

Spindle

The spindle housing has grooves for coolant circulation. While performing heavy cutting or high speed cutting, the circulated cooling system effectively removes spindle heat. The cooling system eliminates spindle deformation due to over heating and eliminates inaccuracy due to the spindle thermal growth, while ensuring long service life of the spindle bearings. The draw bar has a stainless steel ball to hold the tool shank firmly. Spiral circulated grooves on the spindle sleeve, incorporated with the spindle oil cooler system is standard. This efficiently removes the generating heat, providing the best solution for spindle accuracy and long term operation.

Belt Driven Spindle System



Direct Driven Spindle System(Optional):

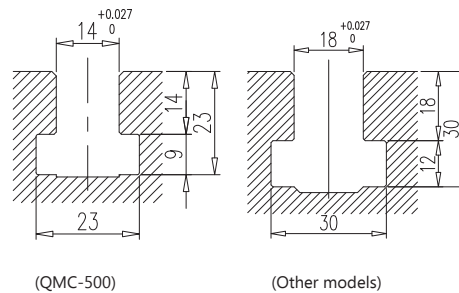
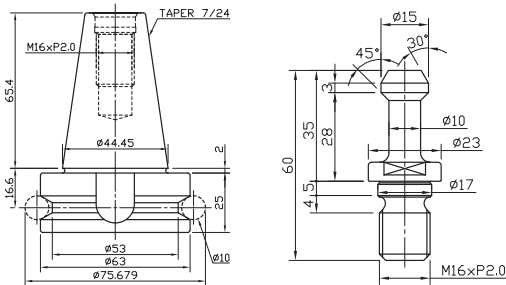
- Spindle is driven directly by coupling. This results in no power loss, low noise, and low vibration.



Specification of tool holder and pull stud(BT-40)

Size of T-Solts

MAS403 P40T-1 (45°)



Static accuracy inspection: (Test depends on our standard operation and environment)

Right angle	Surface	Standard value (μm / 300 m)	Testing value (μm / 300 m)
	X-Y / Y-Z / Z-X	0.015 / 0.015 / 0.015	0.007 / 0.010 / 0.011
Roundness cutting accuracy	Surface	Standard value (μm)	Testing value (μm)
	X - Y	0.015	0.01

Machining ability analysis: (Workpiece: S45C)

Working: Drilling	Working: Tapping	Working: Face mill
Dia.(mm) x Rapid (mm / rev.) ø32 × 0.1	Dia.(mm) x Pitch (mm / rev.) M20 × 2.5	Width (mm) x Deep x Rapid (mm/rev.) 308: 80 × 3.4 × 1100

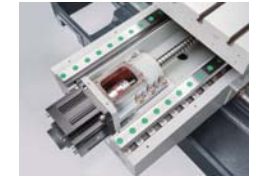
(Base on some specific model & optional motor)



The German ZF 2-speed gear box, provides maximum cutting ability in low speed.



The direct driven, pretensioned design of the Grade C3 Ball Screw (Ø50 HQM-1480/1680) eliminates noise, while increasing the stability, accuracy and rigidity of the machine.



Various CNC Controllers



Chip Conveyor (optional)

During machining, chips are flushed into the chip auger, then delivered to chip tray. This ensures a cleaner working area at all time. Please choose the most suitable chip conveyor accordance to your machining chip scenario.

Chip type	Curly Iron Chip	Steel Mold Chip	Cast Iron Chip	Curly Aluminum Chip	Aluminum Chip	Flake Chip	Powder Chip
Conveyor type							
Link type	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Screw type	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Scraper type	⊙	⊙	⊙	⊙	⊙	⊙	⊙

⊙ Best efficiency ⊙ Above average efficiency ⊙ Other possible choices

Quality & Inspection



Measurement by Laser



Measurement by Ball-bar



Measurement of geometric accuracy



Measurement of spindle runout



Measurement of geometric accuracy



Measurement of geometric accuracy



Measurement of straightness accuracy



Measurement of inspection for hardness



Measurement of inspection by 2D coordinate



Measurement of parallelism and concentricity

Example A

Material : **Aluminum**
Unit:mm

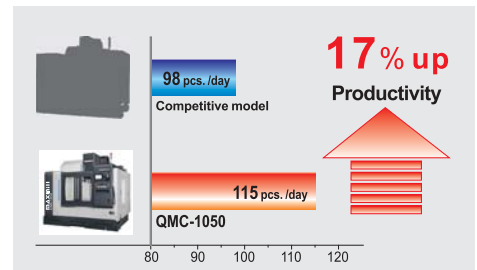
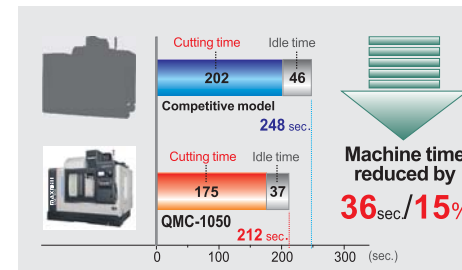


Comparison of production volume

- Running time(one day):
 $8\text{hours} \times 85\% = 3,600\text{sec.} \times 8 \times 0.85 = 24,480\text{ sec.}$
- Number of days operation in 1 year:
 $21\text{ days} \times 12\text{months} = 252\text{days}$
- Production volume per day(pcs./day):
 $24,480\text{sec.} \div \text{Cycle time(sec.)}$

Cycle time comparison

Number of tools used: 6 Tools



Example B

Material : **Aluminum Die-Cast**
Unit : mm

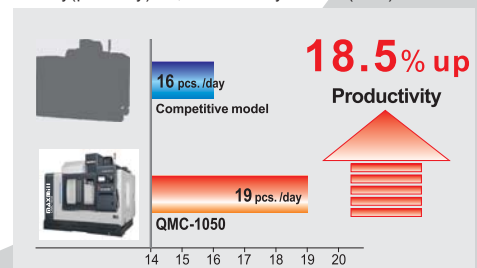
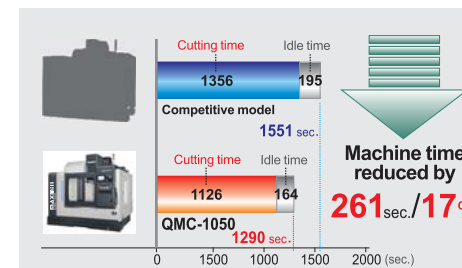


Comparison of production volume

- Running time(one day):
 $8\text{hours} \times 85\% = 3,600\text{sec.} \times 8 \times 0.85 = 24,480\text{ sec.}$
- Number of days operation in 1 year:
 $21\text{ days} \times 12\text{months} = 252\text{days}$
- Production volume per day(pcs./day):
 $24,480\text{sec.} \div \text{Cycle time(sec.)}$

Cycle time comparison

Number of tools used: 6 Tools, 3 Process



Model	Unit	QMC-500	QMC-600	QMC-850	QMC-1050	HQM-1060	HQM-1260	HQM-1480	HQM-1680	
TRAVEL	X x Y x Z axis	mm(inch) 510 x 400 x 320 (20.0 x 15.7 x 12.5)	610 x 410 x 530 (24.1 x 16.2 x 20.8)	850 x 550 x 560 (33.5 x 21.7 x 22.1)	1,050 x 550 x 560 (41.4 x 21.7 x 22.1)	1,060(1,100opt) x 650 x 630 (41.7 x 25.6 x 24.8)	1,200 x 650 x 630 (47.3 x 25.6 x 24.8)	1,400 x 800 x 750 (55.2 x 31.5 x 29.6)	1,600 x 800 x 750 (63.0 x 31.5 x 29.6)	
	Spindle nose to table	mm(inch) 150-470(5.9-18.5)	100-630(4.0-24.8)	120-680(4.8-26.8)	120-680(4.8-26.8)	100-730(4.0-28.8)	100-730(4.0-28.8)	STD:75-825(3.0-32.5)(BT40) OPT:40-790(1.6-31.1)(BT50)	STD:75-825(3.0-32.5)(BT40) OPT:40-790(1.6-31.1)(BT50)	
	Spindle center to solid column surface	mm(inch) 474(18.6)	495(19.5)	600(23.7)	600(23.7)	700(27.6)	700(27.6)	863(34.0)	863(34.0)	
TABLE	Work area	mm(inch) 660 x 400(25.9 x 15.7)	710 x 410(27.9 x 16.1)	950 x 500(37.4 x 19.7)	1,150 x 500(45.3 x 19.7)	1,350 x 600(53.2 x 23.7)	1,350 x 600(53.2 x 23.7)	1,550 x 700(61.1 x 27.6)	1,750 x 700(68.9 x 27.6)	
	Max. Table Load	lbs. 550	660	1100	1545	1940	1940	2200	2650	
	T-Slots(No. x Width x Pitch)	mm(inch) 3 x 14 x 125(3 x 0.5 x 4.9)	3 x 18 x 125(3 x 0.7 x 5.0)	4 x 18 x 125(4 x 0.7 x 5.0)	4 x 18 x 125(4 x 0.7 x 5.0)	4 x 18 x 130(4 x 0.7 x 5.2)	4 x 18 x 130(4 x 0.7 x 5.2)	5 x 18 x 125(5 x 0.7 x 5.0)	5 x 18 x 125(5 x 0.7 x 5.0)	
SPINDLE	Tool shank	-	BT-30	CAT-40	CAT-40	CAT-40	CAT-40	STD: CAT-40 / OPT: CAT-50	STD: CAT-40 / OPT: CAT-50	
	Speed	rpm	20,000	15,000	15,000	15,000	12,000	12,000	STD:10,000(CAT-40) OPT:8,000(CAT-50)	
	Transmission	-	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Belt Drive	
	Bearing lubrication	-	Grease	Grease	Grease	Grease	Grease	Grease	Grease	
	Cooling system	-	Oil cooled	Oil cooled	Oil cooled	Oil cooled	Oil cooled	Oil cooled	Oil cooled	
	Spindle motor max.rating (MITSUBISHI)	HP	10	10	10	15	15	15	CAT-40: 20 / CAT-50: 25	
	Spindle motor max.rating(FANUC)	HP	4.9 / 10	10 / 15	15 / 20	15 / 20	15 / 20	15 / 20	CAT-40: 20 / CAT-50: 25	
	Axis motor max.rating(MITSUBISHI)	HP	2 / 2 / 4	2 / 3 / 4	2 / 3 / 4.0	2.7 / 4.7 / 4.7	2.7 / 4.7 / 4.7	2.7 / 4.7 / 4.7	4.7 / 4.7 / 4.7	
Axis motor max.rating(FANUC)	HP	2.4 / 2.4 / 3.4	2.4 / 2.4 / 3.4 (STD) 4.0 / 4.0 / 5.4 (OPT)	2.4 / 2.4 / 3.4 (STD) 4.0 / 4.0 / 5.4 (OPT)	3.4 / 3.4 / 3.4 (STD) 4.0 / 4.0 / 5.4 (OPT)	3.4 / 3.4 / 3.4 (STD) 4.0 / 4.0 / 5.4 (OPT)	3.4 / 3.4 / 3.4 (STD) 4.0 / 4.0 / 5.4 (OPT)	5.4 / 5.4 / 5.4		
FEED RATES	Rapids on X&Y&Z axis (linear guideway)	IPM	1890 / 1890 / 1890	1890 / 1890 / 1890	1417 / 1417 / 1417	1417 / 1417 / 1417	1575 / 1575 / 1180	1575 / 1575 / 1180	1180 / 1180 / 984	
	Max.cutting feedrate	IPM	394	394	394	394	590	590	394	
TOOL MAGAZINE	Tool storage capacity	Tools	16 turret	20 (24) arm	24 (30) arm	24 (30) arm	24 (30) arm	24 (30) arm	24 (30) arm	
	Type of tool (optional)	type	BT-30 turret type	BT-40(CAT-40)	BT-40(CAT-40)	BT-40(CAT-40)	BT-40(CAT-40)	BT-40(CAT-40)	STD: BT-40 (CAT-40) OPT: BT-50 (CAT-50)	
	Max.tool diameter	mm(inch)	60 (2.3) turret	76 (3.0) arm	76 (3.0) arm	76 (3.0) arm	76 (3.0) arm	76 (3.0) arm	76 (3.0) arm (BT-40) 110 (4.3) arm (BT-50)	
	Max.tool weight	lbs.	7	11	15	15	15	15	15 (CAT-40) 33 (CAT-50)	
	Max.tool length	mm(inch)	200(7.8) turret	250(9.8) arm	300(11.8) arm	300(11.8) arm	300(11.8) arm	300(11.8) arm	300(11.8) arm	
AVG.CHANGING TIME(ARM)	Tool to tool	sec.	1.4	2.5	2.7	2.7	2.7	2.7	2.7(BT-40) / 3.8(BT-50)	
	Air source required		85 PSI	85 PSI	85 PSI	85 PSI	85 PSI	85 PSI	85 PSI	
ACCURACY OVER FULL TRAVEL	Positioning	VDI 3341	mm(inch) P0.01(0.0004)	P0.01(0.0004)	P0.01(0.0004)	P0.01(0.0004)	P0.01(0.0004)	P0.01(0.0004)	P0.01(0.0004)	
	Repeatability	VDI 3341	mm(inch) Ps0.006(0.0003)	Ps0.006(0.0003)	Ps0.006(0.0003)	Ps0.006(0.0003)	Ps0.006(0.0003)	Ps0.006(0.0003)	Ps0.006(0.0003)	
DIMENSION	Machine weight (Net)	LBS	6,620	8,820	13,010	13,890	16,535	16,975	25,575	
	Power source required	KVA	15	15	15	15	20	20	30	
	Floor space (L x W x H)	mm(inch)	1,700 x 2,400 x 2,400 (66.9 x 94.5 x 94.5)	1,900 x 2,260 x 2,600 (74.8 x 89.0 x 105.4)	2,700 x 3,000 x 2,870 (106.3 x 118.2 x 113.0)	2,850 x 3,000 x 2,870 (112.2 x 118.2 x 113.0)	3,340 x 3,160 x 2,800 (131.5 x 124.4 x 110.2)	3,640 x 3,100 x 2,850 (143.3 x 122.0 x 112.2)	3,930 x 3,200 x 3,050 (157.7 x 125.9 x 120)	4,330 x 3,200 x 3,050 (170.5 x 125.9 x 120)
	Shipment advice	-	1 x 40'HQ(4 sets)	1 x 40'HQ(4 sets)	1 x 40'HQ(3 sets)	1 x 40'HQ(3 sets)	1 x 40'HQ(1 set)	1 x 40'HQ(1 set)	1 x 40'HQ(1 set)	

※All specifications are subject to change without prior notice ※Machine colors shown in this catalog are for reference only Correct colors are dependent on the actual machine.

STANDARD ACCESSORIES

- Mitsubishi M80 controller
- Spindle speed 8,000 / 10,000, 12,000 / 20,000 rpm (Depending on machine model)
- Automatic tool changer
- Full splash guard
- Heat exchanger for electric cabinet
- Automatic lubricating system
- Spindle air blast system(M code)
- Spindle oil cooler
- Spindle air curtain
- Spindle orientation
- Coolant gun and air socket
- Leveling kits
- Removable Manual Pulse Generator (M.P.G)
- LED lighting
- Rigid tapping
- Coolant system and tank
- Cycle finish indicator and alarm light
- RS-232C interface with cable(10m)
- Tool box
- Operational and maintenance manual
- Transformer(M/F)
- Twin-chip auger(rear-out)(HQM-1260)
- Spindle coolant ring(M code)
- Chip flush

*(M/F),means Mitsubishi & Fanuc controller

OPTIONAL ACCESSORIES

- Spindle speed 12,000rpm(Belt driven)
- Spindle speed 12,000 / 15,000rpm(Direct Drive)
- Coolant through spindle(CTS)
- Controller(Fanuc/Siemens/Heidenhain)
- German ZF gear box
- Automatic tool length measuring device
- Automatic work piece measuring system
- 4th axis rotary table and tailstock
- Oil skimmer
- Link type chip conveyor with chip bucket
- Linear scales(X/Y/Z axis)
- Coolant through tool holder
- Centrifugal coolant filter
- Spindle coolant ring