VERTICAL
MACHINING CENTER

Linear Ways Series

www.topone-m.com

TOP-ONE MACHINERY CO., LTD

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.

TOP-ONE MACHINERY CO., LTD.

No. 2-161, Shen Qing Road, Dong Shan Village
Qing Shui District, Taichung City 436, Taiwan
Tel: +886-4-2620-2901
Fax: +886-4-2620-2955
http://www.topone-m.com
E-mail: topone@topone-m.com

VERTICAL MACHINING CENTER

Linear Ways series

TOP-ONE

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

MCV-L1100

HIGH SPINDLE SPEED!
HIGH RAPID TRAVERSE RATE!

- X, Y, Z-axis travel: 1100 x 520 x 560 mm
- BT40 spindle taper
- Belt drive: 8,000 rpm (standard)
  Direct Drive: 10,000, 12,000, 15,000 rpm (option)
- Linear ways on X, Y, Z-axis
- Arm type: 20/24 Tools
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle oil cooler is standard equipment

MCV-L540

HIGH SPEED CUTTING TO
GIVE YOU THE WINNING EDGE!

- X, Y, Z axis travel: 560 x 400 x 400 mm
- BT40 spindle taper
- The direct drive spindle provides 10,000, 12,000 or 15,000 rpm
- Linear ways on X, Y, Z-axis
- 16 Tools arm type automatic tool changer
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle cooler is standard equipment

MCV-L855

A HIGH SPEED VMC LEADS TO
EFFICIENCY AND PROFIT

- X, Y, Z-axis travel: 800 x 500 x 550 mm
- BT40 spindle taper
- Belt drive: 8,000 rpm (standard)
  Direct Drive: 10,000, 12,000, 15,000 rpm (option)
- Linear ways on X, Y, Z-axis
- Arm type: 20/24 Tools
- Fully enclosed splash guard
- Fanuc / Mitsubishi control system
- Spindle cooler is standard equipment

PERFECT STRUCTURAL DESIGN
GIVES YOU BETTER QUALITY CUTTING AT HIGH SPEED

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

Specially designed greater span between slideways ensures load distribution is uniform, guaranteeing machining accuracy.

HEAVY DUTY LINEAR WAYS

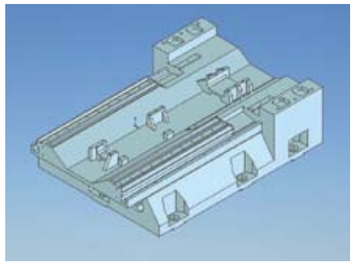
The three axes are equipped with heavy duty linear ways, which are preloaded to minimize thermal deformation and remain firmly supported at both ends. This helps to optimize moving rigidity and maintains consistent accuracy.

STRAIGHTNESS INSPECTION DURING ASSEMBLY

During installations of the linear ways, their horizontal and vertical straightness is inspected for dependable geometric accuracy.

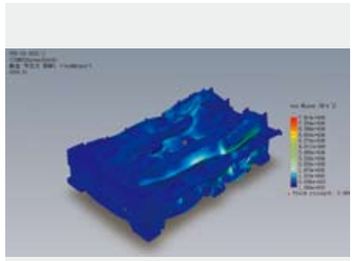
X-axis: 2 linear ways
Y-axis: 2 linear ways
Z-axis: 2 linear ways

X-axis: 2 linear ways
Y-axis: 2 linear ways
Z-axis: 2 linear ways



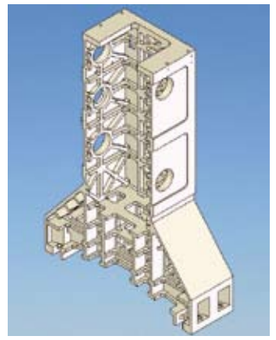
MASSIVE BASE

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



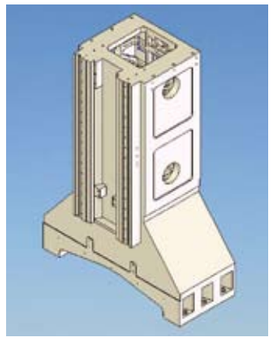
OPTIMUM STRUCTURE THROUGH FEA ANALYSIS

To achieve the best rigidity, stability and dampening capacity in 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.



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.

SPINDLE

DIRECT DRIVE SPINDLE

(MCV-L540 Standard)

(MCV-L855 / L1100 Option)

- The direct drive spindle provides 10,000, 12,000 or 15,000 rpm
- The spindle taper is BT40
- The high speed spindle dramatically upgrades machining efficiency and surface finish of cut.

Belt Drive Spindle

(MCV-L855 / L1100 Standard)

- The belt drive spindle:8000 rpm

COOLANT JETS AROUND SPINDLE

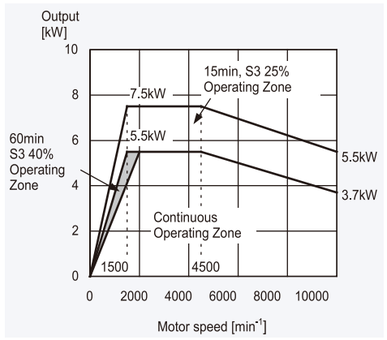
The powerful coolant jets around the spindle are designed to remove heat from the cutting tool and workpiece.

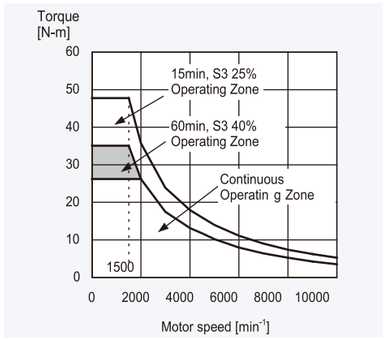
REAR CHIP FLUSHING NOZZLES

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

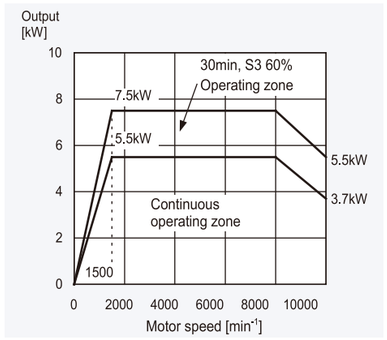
POWER OUTPUT DIAGRAM

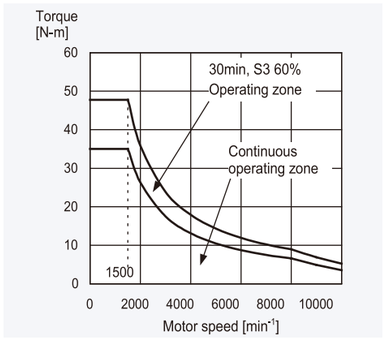
Model: β 6/10000



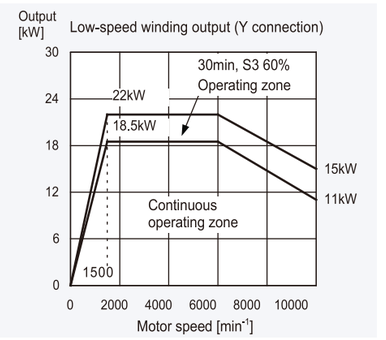


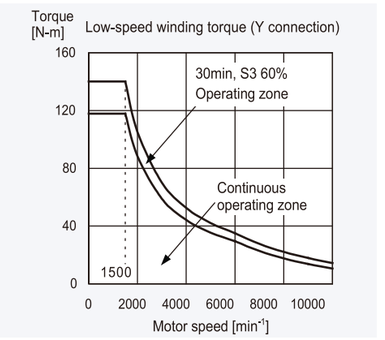
Model: α 6/10000





Model: α 8/10000





CUTTING TEST EXAMPLES

WORKPIECE: **3D CURVIC SURFACES**

Workpiece material	**Aluminum**
Cutting tools	**D25, D10R1, R4, D16, R3**
Cutting methods	**Wcut, Surclr, profile**
Spindle speeds	**1500-14,000 rpm**
Feed rates	**400-3000**
Total machining time	**4 h, 52 min**

WORKPIECE: **3D CURVIC SURFACES**

Workpiece material	**Aluminum**
Cutting tools	**E10R1, R3, R2**
Cutting methods	**Rough & fimish**
Spindle speeds	**7,000-30,000 rpm**
Feed rates	**3,000-4,000**
Total machining time	**4 h, 27 min**

WORKPIECE: **MOLD**

Workpiece material	**Aluminum**
Cutting tools	**E10.0, R3, R1.5, R0.75**
Cutting methods	**Rough & fimish**
Spindle speeds	**10,000-30,000 rpm**
Feed rates	**1000-6000**
Total machining time	**2 h, 7 min**

WORKPIECE: **VALVE BODY**

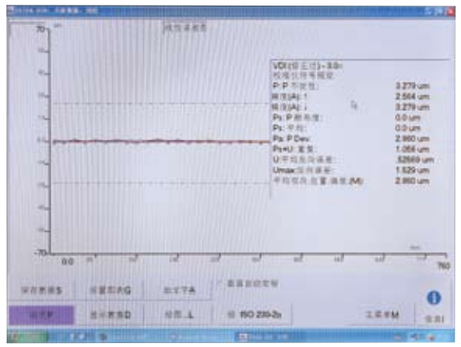
Workpiece material	**Aluminum**
Cutting tools	**D8R1, R3, R1.5**
Cutting methods	**Rough & finish**
Spindle speeds	**7000-17,000 rpm**
Feed rates	**2500-3500**
Total machining time	**2 h, 48 min**

QUALITY ASSURANCE

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

LASER INSPECTION ON THREE AXES

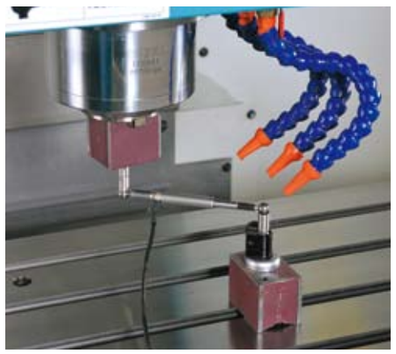
Each machine is inspected using an advanced laser unit for calibration. The laser unit is applied for inspecting and calibrating the screw pitch error, backlash, positioning accuracy and repeat-ability. The precision inspection may ensure the dynamic and static ability of the machine and its machining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

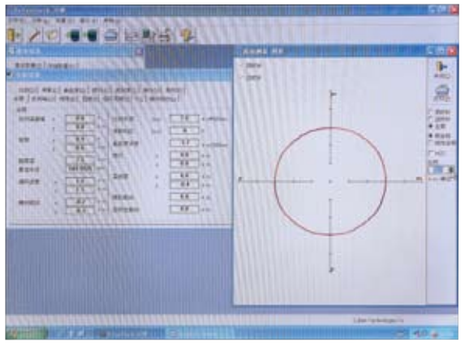


BALL BAR TESTING

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.

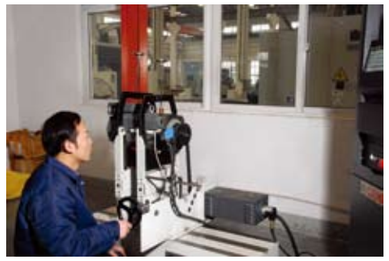
Circular cutting tests are also performed to ensure the 3D cutting accuracy and the circular smoothness.

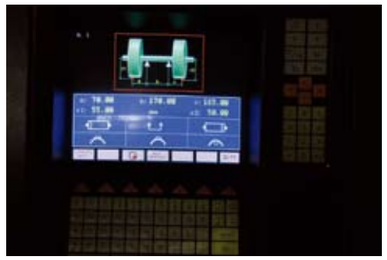




ONLINE DYNAMIC BALANCE INSPECTION

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





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.

STANDARD ACCESSORIES

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.

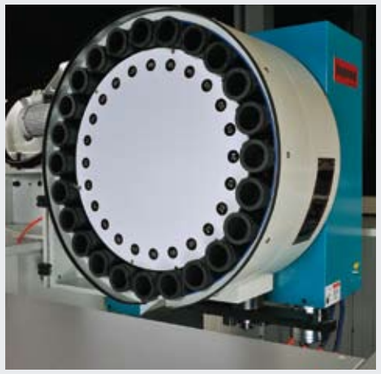
SPINDLE OIL COOLER

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 (MCV-L855 / L1100 only)

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

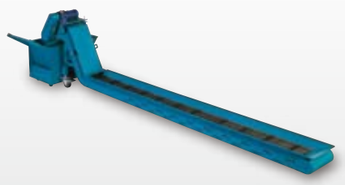


20 / 24 TOOLS ARM TYPE MAGAZINE

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

OIL WATER SEPARATING TANK

The oil water separating tank prevents cutting fluid's deterioration and odors. This results in longer life of the cutting fluid and reduces fluid waste.



LINK CHAIN TYPE CHIP CONVEYOR

SPECIFICATIONS

MODEL	UNIT	MCV-L540	MCV-L855	MCV-L1100
ITEM				
TABLE				
Working surface	mm	420 x 700	500 x 1000	600 x 1200
T-Slots (mumber x size x pitch)	mm	3 x 14 x 100	5 x 18 x 100	5 x 18 x 100
Max. table load	kg	300	600	1000
TRAVEL				
Longitudinal travel (X)		560	800	1100
Cross travel (Y)	mm	400	500	520
Headstock travel (Z)	mm	400	500	560
Distance between spindle end	mm	325-725 (with raiser) /	130~630	150~710
and table top	mm	130-530 (Standard type)		
SPINDLE				
Type of tool shank		BT40	BT40	
spindle speeds	rpm	DDS 10000 (std.) / 12000, 15000 (opt.)	Belt 8000 (std.) DDS 10000, 12000, 15000 (opt.)	
Spindle speed range		1	1	
Spindle cooling / Lubrication method		Oil / Grease lubrication	Oil / Grease lubrication	
FEED				
Cutting feed	mm/min	1~10000	1~10000	
Rapid traverse (X/Y/Z)	m/min	36 / 36 / 30	30 / 30 / 24	48 / 48 / 36
Minimum input increment	mm	0.001	0.001	
ATC				
Type		Arm	Arm	
Tool holder		BT40	BT40	BT40
Tool storage capacity	tools	16 / 20	20 / 24	
Max. tool weight	kg	8	8	8
Max. tool dia. of adjacent pots are empty	mm	150	150	
Tool selection		Random	Random	Random
Tool change time	sec	3	3	3
MOTORS				
Spindle motor	kW	7.5	7.5 / 11	7.5 / 11
X axis	kW	1.6	3	3
Y axis	kW	1.6	3	3
Z axis	kW	3.0	3	4
INSTALLATION REQUIREMENTS				
Power	KVA	15	25	25
Voltage	V	220V / 50Hz	220V / 50Hz	220V / 50Hz
Pneumatic pressure	kg/cm^2	6~8	6~8	6~8
Pneumatic flowrate	l/min	100	100	100
Floor space	mm	1850 x 2290 x 2650	2620 x 2050 x 2840	3250 x 3000 x 3000
Net weight	kg	2800	5500	6700

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
- 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

- Arm ATC (16 / 20 / 24 Tools)
- Rotary table (4th axis)
- Chip conveyor
- Export packing
- Oil water separating tank