1000	CV-1200
F	1580	1936	2110	2180
G	202	229	219	235
H	800	1226	1506	1685
I	430	430	430	300
J	915	910	925	881
K	2454	2557	2617	2800
L	26	80	80	80
M	440	575	630	635
N	85	150	135	100
Table	CV-600	CV-800	CV-1000	CV-1200
X	700	910	1000	1220
Y	400	500	560	620
Z	74	50	80	110
W	63	100	100	100
T Slot	CV-600	CV-800	CV-1000	CV-1200
No. of T Slot	5	5	5	5



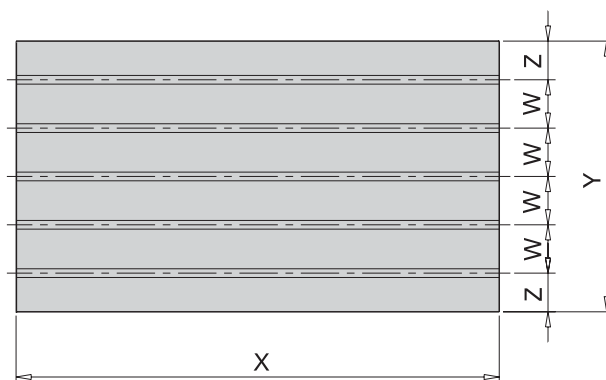
Dimensions

Unit:mm

CV-1400	CV-1600	CV-2000	MV-1000	MV-1400	SV-1000
3840	3840	4400	2240	3270	2870
2375	2375	2375	1850	1900	1937
1290	1290	1570	775	1125	1035
1360	1360	1360	690	1120	800
950-1150	950-1150	950-1150	1118	1230	1070
CV-1400	CV-1600	CV-2000	MV-1000	MV-1400	SV-1000
3205	3205	3205	1936	2180	2110
700	700	700	229	235	249
2538	2538	2538	1226	1685	1545
430	430	430	430	0	40
1087	1087	1087	960	896	950
3245	3245	3245	2527	2800	2856
100	100	100	80	80	80
970	970	970	575	660	639
100	100	100	100	100	100
CV-1400	CV-1600	CV-2000	MV-1000	MV-1400	SV-1000
1500	1700	2100	1000	1400	1200
850	850	850	500	620	560
125	125	125	50	110	80
100	100	100	100	100	100
CV-1400	CV-1600	CV-2000	MV-1000	MV-1400	SV-1000
7	7	7	5	5	5



(CV-600)





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