

Trust & Technology



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# High Speed Machining Center MDV-508

High ■Quality ■Precision ■Efficiency ■Economy

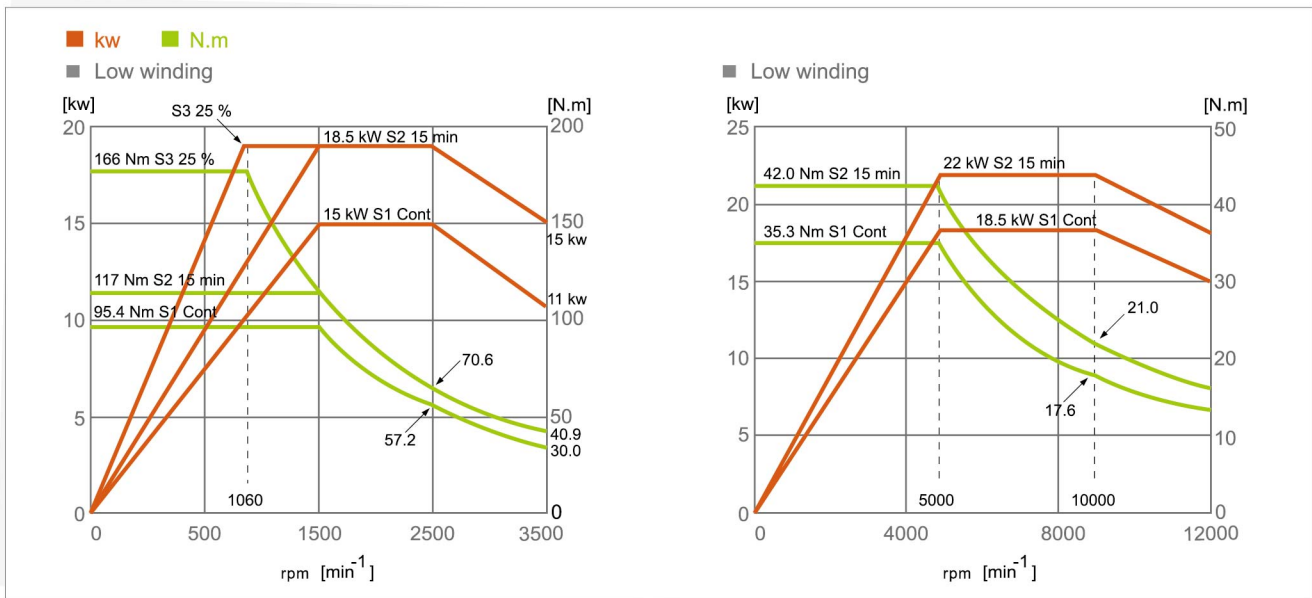


Tongtai Machine & Tool Co., Ltd.

# MDV-508 Forceful! High Speed! Vertical

The newest way for parts machining and mold & die high-speed milling and cutting

## High power spindle 12000 rpm



### Stroke specification

- X=850 mm Y=500 mm Z=530 mm
- X/Y/Z axis rapid traverse 24/24/24 m/min  
30/30/30 m/min (optional)
- Workpiece load MAX. 500kg

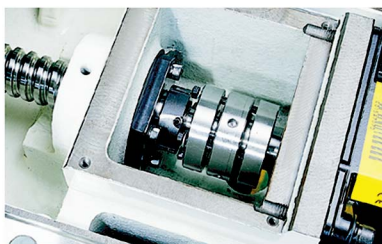
BT-40/HSK-63A (optional)



- 22/18.5 kw
- 7/24 TAPER NO.40
- Oil grease lubrication
- Advanced dual mechanical design. The pull stud force is 1000 kg. The stud release force is only 250 kg. This design extends the life time of spindle bearing.

### Dual auger type chip conveyor

Excellent chip disposal performance.

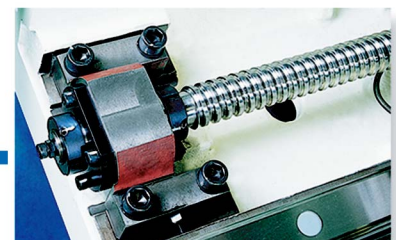


### Rigid type coupling

Ensure  $\mu\text{m}$  fine feeding and no backlash accuracy.

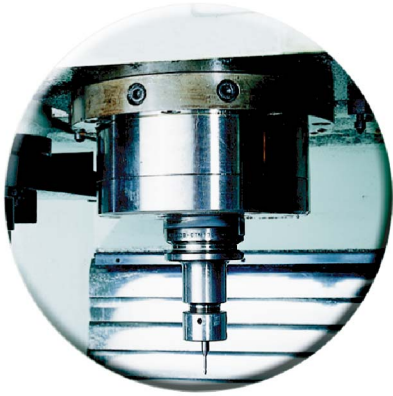
### Ball screw

Use pre-loaded mechanism to reduce effect upon thermal expansion during machining.

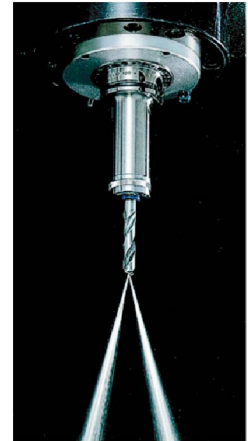
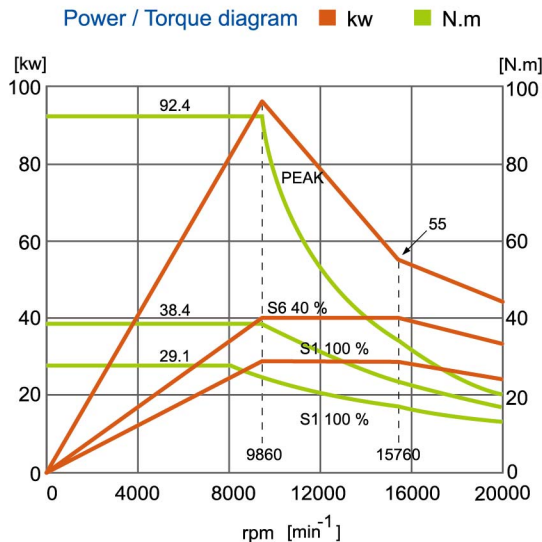


# High Speed Milling & Cutting Machining Center

High power spindle 20000 rpm



- 45/30 kw
- BBT-40/HSK-63A
- Oil grease lubrication



Coolant through spindle  
15 kg/cm<sup>2</sup> (optional accessories)  
12000 rpm type



- Front door open width achieves 900 mm.
- Easy for lifting jig and fixtures.
- High rigidity machine structure designed for high-speed milling and cutting. Excellent vibration-absorption to ensure accuracy, stability and long life.
- Special servo driving mechanism. During high speed feeding, there will be no distortion in driving. This prevents heat expansion.
- Machine size : LxWxH 2870x2000x2810, save floor space.
- Machine weight : 6300 kg



Main electrical cabinet

Air conditioner for internal temperature control (optional)



Swivel operation panel

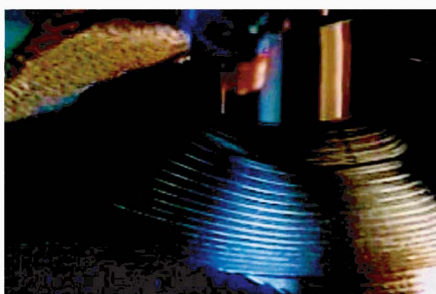
Controller FANUC 0iM (Standard)

## Controller FANUC 0i-M (standard)

0i-M High speed high precision machining function(optional)

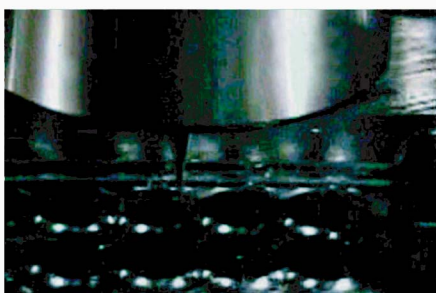
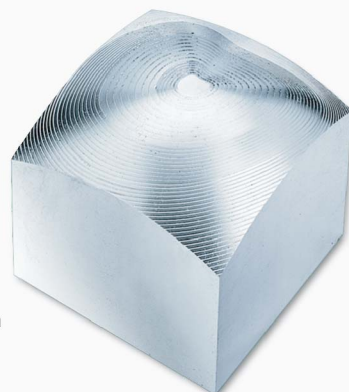
- Data server
- NURBS Interpolation function
- Look-ahead 180 blocks
- HPCC64 RSIC High precision control function

# Examples of Machining



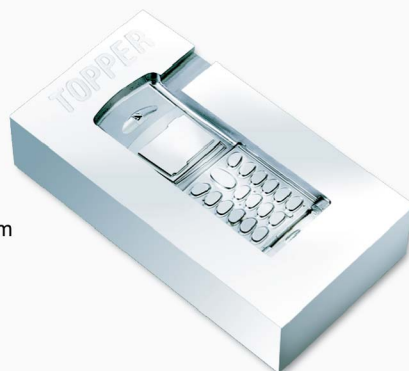
## Lamp mold

Tool : 0.1R ball nose end mill  
 Speed : 20000 rpm  
 Feedrate : 1000 mm/min  
 Machining time : 9.8 hr  
 Material : NAK80、HRC 40°  
 Workpiece size : 120×120×80 mm



## Cellphone mold

Tool : 0.3R ball nose end mill  
 Speed : 18000 rpm  
 Feedrate : 1200 mm/min  
 Machining time : 5.25 hr  
 Material : NAK80, HRC 40°  
 Workpiece size : 80×180×50 mm



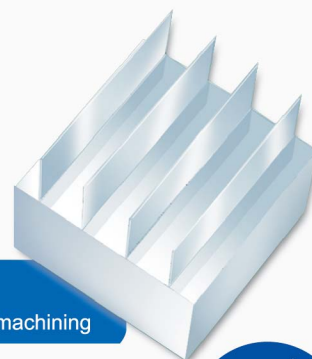
## Fan mold

Machining time : 5.45 hr  
 Material : MAK 80, HRC 40°



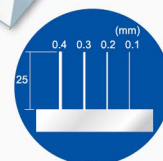
## Forging mold

Machining time : 4.8 hr  
 Material : SKD 61, HRC 52°  
 Workpiece size : 100x100x35 mm



## Thin wall machining

Speed : 20000 rpm  
 Feed rate : 8000 mm/min  
 Material : AL 7075  
 Thin wall : 0.4/0.3/0.2/0.1 mm



## Crankshaft Mold

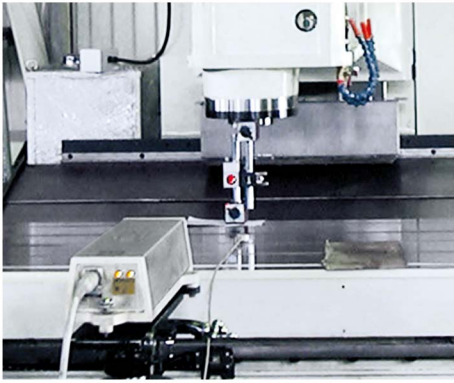
Tool : Ø3 ball nose end mill  
 Speed : 13000 rpm  
 Feedrate : 2200 mm/min  
 Finishing time : 1.1 hr  
 Material : SKD II, HRC 60°  
 Workpiece size : 80x50x30 mm



## Connecting rod

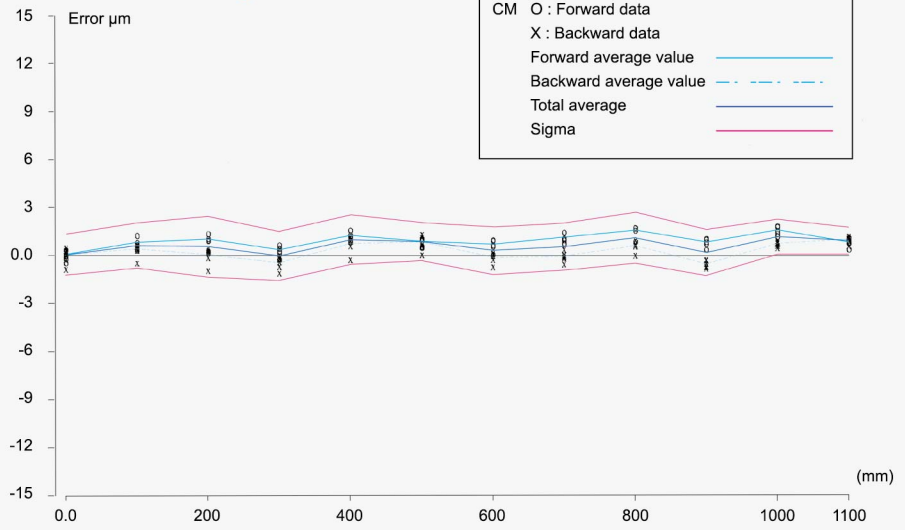
Material : NAK 80 (HRC 40°)  
 Workpiece size : 300x180x40 mm  
 Machining time : 4.5 hr

# Performance and Accuracy Test



	Positioning accuracy	Repeatability
VDI3441 (Germany)	0.01 mm aully stroke	0.003 mm

## Linear Error Diagram for X-Axis



### Numerical analysis

P : P infinite :	4.222 $\mu\text{m}$
Accuracy F :	3.600 $\mu\text{m}$
Accuracy R :	4.039 $\mu\text{m}$
Ps : P diffuse :	2.823 $\mu\text{m}$
Ps : Average :	2.110 $\mu\text{m}$
Pa : P DEV :	1.225 $\mu\text{m}$
Rs+U : Repeatability :	3.776 $\mu\text{m}$
Original accuracy :	2.946 $\mu\text{m}$
Original accuracy :	2.306 $\mu\text{m}$
Original accuracy :	2.411 $\mu\text{m}$
Original repeatability :	2.301 $\mu\text{m}$
Original repeatability :	1.086 $\mu\text{m}$
Original repeatability :	1.389 $\mu\text{m}$
U : Mean Rv E :	.6311 $\mu\text{m}$

Machine name : Vertical machining center

File date and time : 2001/08/13 09:20:09 AM

Place : TONGTAI

### Environment data

	Min.	Max.	Average
Temp	29.05	29.26	29.16
Pressure	756.76	756.83	756.79
Air humidity	75.0	75.0	75.0
MT1 temp.	30.82	30.88	30.85
MT2 temp.			
MT3 temp.			

Expansion coefficient : 11.7 PPM /  $^{\circ}\text{C}$

THP TR265 Version 3.29	<b>20000 rpm type</b>	S=18000 rpm F=4000 mm/min
<b>LS ROUNDNESS RESULTS</b>		
Feature name	11174	
Feature no.	02	
R	53.873 mm	
O	5.55 $\mu\text{m}$	
E	0.98 $\mu\text{m}$	
$\angle$	140.6 deg	
$\sphericalangle$	6.16 $\mu\text{m}$	
Scale	2.00 $\mu\text{m}$	
Z height	112.9 $\mu\text{m}$	
Datum	SPINDLE	
Filter type	2CR	
Filter	1-500 $\mu\text{pr}$	
Profile	100.0 %	
Meas. mode	External	
Meas. date	19-04-2000	
Meas. time	08:52:59	

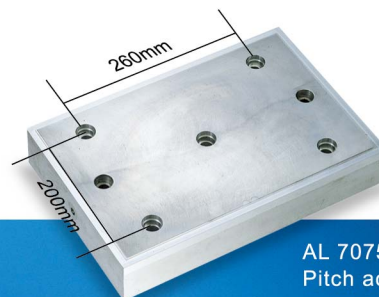
● End milling circular differential accuracy

THP TR265 Version 3.29	<b>12000 rpm type</b>	S=10000 rpm F=2000 mm/min
<b>LS ROUNDNESS RESULTS</b>		
Feature name	10658	
Feature no.	05	
R	105.67 mm	
O	7.56 $\mu\text{m}$	
E	1.17 $\mu\text{m}$	
$\angle$	218.6 deg	
$\sphericalangle$	4.23 $\mu\text{m}$	
Scale	10.00 $\mu\text{m}$	
Z height	40.9 $\mu\text{m}$	
Datum	SPINDLE	
Filter type	2CR	
Profile	100.0 %	
Meas. mode	External	

● The position accuracy for boring and hole differential



AL 7075



AL 7075  
Pitch accuracy 0.012 $\mu\text{m}$

\*Data was created on room temp. 20 $^{\circ}\text{C} \pm 1^{\circ}$  and in good foundation.

# MDV-508 Standard Specifications

Item	Specification	Unit	MDV-508
Table	Working area (L×W)	mm	950×500
	Max. load capacity	kg	500
	Table height from floor	mm	900
	T-Slot (size×No.)	mm	18×5
Spindle	Spindle nose		7/24 Taper No. 40 (HSK-63A)
	Spindle speed	rpm	Built-in type 12000 (Opt. 20000)
	Spindle bearing diameter	mm	Ø65
Stroke	X/Y/Z axis stroke	mm	850/500/530
	Spindle nose to table	mm	100-630
Feed	X/Y/Z rapid traverse	m/min	24/24/24 (Opt. 30/30/30)
	Cutting feedrate	mm/min	1-10000
ATC	Tool shank		BT-40 (Opt. HSK-63A,BBT-40)
	Tool sapacity	pc	24
	Max. tool diameter	mm	Ø80
	Max. tool diameter (w/o adjacent tool)	mm	Ø125
	Max. tool length	mm	250
	Max. tool weight	kg	7
Motor	Spindle motor (50% ED)	kw	22/18.5 (Opt. 45/30)
	X/Y/Z axis servo motor	kw	3.0/3.0/4.0
	Coolant motor	kw	0.37
Machine size	L×W×H	mm	2870×2000×2810
	Weight	kg	6300

## Standard accessories

- Spindle speed 12000 rpm
- Spindle nose BT-40
- Air blower unit
- Rigid tapping
- Halogen
- Coolant unit
- Automatic lubrication equipment
- Door interlock unit
- Spindle cooler unit

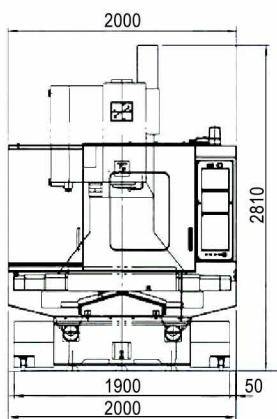
## Optional accessories

- Spindle speed 20000 rpm
- Spindle nose HSK-A63 / BBT-40
- Transformer / Stabilizer
- Auto door
- Fully enclosed guard
- Linear scale
- Coolant through spindle
- Tool length automatic measuring unit
- Tool life management
- Tool breakage detector
- Function modular package A
- Function modular package B
- Oil skimmer / Oil & mist collector
- Chip conveyor / Chips tank
- 4th-axis function
- A/C for electrical cabinet
- M code
- Auto power off
- Sub operation box

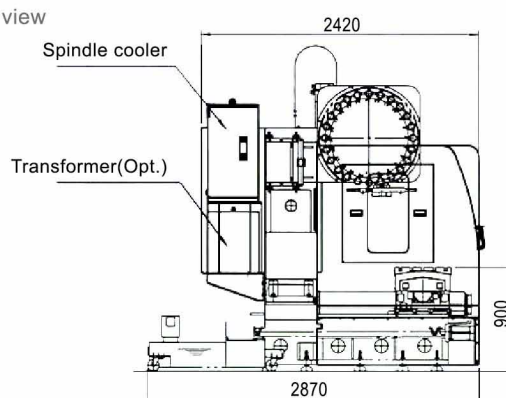
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## Machine Dimensions

■ Front view



■ Side view



## Tongtai Machine & Tool Co., Ltd.

• HEAD OFFICE  
NO.3, LUKE 3rd. RD., LUZHU DISTRICT, KAOHSIUNG CITY, 82151, TAIWAN.  
TEL : 886-7-9761588 FAX : 886-7-9761589/886-7-9761590  
Website : <http://www.tongtai.com.tw>

• TAOYUAN OFFICE TEL : 886-3-4551399 FAX : 886-3-4559730  
• TAICHUNG OFFICE TEL : 886-4-23589313 FAX : 886-4-23588913  
• TONGTAI SEIKI U.S.A INC. TEL : 1-845-2675500 FAX : 1-845-2675546  
• Tongtai Machine & Tool Japan Co., Ltd TEL : 81-4-71438355 FAX : 81-4-71438360  
• TONGTAI SEIKI VIETNAM LIMITED TEL : 84-435112529  
• EUROPE OFFICE TEL : 31-161-454639 FAX : 31-161-454768  
• THAILAND OFFICE TEL : 66-2-7443440 FAX : 66-2-3986518  
• INDONESIA OFFIC TEL : 62-21-45850521 FAX : 62-21-45840522  
• MALAYSIA OFFICE TEL : 60-3-78456815 FAX : 60-3-78456851

• CHINA OFFICE  
SHUZHOU TONG-YU MACHINE & TOOL CO., LTD.  
TEL : 86-512-63430168 FAX : 86-512-63431622  
E-mail : [sales@tong-yu.com.cn](mailto:sales@tong-yu.com.cn)

• WUHAN OFFICE TEL : 86-27-59409109 FAX : 86-27-59409110  
• SHANGHAI OFFICE TEL : 86-21-24208138 FAX : 86-21-34073262  
• CHONGQING OFFICE TEL : 86-23-67865925 FAX : 86-23-67867717  
• GUANGZHOU OFFICE TEL : 86-755-27222119 FAX : 86-755-27222115  
• TIANJIN OFFICE TEL : 86-22-24417640 FAX : 86-22-24416738