



VERTICAL MACHINING CENTER

Box Ways Series

KEEPING OUR CUSTOMERS IN THE LEAD

Top-One Machinery Co., Ltd. is an internationally recognized manufacturer of vertical machining centers and double column machining centers. Based on our outstanding R & D capabilities, company structure and experience, we are capable of both the design and manufacture of machining centers that feature greater machining capacity, higher accuracy and minimum trouble. Our objective is to offer the best possible machining centers to help customers stay competitive.

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TOP-ONE MACHINERY CO., LTD

MCV-855

HEAVY CUTTING CAPACITY IN AN ECONOMICAL PACKAGE

- X, Y, Z-axis travel 800 x 500 x 550 mm.
- BT40 spindle taper
- 8000 rpm belt drive spindle
- 2 box ways on base
- Choice of arm type or armless type automatic tool changer
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment



MCV-1370

PERFECTLY SUITED FOR HEAVY AND PRECISION CUTTING

- X, Y, Z-axis travel 1300 x 700 x 650 mm
- BT50 spindle taper
- 6000 rpm belt drive spindle
- 4 box ways on base
- Arm type automatic tool changer
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment



MCV-1100

HIGH QUALITY AND FEATURE INTEGRATED

- X, Y, Z-axis travel 1100 x 660 x 560 mm
- BT40 spindle taper
- Choice of 8000 rpm belt drive spindle or 6000 rpm gear drive spindle
- 2 box ways on base
- Arm type automatic tool changer
- The spindle head employs SCBS automatic balancing system to improve counter-balance weight and hydraulic system.
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment

MCV-1580

RUGGEDLY BUILT!
HEAVY CUTTING CAPACITY!
INCREASED EFFICIENCY!

- X, Y, Z-axis travel 1500 x 800 x 700 mm
- BT50 spindle taper
- 6000 rpm belt drive spindle
- 4 box ways on base
- Arm type automatic tool changer
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment



MCV-1690 / MCV-1890

POWER, DURABILITY AND CAPACITY MAKE HEAVY CUTTING EASIER.

MCV-1690

- X-axis travel: 1600 mm
- Y-axis travel: 900 mm
- Z-axis travel: 680 mm (belt drive)
- Z-axis travel: 650 mm (gear drive)
- BT50 spindle taper
- Choice of 6000 rpm belt drive spindle or 4500 rpm gear drive spindle
- 4 box ways on base
- Semi-enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment

MCV-1890

- X-axis travel: 1800 mm
- Y-axis travel: 900 mm
- Z-axis travel: 680 mm (belt drive)
- Z-axis travel: 650 mm (gear drive)
- BT50 spindle taper
- Choice of 6000 rpm belt drive spindle or 4500 rpm gear drive spindle
- 4 box ways on base
- Semi-enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment



Full enclosed splash guard (option)

Every Top-One machining center is manufactured with the tradition of Top-One's quality excellence.

RUGGED CONSTRUCTION FOR HEAVY CUTTING

High Quality Structural Material

All major structural parts are manufactured from high quality Meehanite cast iron, stress relieved for maximum stability, and a lifetime free of deformation.

GREATER SPAN BETWEEN SLIDEWAYS

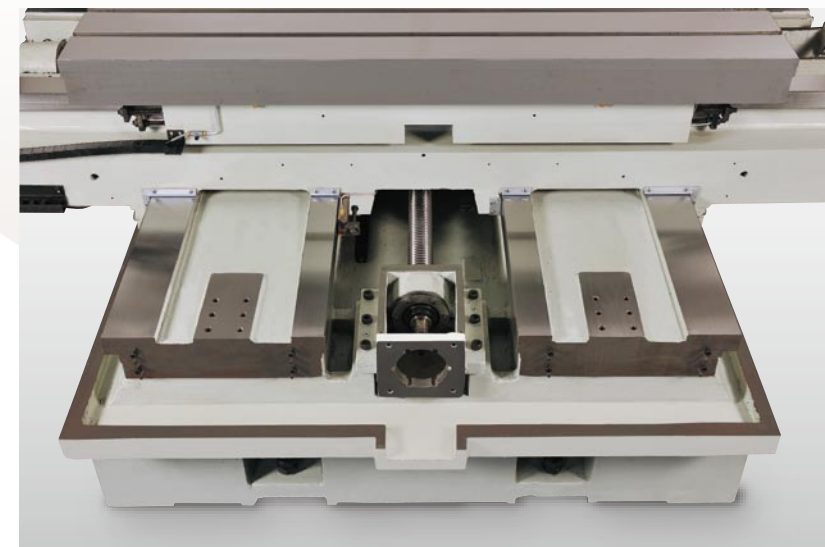
The oversized box ways combined with a greater span between slideways provides uniform load distribution of load, while guaranteeing high machining accuracy.

WEAR RESISTANT BOX WAYS

- All box ways are hardened and precision ground for uniform load distribution and to avoid saddle deformation.
- Way surfaces are coated with Turcite-B, featuring wear resistance, low friction coefficient, outstanding dampening capacity and smooth movement.

PRECISION BALL SCREWS

- The ball screws on three axes are directly coupled to motor, eliminating backlash and providing a high precision transmission effect.
- Ball screws are pre-tensioned to minimize thermal deformation.

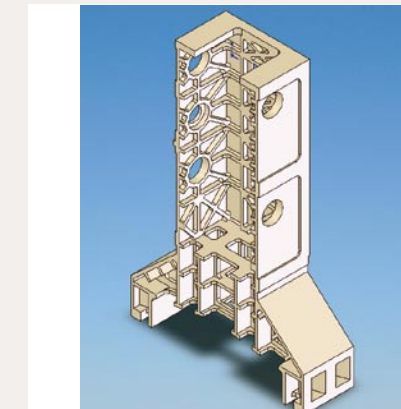
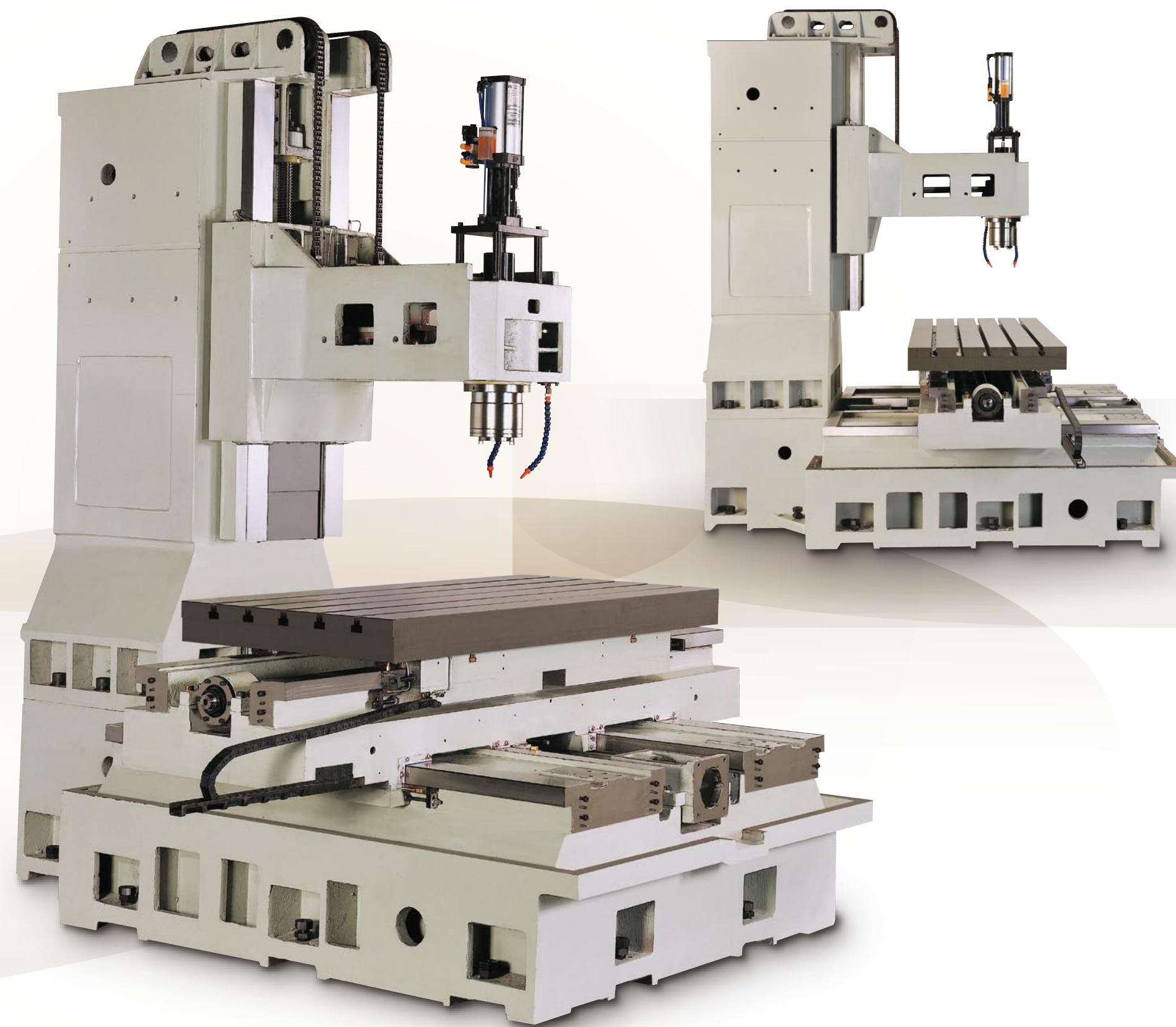


FOUR BOX WAYS ON BASE

The base is designed with 4 box ways. The oversized slideways in combination with a wide span between ways, allows the machine to perform heavy cutting with maximum stability.

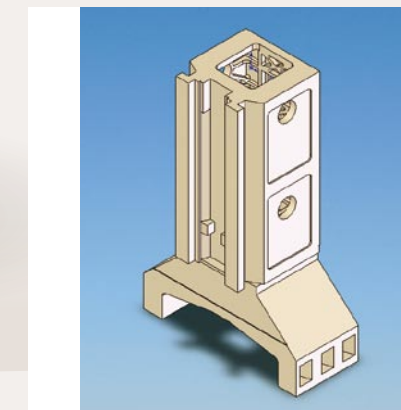
ANTI-BUMP DEVICE

Three axes are equipped with anti-bump devices for safety and protection of the machine.



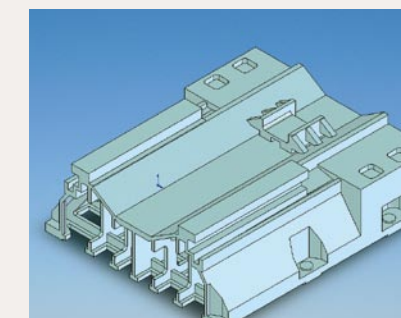
RIB REINFORCEMENT FOR INCREASED RIGIDITY

The box type constructed column is scientifically rib reinforced to achieve the best rigidity.



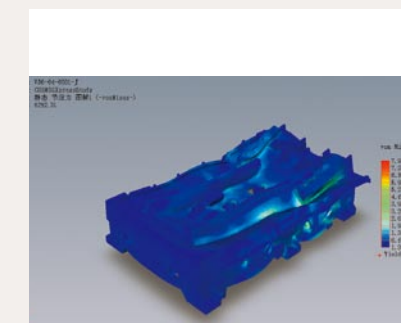
OVERSIZED COLUMN

The column is specially designed with an extra large bottom for greater stability.



MASSIVE BASE

The heavy base is a box type construction in combination with a greater span between slideways. This results in outstanding stability and machining accuracy.



OPTIMUM STRUCTURE THROUGH FEA ANALYSIS

To achieve the best rigidity, stability and dampening capacity of the machine, TOP-ONE engineers also utilize FEA software to analyze all structural parts. Each machine must exhibit minimum deformation and vibration, ensuring lifetime accuracy.

Gear Drive Spindle

4500 rpm / 6000 rpm



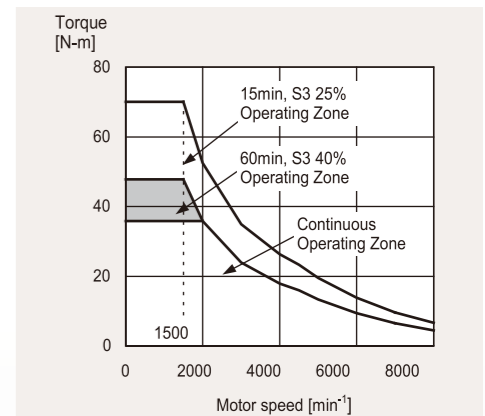
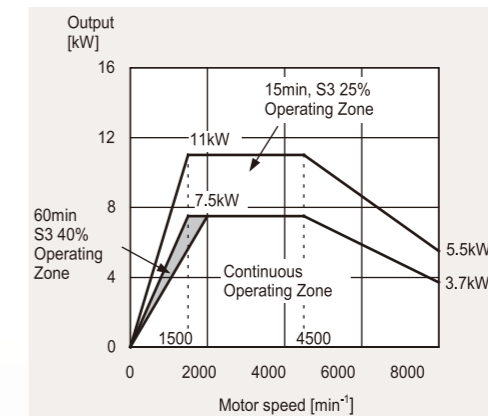
- The gear drive spindle provides 4500 rpm and 6000 rpm speeds to select from.
- High and low speed ranges for the spindle transmission make the machine suitable for heavy cutting in the low speed range. Also, ideal for fine finishing in the high speed range.
- The spindle taper is a BT40 or BT50, depending on the machine model.

Belt Drive Spindle

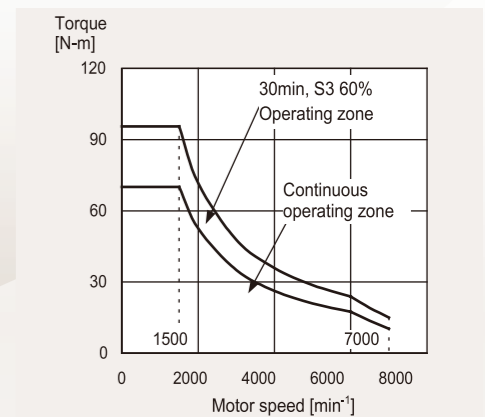
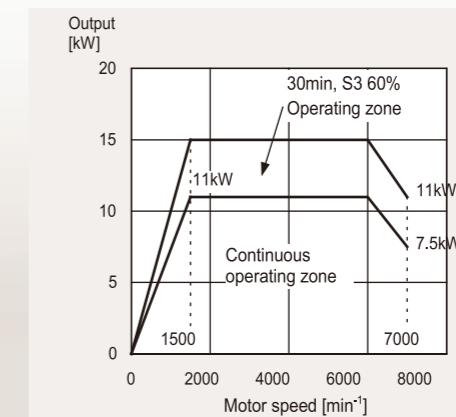
6000 / 8000 rpm

- The belt drive spindle provides 6000 and 8000 rpm to select from.
- The spindle taper is a BT40 or BT50, depending on the machine model.

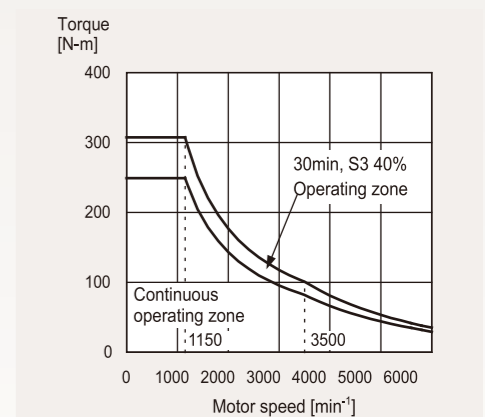
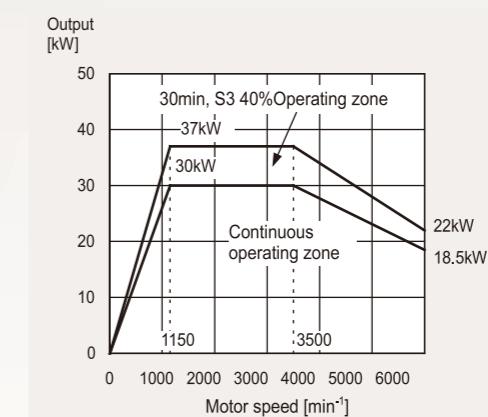
Model: β 8/800D



Model: α 12/700i0



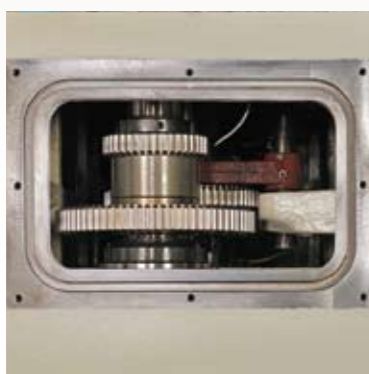
Model: α 30/600i0



TWO-STEP SPEED GEARBOX

Models: MCV-1100 / 1580 / 1690 / 1890

- The spindle running is transmitted through a gearbox, providing high/low speed change.
- The low speed range gives great torque output, making the machine excellent for heavy cutting. The high speed range is ideal for fine cutting with outstanding surface finish effect.
- All gears in the gearbox are carburized and precision ground for quiet running.



COOLANT JETS AROUND SPINDLE

The powerful coolant jets around the spindle are designed to remove heat from the cutting tool and workpiece.



REAR CHIP FLUSHING NOZZLES

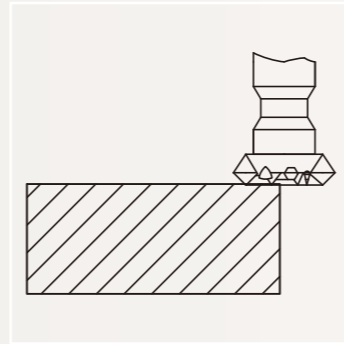
The flushing nozzles provided at the rear side of the base flush away metal chips during machining for efficient removal.





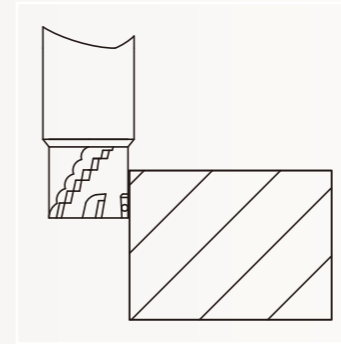
CUTTING TEST REPORT

MODEL: MCV-1100



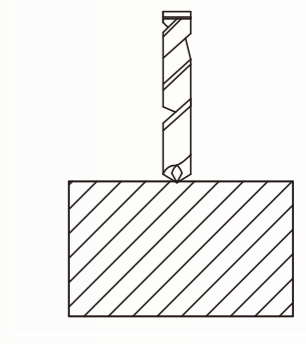
FACE MILLING

Cutting tool	Ø52 x 3t
Tangential speed	209.17 m/min
Cutting width	8 mm
Cutting depth	32 mm
Cutting federate	1300 mm/min
Cutting amount per tooth	0.37 mm
Material removal rate	498 c.c./min
Workpiece material	S45C
Spindle load	75%



END MILLING

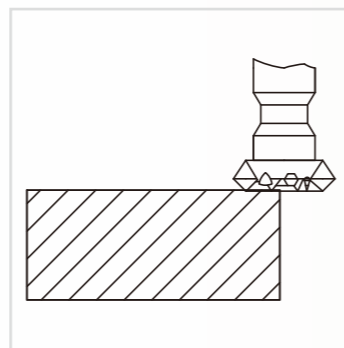
Cutting tool	Ø25 x 3t
Tangential speed	132.3 m/min
Cutting width	4 mm
Cutting depth	20 mm
Cutting federate	1000 mm/min
Cutting amount per tooth	0.17 mm
Material removal rate	162 c.c./min
Workpiece material	S45C
Spindle load	90%



DRILLING

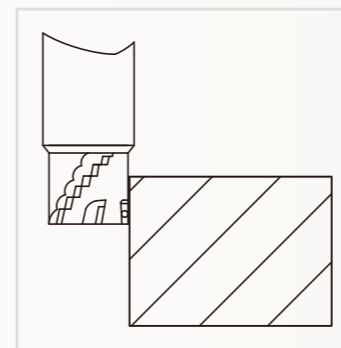
Tool diameter	Ø32 mm
Tool material	Alloy steel
Cutting depth	30 mm
Cutting federate	70 mm/min
Workpiece material	S45C
Spindle load	82%

MODEL: MCV-855



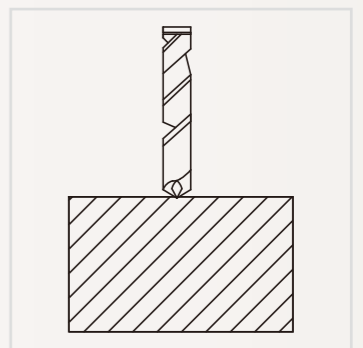
FACE MILLING

Cutting tool	Ø100 x 5t
Tangential speed	135.32 m/min
Cutting width	60 mm
Cutting depth	2 mm
Cutting federate	600 mm/min
Cutting amount per tooth	0.15 mm
Material removal rate	190 c.c./min
Workpiece material	S45C
Spindle load	101%



END MILLING

Cutting tool	Ø52 x 3t
Tangential speed	209.17 m/min
Cutting width	8 mm
Cutting depth	32 mm
Cutting federate	1300 mm/min
Cutting amount per tooth	0.37 mm
Material removal rate	498 c.c./min
Workpiece material	S45C
Spindle load	75%



DRILLING

Tool diameter	Ø25 mm
Tool material	Alloy steel
Cutting depth	30 mm
Cutting federate	80 mm/min
Workpiece material	S45C
Spindle load	68%

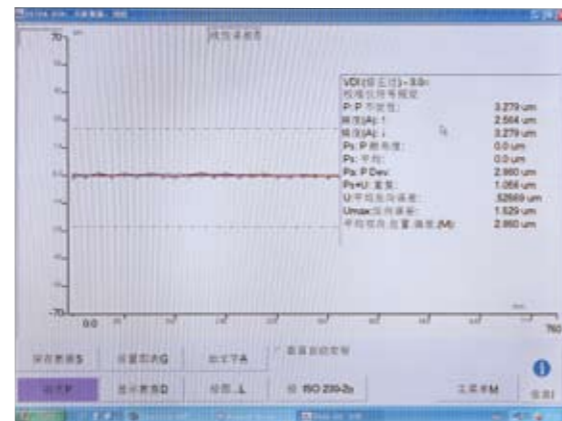
QUALITY ASSURANCE

TOP-ONE's reputation for quality excellence results from rigorous and thorough quality control.



LASER INSPECTION ON THREE AXES

Each machine is inspected using an advanced laser unit for calibration. The laser unit is applied for inspecting and calibrating the screw pitch error, backlash, positioning accuracy and repeatability. The precision inspection may ensure the dynamic and static ability of the machine and its machining accuracy.



ONLINE DYNAMIC BALANCE INSPECTION

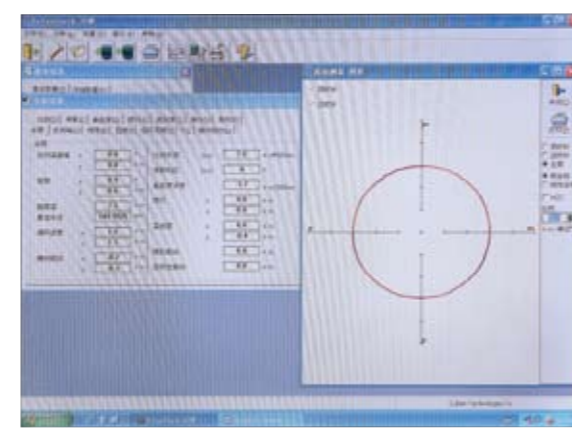
The online dynamic balance tester is used to inspect the speed, movement and acceleration conditions when the spindle runs at its highest speed.



BALL BAR TESTING

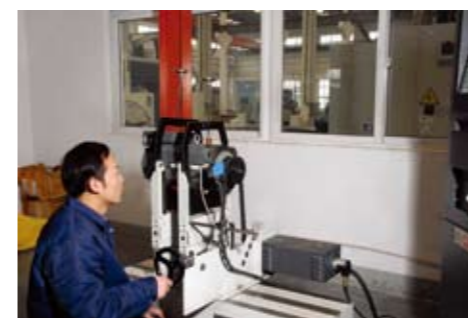
After assembly, each machine is tested by using the latest ball bar testing equipment. With ball bar testing, we can calibrate circularity and the machine's geometrical accuracy.

Circular cutting tests are also performed to ensure the 3D cutting accuracy and the circular smoothness.



DYNAMIC BALANCE CALIBRATION

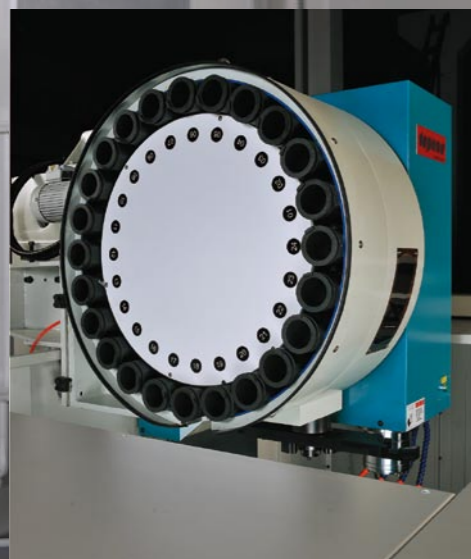
All spindle motors and spindles are subject to dynamic balance calibration before assembly. With the dynamic balance calibration, the spindle vibration is minimized during high speed running. This also results in high machining accuracy.





16 / 20 TOOLS ARMLESS TYPE MAGAZINE

- The magazine provides 16 or 20 tools to select from.
- Bi-directional random tool selection provides quick tool changes.
- The magazine accommodates a BT40 or BT50 tool shank.



20 / 24 TOOLS ARM TYPE MAGAZINE

- The magazine provides 20 or 24 tools to select from.
- Bi-directional random tool selection provides quick tool changes.
- The magazine accommodates a BT40 or BT50 tool shank.



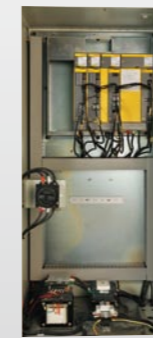
HIGH PRESSURE AUTOMATIC LUBRICATOR

- The high pressure forced automatic lubricator employs an oil distributor. Once pressure reaches peak, all lubrication points are released.
- The oil circuit features pressure detection and feed back. It can detect oil circuit jamming and leaks. This allows all lubrication points to be properly lubricated at all times, and ensures a longer service life and accuracy of the machine.



SPINDLE OIL COOLER

With the spindle oil cooler, thermal deformation of the spindle can be minimized. It is recommended for high speed and precise machining.



SEPARATED HIGH / LOW CURRENT (for MCV-1100)

The high/low current of the control circuits in the electrical cabinet are separated. This special design may prevent the electronic parts from burning out due to instant peak current. It also provides safety protection for maintenance personnel.

OPTIONAL ACCESSORIES



LINK CHAIN TYPE CHIP CONVEYOR

(Standard accessories for MCV-1580/1690/1890)

SPECIFICATIONS

MODEL	UNIT	MCV-855	MCV-1100	MCV-1370	MCV-1580	MCV-1690	MCV-1890
ITEM		3 Axes Box Ways	3 Axes Box Ways	3 Axes Box Ways	3 Axes Box Ways	3 Axes Box Ways	3 Axes Box Ways
TABLE							
Working surface	mm	460 x 950	660 x 1200	710 x 1400	800 x 1700	900 x 1800	900 x 2000
T-Slots (size x number)	mm	18 x 5	18 x 5	18 x 5	22 x 5	22 x 5	22 x 5
Max. table load	kg	600	1000	1000	1500	1600	1600
Distance from table work surface to floor	mm	830	930	880	1000	1050	1050
TRAVEL							
Longitudinal travel (X)	mm	800	1100	1300	1500	1600	1800
Cross travel (Y)	mm	500	660	700	800	900	900
Vertical travel (Z)	mm	500	560	680	700	650 (Belt) 650 (Gear)	650 (Belt) 650 (Gear)
Distance from spindle nose to table	mm	130-630	160-720 (Belt) 170-730 (Gear)	150-830	150-850	170-820 (Belt) 240-890 (Gear)	172-820 (Belt) 240-890 (Gear)
Distance from spindle center to column surface	mm	550	700	785	800	950	950
SPINDLE							
Spindle taper		BT40	BT40	BT50	BT50	BT50	BT50
Spindle speeds	rpm	8000	8000 (Belt) 6000 (Gear)	6000	6000	6000 (Belt) 4500 (Gear)	6000 (Belt) 4500 (Gear)
Spindle speed range		1	1 (Belt) 2 (Gear)	1	1	1 (Belt) 2 (Gear)	1 (Belt) 2 (Gear)
Spindle cooling / lubrication method	Oil / Grease	C04PT	C04PT	C04PT	C04PT	C04PT	C04PT
Gear box				Gear SHC-027X (60L)			
FEED							
Cutting feed	mm/min	1~10000	1~10000	1~10000	1~10000	1~10000	1~10000
Rapid feed (X/Y/Z)	m/min	12 / 12 / 12	30 / 30 / 20	12 / 12 / 12	12 / 12 / 12	12 / 12 / 12	12 / 12 / 12
Min. cutting feed	mm	0.001	0.001	0.001	0.001	0.001	0.001
MOTOR							
Spindle motor	kw	7.5 / 11	7.5 / 11	15 / 18.5	15 / 18.5	15 / 18.5	15 / 18.5
3-Axes motor (X/Y/Z)	kw	1.8 / 1.8 / 2.5	4 / 4 / 4	4 / 4 / 4	7 / 7 / 7	7 / 7 / 7	7 / 7 / 7
Coolant pump	kw	0.56	1.64 x 2	1.64	1.64	1.64	1.64
Water tank capacity	m ³	0.24	1.84	0.29	0.62	0.38	0.38
AUTOMATIC TOOL CHANGER							
ATC type		Armless / Arm	Arm	Arm	Arm	Arm	Arm
Tool shank		BT40	BT40	BT50	BT50	BT50	BT50
Tool storage capacity		16 / 20 / 24	20 / 24	20 / 24	20 / 24	20 / 24	20 / 24
Max. tool (diameter x length)		Ø90 x 300	Ø90 x 300	Ø110 x 300	Ø110 x 300	Ø110 x 300	Ø110 x 300
INSTALLATION REQUIREMENT							
Power	KVA	25	25	45	45	45	45
Pneumatic pressure	kg/cm ²	5~7	5~7	5~7	5~7	5~7	5~7
Pneumatic flowrate	l/min	100	100	100	100	100	100
Floor space	mm	2750 x 2200 x 2700	3250 x 2850 x 3000	3500 x 2900 x 3350	4310 x 3100 x 3200	4900 x 3100 x 3350	4900 x 3100 x 3350
Net weight	kg	6000	7600	10000	13000	16500	16500

Note: Due to continuous research and development, the machine design and specifications are subject to change without prior notice.

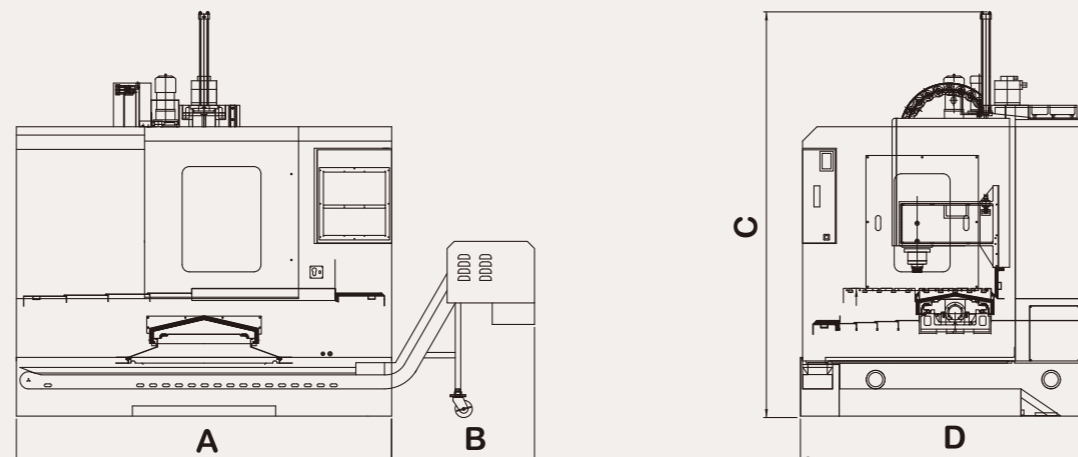
STANDARD ACCESSORIES

- Fanuc / Mitsubishi control system
- Fully enclosed splash guard / Semi-Fully enclosed splash guard (MCV-1690/1890)
- Rigid tapping
- Automatic lubrication system
- RS-232 interface
- Work lamp
- Automatic power off
- Spindle air blast
- Leveling bolts & pads
- Electrical handwheel
- Tool box with tools & operation manual
- Call light
- Table guard
- Oil circulating cooling system for spindle
- Transformer
- Heat exchanger for electrical cabinet
- Oil pressure box (for gear head)

OPTIONAL ACCESSORIES

- Armless ATC (16 or 20 Tools) (MCV-855 only)
- Arm ATC (20 or 24 Tools)
- Rotary table (4th axis)
- Chip conveyor (standard accessories for MCV-1580/1690/1890)
- Export packing
- Digital readout system

MACHINE DIMENSIONS



MODEL	Dimensions				Unit: mm
	A	B	C	D	
MCV-855	2620	1000	2840	2050	
MCV-1100	3250	1000	3000	2850	
MCV-1370	3500	1000	3350	2900	
MCV-1580	4310	1000	3200	3100	
MCV-1690	4900	1000	3350	3100	
MCV-1890	4900	1000	3350	3100	

• MCV-1100 with Nitrogen Gas Counter Balancing System