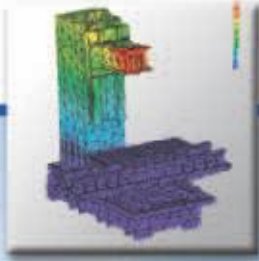


CHEVALIER®

Grinding / Turning / Milling



QP Box Way Series Vertical Machining Center

QP2033 • 2040 • 2443

QP2033 / QP2040

VERTICAL MACHINING CENTER

MACHINE INTRODUCTION

■ Spindle Speed

#40 : Belt Driven 10,000rpm
Directly Coupled : 12,000rpm / 15,000rpm (Optional)
Belt Driven : 8,000rpm / 12,000rpm (Optional)

■ Tool Capacity

24 Arm type
32 Chain type (Optional)

■ Rapid on (X / Y / Z) Axes

24 / 24 / 20 m/min (945 / 945 / 787 ipm)

■ Control

Fanuc 0iMD
Siemens 828D (with ShopMill)
Heidenhain iTNC530

2



QP2040 : (W) 2,800 x (L) 2,115mm

Note: Machine shown with optional accessories

QP2443

VERTICAL MACHINING CENTER

MACHINE INTRODUCTION

■ Spindle Speed

#40 : Belt Driven 8,000rpm
Directly Coupled : 12,000 / 15,000rpm (Optional)
Belt Driven : 10,000 / 12,000rpm (Optional)

#50 : Belt Driven 6,000rpm
Directly Coupled : 10,000rpm (Optional)
Belt Driven : 8,000rpm (Optional)
Gear Driven : 6,000rpm (Optional)

■ Tool Capacity

#40: 24 Arm type, 32 Chain type (Optional)
#50: 24 Arm type, 32 Chain type (Optional)

■ Rapid on (X / Y / Z) Axes

#40: 20 / 20 / 18 m/min (787 / 787 / 709 ipm)
#50: 20 / 20 / 15 m/min (787 / 787 / 591 ipm)

■ Control

Fanuc 0iMD
Siemens 828D (with ShopMill)
Heidenhain iTNC530

QP2443 : (W) 3,060 x (L) 2,458mm

Note: Machine shown with optional accessories



QP2033 / QP2040 / QP2443

MACHINE CONSTRUCTION



QP2033 / 2040



Quick Floating Type Tool Release System

- Big cylinder diameter design cooperates with floating type tool unclamping system, provides quick tool release and protects spindle accuracy and longevity.



Tool measurement (Optional)



QP2033 / QP2040

High accuracy ballscrews

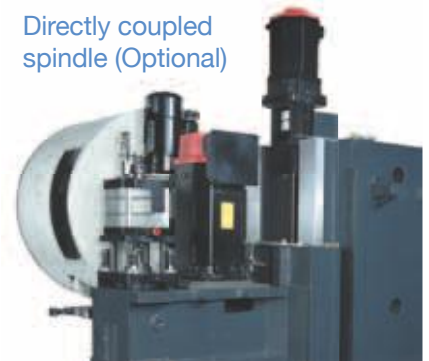
- 3-axes C3 pretensioned ballscrew, $\text{\O}40\text{mm} \times \text{P}10\text{mm}$.

X / Y one piece motor seat with machine base and saddle

- Unlike bolts tightened motor seat, this new design provides much higher accuracy and rigidity!



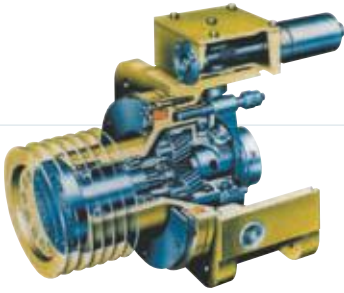
Directly coupled spindle (Optional)



- Belt driven spindle: 10,000rpm standard (Optional: 8,000 / 12,000rpm)
- Optional directly coupled spindle: 12,000rpm (Other optional: 15,000rpm)

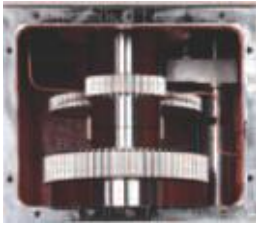
High Accuracy Spindle Design #40

- Large spindle diameter design, $\text{\O}70\text{mm}$ front spindle bearing inner diameter, with ABEC Class 7(P4) super high precision angular contact ball bearings, fully support radius and axial thrust force.



Optional ZF gearbox (Optional)

- Providing high torque in low spindle speed for heavy duty cutting, drilling and tapping.
- Max. 8,000rpm(For #40 Spindle)



Heavy-Duty Gear Type Headstock (Optional for QP2443 #50 Spindle only)

- The gear-type spindle is supported by Class 7(P4) NN-type double roller bearings in front and Class 7(P4) angular contact thrust ball bearings with inner diameter of $\varnothing 90\text{mm}$ ($\varnothing 3.54\text{''}$), which is very stiff and suitable for heavy-duty machining. (For QP2443 #50 only)



- Spindle air purge
- Coolant through spindle (Optional)

20Bar~70Bar Coolant-Through-Spindle (Optional)

- Providing high pressure coolant, this spindle can efficiently take out chips and heat from deep hole machining, greatly enhancing tool cutting performance and longevity as well as parts accuracy.

Big span column seat design

- One piece big slant Y-axis chip guard is used in the rear side of saddle for easy chip flow. (QP2033 / 2040)
- Y-axis box way span 800mm, foundation bolts span 1,030mm. (QP2040)



QP2443



QP2443

High Precision Double-Nut Ballscrews and Guide Ways

- 3-axes transmission adopt high precision 40mm (1 5/8") Class C3 direct-coupled and pre-tensioned ballscrews, which ensures maximum rigidity during heavy cuts. Both backlash and pitch errors are precisely compensated by laser calibration equipment to obtain accuracy movement.
- The slideways on the 3-axes are hardened and precision ground. Way surfaces are coated with Turcite-B and carefully hand-scraped for smooth and stable movement. Y-axis heavy-duty 4-track saddle guide way design bears the weight evenly to eliminate overhang and slide deformation.(QP2443)

QP2033 / QP2040

MACHINE CONSTRUCTION

Chain



Drum Arm

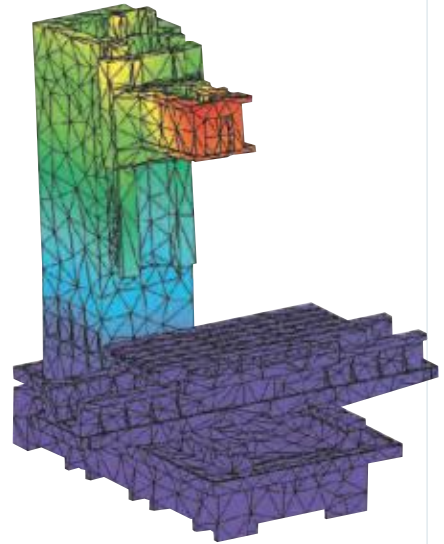


A.T.C Mechanism		Drum Arm	Chain
Tool Capacity	#40	24	32(Optional)
	#50	24	32(Optional)

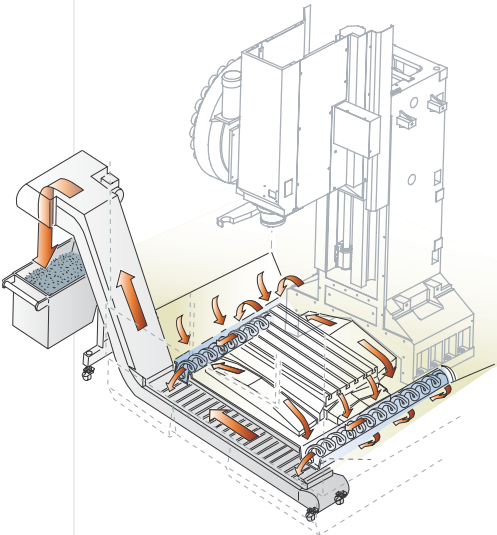
※ #50 for QP2443 only.

3D Integrated Design and Finite Elements Analysis

- The geometric model of the machine was created by 3D computer software to avoid blind spot. The structure analysis was carried out with the help of the Pro/MECHANICA to ensure superior stability and rigidity.

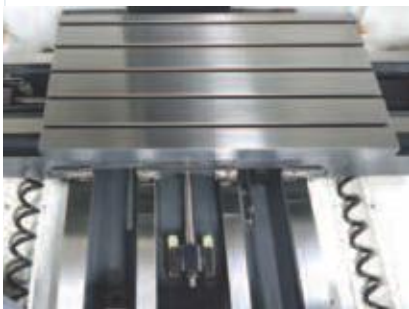


6



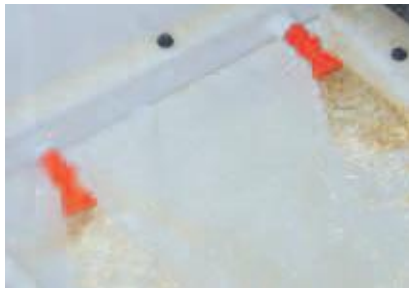
Rigid Structure

- Cast iron construction with rib design resists flexing and vibration during heavy machining.



X / Y / Z Box ways

- 3-axes box ways are hardened and precision ground. Box Way surfaces are coated with Turcite-B and hand-scraped for smooth movement.
- Y-axis stroke 530mm (20.8"), suitable for mold and die industry and job shop's machining.(QP2033 / QP2040)
- Crossfeed dual chip auger (Optional)



Rear Chip Flushing Device

- The powerful optional Rear Chip Flushing Device efficiently removes hot chips from bottom enclosure and rear side Y-axis telescope cover. The maximum volume is 150L/min.



Easy Chip Flow Splash Guard Design

- Big slant chip guard design for easy chips flow. Rear flood coolant nozzles are standard.

QP-L Series

CONTROL



- 1 3-axes simultaneous controllable
- 2 Linear interpolation
- 3 Circular interpolation
- 4 Helical interpolation
- 5 Exact stop G09
- 6 Skip function G31
- 7 Automatic acceleration / deceleration
- 8 Plane select G17, G18, G19
- 9 Polar coordinate command G15 / G16
- 10 Workpiece coordinate system G52~G59
- 11 Scaling G50 / G51
- 12 Automatic override for inner corners G62
- 13 Coordinate system rotation G68 / G69
- 14 Rigid tapping M29
- 15 Program date input G10
- 16 Canned cycles for drilling
- 17 Tool function
- 18 Tool length compensation
- 19 Tool offset memory 400 piece
- 20 Part program storage length: 800m (0iMD)
- 21 Number of registerable program: 400 (0iMD)
- 22 Background editing
- 23 Manual guide 0i
- 24 0iMD color 8.4" LCD

Standard Control

- FANUC 0iMD
8.4" TFT LCD color monitor

Other Control Available (Optional)

- FANUC 31iM
10.4" TFT LCD color monitor
- HEIDENHAIN iTNC530 HSCI
15" TFT LCD color monitor
- SIEMENS 828D Control
10.4" TFT LCD color monitor and "ShopMill" software

HEIDENHAIN iTNC530 HSCI Control



- 1 LCD color
- 2 Linear interpolation
- 3 Circular interpolation
- 4 Helical interpolation
- 5 Skip function
- 6 Plane select
- 7 Workpiece coordinate system
- 8 Coordinate system rotation
- 9 Rigid tapping
- 10 Mirror image, scaling, rotation
- 11 Canned cycles for drilling / milling
- 12 Tool function
- 13 Tool length / radius compensation
- 14 Part program storage length: 256KB
- 15 Number of registerable programs: 50
- 16 Background editing

SIEMENS 828D Control

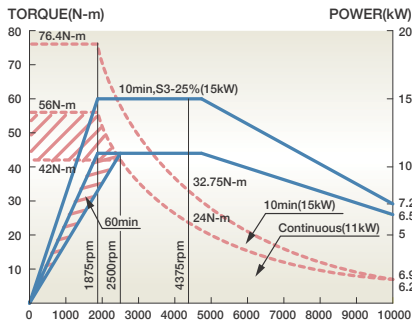


- 1 Contouring control for machines with up to 18-axes and controlled spindle
- 2 HEIDENHAIN inverter systems and motors recommended
- 3 Uniformly digital with HSCI interface and EnDat interface
- 4 TFT color flat-panel display, 19- or 15-inch
- 5 Storage medium: HDR hard disk with 160 GB / SSDR solid state disk with 32 GB
- 6 Programming in HEIDENHAIN conversational format, with smarT.NC or according to DIN / ISO
- 7 Standard milling, drilling and boring cycles
- 8 Touch probe cycles
- 9 FK free contour programming
- 10 Special functions for fast 3-D machining
- 11 Short block processing time (0.5ms)
- 12 Automatic calculation of cutting data
- 13 Pallet management

SPINDLE OUTPUT CHARACTERISTIC CHARTS

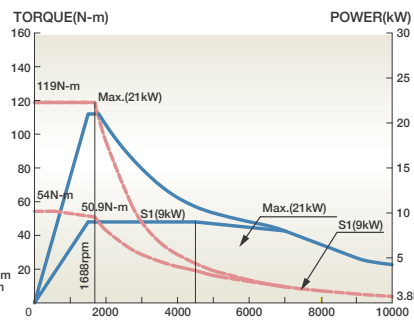
QP2033 / QP2040

1. 10,000rpm FANUC β 12i Spindle Motor



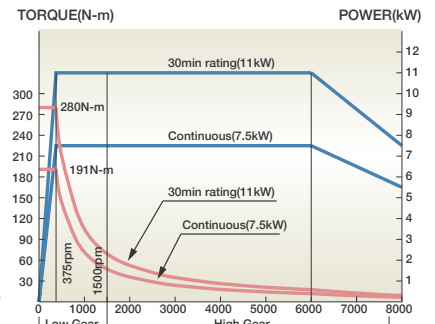
Spindle Speed (rpm)

2. 10,000rpm SIEMENS 1PH 8107 Spindle Motor



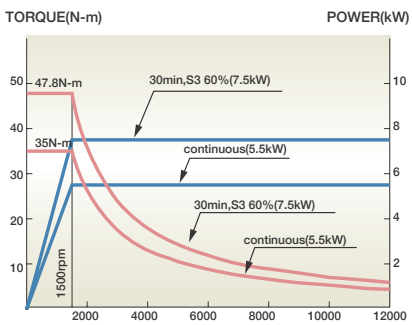
Spindle Speed (rpm)

3. 8,000rpm with ZF Gear Box FANUC α 8i Spindle Motor



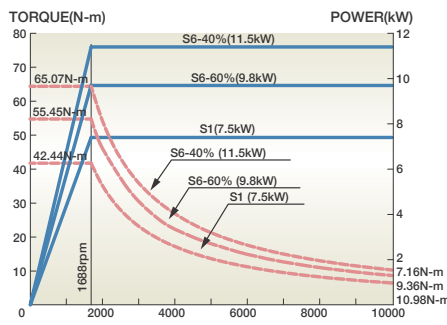
Spindle Speed (rpm)

4. Directly coupled 12,000rpm FANUC α 6i (7.5kW) Spindle Motor



Spindle Speed (rpm)

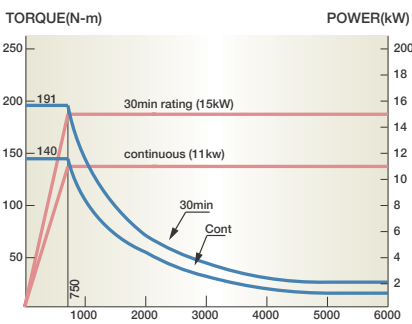
5. 10,000rpm HEIDENHAIN QAN-200L Spindle Motor



Spindle Speed (rpm)

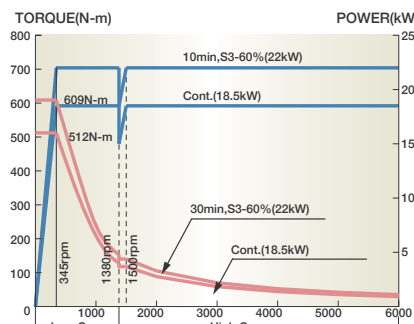
QP2443

1. #50, 6,000rpm Spindle FANUC α p22i (15kW) Spindle Motor



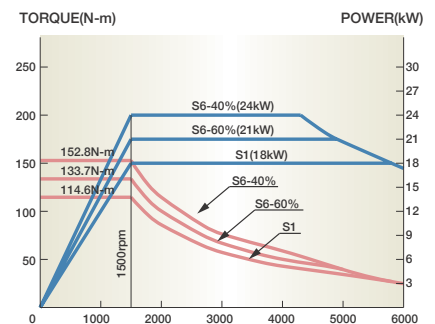
Spindle Speed (rpm)

3. #50, 6,000rpm Gear Head FANUC α 18i (22kW) Spindle Motor



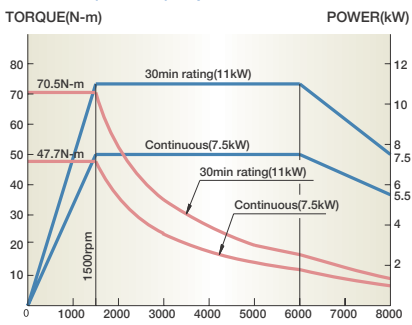
Spindle Speed (rpm)

5. HEIDENHAIN Spindle Motor (8,000rpm)



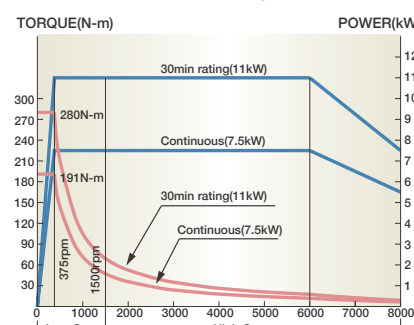
Spindle Speed (rpm)

2. #40, 8,000rpm Spindle FANUC α 8i (11kW) Spindle Motor



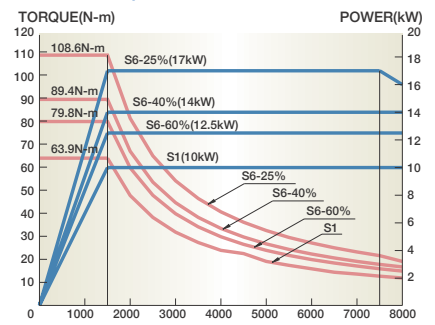
Spindle Speed (rpm)

4. #40, 8,000rpm Spindle ZF gear Box, FANUC α 8i Spindle Motor



Spindle Speed (rpm)

6. 8,000rpm HEIDENHAIN QAN-200U Spindle Motor #40

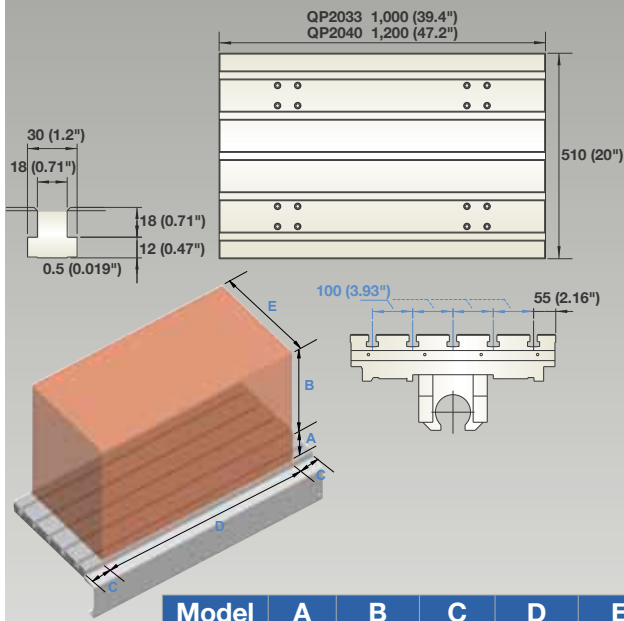


Spindle Speed (rpm)

TABLE AND DIMENSIONS

TOOL SHANK AND PULL STUD

QP2033 / QP2040



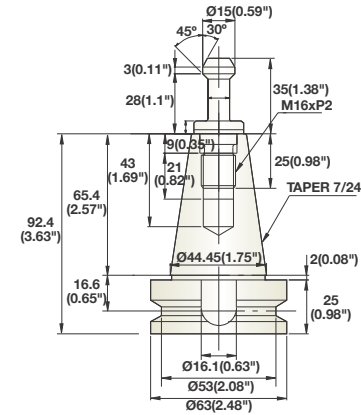
Model	A	B	C	D	E
QP2033	130 (5.1")	510 (20.1")	75 (3")	850 (33.5")	510 (20.1")
QP2040		510 (20.1")	90 (3.5")	1,020 (40.1")	

QP2443

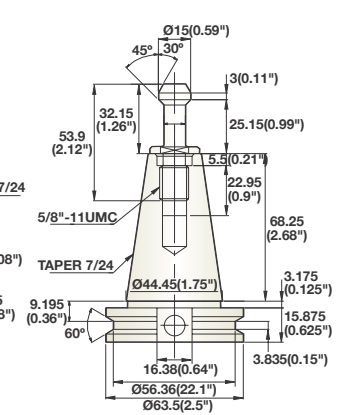


UNIT : mm (")

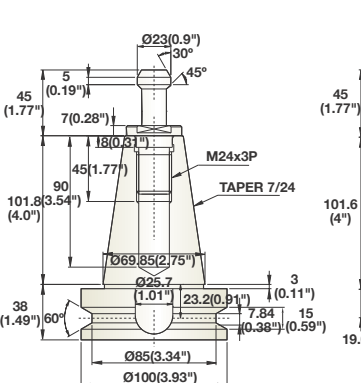
BT-40 (QP2033 / 2040 / 2443)



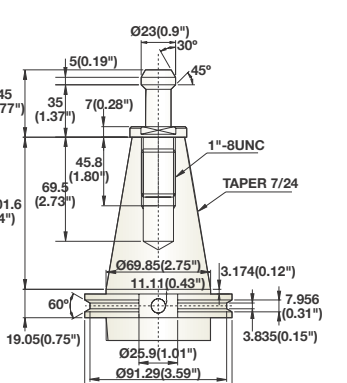
CT-40 (QP2033 / 2040 / 2443)



BT-50 (Only QP2443)



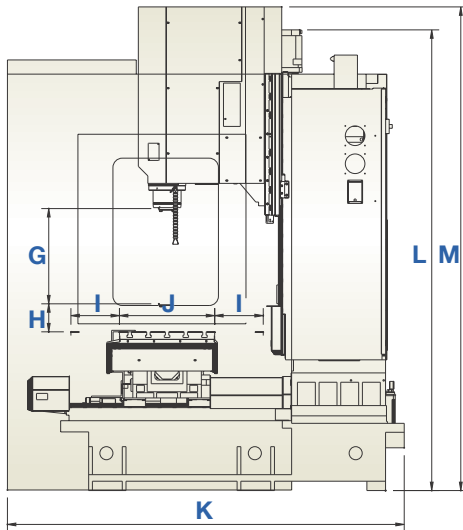
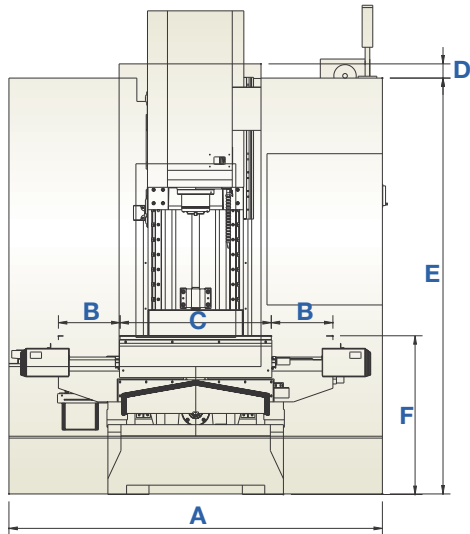
CT-50 (Only QP2443)



EXAMPLE

Workpieces	Mouse-Shell	Pneumatic-Tool Mold	Detergent Container
QP2033 QP2040 QP2443			
Material	SKD-11	NAK-80	SKD-11
Hardness	HRC-52	HRC-40	HRC-52
Dimension	130 x 90 x 40 mm	200 x 200 x 150 mm	130 x 90 x 40 mm
Workpieces	Lantern Mold	Wheel	
QP2033 QP2040 QP2443			
Material	NAK-80	NAK-80	
Hardness	HRC-4	HRC-40	
Dimension	125 x 125 x 60 mm	350 x 350 x 120 mm	

DIMENSIONAL DRAWINGS

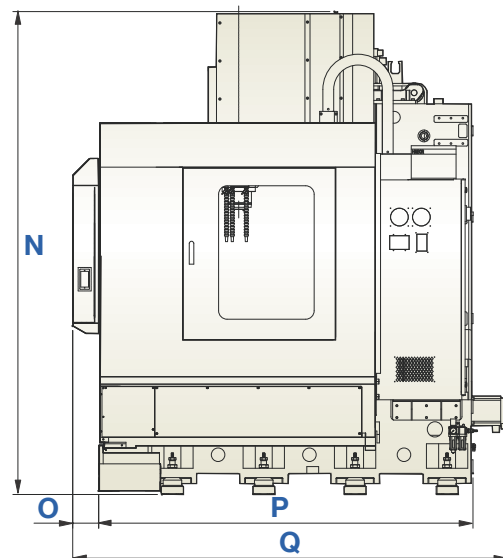
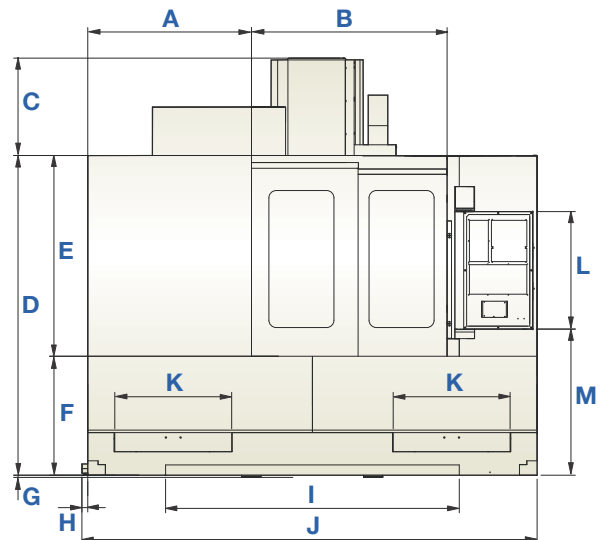


ITEM	QP2443 (#40 / #50)
A	1,115mm (43.9")
B	1,332mm (52.4")
C	663mm (26.1")
D	2,177mm (85.7")
E	1,367mm (53.8")
F	810mm (31.9")
G	15mm (0.6")
H	40mm (1.6")
I	2,000mm (78.7")
J	3,060mm (120.5")
K	769mm (30.2")
L	800mm (31.5")
M	995mm (39.2")
N	2,855mm (112.4")
O	153.5mm (6")
P	2213mm (87.1")
Q	2,458mm (96.8")

All content is for reference only and may be subject to change without notice or obligation.

ITEM	QP2033	QP2040
A	2,430mm (95.7")	2,800mm (110.2")
B	425mm (16.7")	510mm (20.1")
C	1,000mm (39.4")	1,200mm (47.2")
D	76mm (3")	
E	2,227mm (87.7")	2,227mm (87.7")
F	850mm (33.5")	
G	510mm (20.1")	
H	150mm (5.9")	150mm (5.9")
I	265mm (10.4")	
J	510mm (20.1")	
K	2,115mm (83.3")	
L	2,467mm (97.1")	
M	2,598mm (102.3")	

All content is for reference only and may be subject to change without notice or obligation.



SPECIFICATIONS

DESCRIPTION			QP2033	QP2040	QP2443		
Capacity	Max. workpiece weight	kg (lbs.)	500 (1,100)	600 (1,320)	1,000 (2,200)		
	Machining capacity (L x W x H)	mm (")	850 x 530 x 640 (33.5 x 20.9 x 25.2)	1,020 x 530 x 640 (40.2 x 20.9 x 25.2)	1,100 x 610 x 760 (43.3 x 24 x 29.9)		
	Height from the table to ground	mm (")	850(33.5)		850 (33.5)		
Table	Table size	mm (")	1,000 x 510 (39.4 x 20.1)	1,200 x 510 (47.2 x 20.1)	1,250 x 650 (49.2 x 25.6)		
	T-slots (W x D x No.)	mm (")	18 x 100 x 5 (0.7 x 3.9 x 5)		18 x 125 x 5 (0.7 x 4.9 x 5)		
Stroke	X-axis stroke	mm (")	850 (33.5)	1,020 (40.2)	1,100 (43.3)		
	Y-axis stroke	mm (")	530 (20.9)		610 (24)		
	Z-axis stroke	mm (")	510 (20.1)		635 (25)		
Spindle	Spindle speed	rpm	100~10,000 Belt Driven (Optional 8,000 / 12,000) Optional 12,000 / 15,000 Directly Coupled		8,000 Belt Driven (Optional 10K / 12K)	6,000 Belt Driven (Optional 8,000)	6,000 Gear Driven
	Tool shank		#40		#40	#50	#50
	Spindle nose to table surface	mm (")	130~640 (5.1~25.2)		125~760 (4.9~29.9)		
Feed rates	X-axis rapid traverse	m/min (ipm)	24 (945)		20 (787)		
	Y-axis rapid traverse	m/min (ipm)	24 (945)		20 (787)		
	Z-axis rapid traverse	m/min (ipm)	20 (787)		18 (709)	15 (591)	
	Cutting feed (X / Y / Z)	m/min (fpm)	1~10 (40~394)		1~7 (40~276)		
	X / Y / Z axes ball screw diameter	mm (")	Ø40 (Ø1.6)		Ø40 (Ø1.6)		Ø45 (Ø1.8)
Automatic tool changer	Tool shank		BT40 / CT40 / DIN40		BT40 / CT40 / DIN40	BT50 / CT50 / DIN50	
	Pull stud		P40T-1		P40T-1	P50T-1	
	Tool storage capacity		24+1 (Optional 32)		24+1 (Optional 32)		
	Max. tool dia. with adjacent tool	mm (")	80 (3.1)		80 (3.1)	105 (4.1)	
	Max. tool dia. without adjacent tool	mm (")	150 (5.9)		130 (5.1)	200 (7.9)	
	Max. tool length	mm (")	300 (11.8)		300 (11.8)	300 (11.8)	
	Max. tool weight	kg (lbs.)	7 (15.4)		7 (15.4)	15 (33)	
	Tool selection system		Random tool selection mode		Random tool selection mode		
	Tool change time (tool-to-tool)	sec.	1.8		1.8	5	
	Tool change time (chip-to chip)	sec.	5.0		5.0	8	
Motors	Spindle motor (con./30min)	kW	11 / 15 (β 12i) \ (Optional) 7.5 / 11 (α 8i)		7.5 / 11 (α 8i)	11 / 15 (α 22ip)	18.5 / 22 (α 18i)
	Axis motors (X / Y / Z)	kW	1.8 / 1.8 / 2.5 (Optional 3 / 3 / 4)		3 / 3 / 4	4 / 4 / 4	
Power requirement	Power required	KVA	20		25	35	
	Compressed air supply	Pressure	kg/cm ²		5.5		
		Flow	NL/min		200		
Machine dimensions	Machine height (H)	mm (")	2,600 (102.4)		2,633 (103.7)		
	Required floor space (W x L)	mm (")	2,430 x 2,115 (95.7 x 83.3)	2,800 x 2,115 (110.2 x 83.3)	3,060 x 2,458 (120.5 x 96.8)		
	Machine weight	kg (lbs.)	5,300 (11,660)	6,200 (13,640)	7,600 (16,720)	7,900 (17,380)	8,200 (18,040)
Accuracy	Positioning accuracy (X / Y / Z)	mm (")	0.010 / 0.010 / 0.010 (0.0004 x 0.0004 x 0.0004)		0.015 / 0.012 / 0.012 (0.0006 x 0.0005 x 0.0005)		
	Repeatability accuracy (X / Y / Z)	mm (")	0.007 / 0.007 / 0.007 (0.0003 x 0.0003 x 0.0003)		0.012 / 0.008 / 0.008 (0.0005 x 0.0003 x 0.0003)		
	Accuracy standard		ISO 230-2 / VDI 3441				

All content is for reference only and may be subject to change without notice or obligation.

INSPECTION



Laser Calibration

After assembling, all machines are measured and calibrated by state-of-the-art laser calibration equipments. This ensures precise verification and compensation of the machines, resulting in increased accuracy and repeatability.



Ball Bar Testing

The machine is put through a series of circular moves in the X / Y plane, and 1/2 circle moves in the X / Z and Y / Z planes. Encoder data from the bar is fed into a computer, which outputs a chart of machine accuracy. Any deviations in squareness or length show up as distorted circles that are very easy for a technician to spot. This chart assures that the machine be accurate and properly aligned.

Standard / Optional Accessories

	QP2033	QP2040	QP2443		QP2033	QP2040	QP2443
FANUC 0iMD 8.4 TFT	●	●	●	Tool box with tools	●	●	●
FANUC 31iM controller 10.4" TFT	○	○	○	Operation manual in CD	●	●	●
SIEMENS controller 828D	○	○	○	Rigid tapping	●	●	●
HEIDENHAIN controller iTNC530	○	○	○	RS232 / USB interface	●	●	●
24 Tool ATC	●	●	●	Air gun	○	○	○
32-station chain type tool magazine	○	○	○	Heat exchanger for electric cabinet	○	○	○
Air purge curtain	●	●	●	Oil skimmer	○	○	○
Spindle air blast	●	●	●	BT-40, CT-40 or DIN-40 pull studs	○	○	○
Air blast chip blower	●	●	●	BT-50, CT-50 or DIN-50 pull studs	NA	NA	○
Chip conveyor on X- axis	○	○	○	Spindle / gear head oil chiller	○	○	○(40#) ●(50#)
Screw type chip conveyor on Y-axis	○	○	○	Through spindle coolant system (20Bar~70Bar)	○	○	○
Rear chip flush system	●	●	●	Linear scale	○	○	○
Work light	●	●	●	4th axis preparation	○	○	○
Pilot light	●	●	●	4th axis CNC rotary table	○	○	○
Fully enclosed splash guard	●	●	●	Auto tool length measurement system	○	○	○
Water tank	●	●	●	Auto workpiece measurement system	○	○	○
Auto lubrication system	●	●	●	Automatic power off	○	○	○
MPG handle wheel	●	●	●	Water gun	○	○	○
Leveling bolts and pads	●	●	●	ZF Gear Box	NA	NA	○(40#)NA ○(50#)
Bolt kit with tools for foundation	●	●	●				

● Standard Accessories ○ Optional Accessories



Grinding Machine



Grinding Machine



Turning Machine



Milling Machine

Headquarters

FALCON MACHINE TOOLS CO., LTD.

No. 34, Hsing Kong Road, Shang Kang, Chang Hua TAIWAN 50971

Tel: +886 4 799-1126 Fax: +886 4 798-0011

www.chevalier.com.tw

overseas@chevalier.com.tw

TA-YA Factory Tel: +886 4 2567-3266

U.S.A. Headquarters

CHEVALIER MACHINERY INC.

9925 Tabor Place, Santa Fe Springs, CA 90670 U.S.A.

Tel: (562) 903-1929 Fax: (562) 903-3959

www.chevalierusa.com

info@chevalierusa.com



All content is for reference only and may be subject to change without prior notice or obligation.