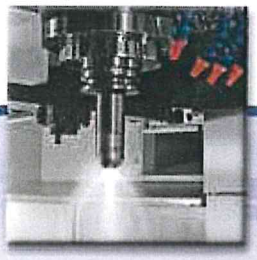
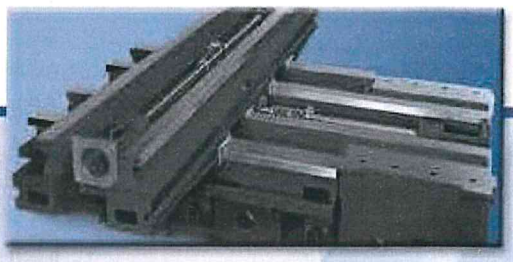
CHEVALIER®

Grinding / Turning / Milling





QP Box Way Series

Vertical Machining Center

QP2033 · 2040 · 2443

QP Series

Heavy-Duty Vertical Milling Center with High-Precision Performance

The QP series vertical machining centers are designed for high precision and high productivity machining of large parts for aerospace, energy, automotive industries or job shops.

The series includes four box ways on Y-axis, which ensures optimum rigidity and reduces overhang of table. The 50 taper, 30 HP with Chevalier 2-speed gear headstock generate over 450 ft.-lbs. torque. It would satisfy most cutting condition for tough material application. The high quality cast iron construction with ribbed frame and wide stance machine base provide excellent support and damping character. The box way surfaces are coated with Turcite-B and hand-scraped for smooth movement. In X/Y/Z axes, the pre-tensioned Class 3 ballscrews reduce thermal deflation. The ballscrews and servo motors are connected by flexible couplings, which ensure high transmission efficiency and minimum backlash.

The special design of the floating-type tool release system provides a tool change without extra pressure on the bearings and absorbs the unclamping force generated during each tool release. This design helps prolong bearing life, maintain accuracy and increases speed.

Included in the series is a powerful FANUC 0i-M control that delivers rigid taping and AICC high-speed machining mode with a 40-block look-ahead. A front-loading PCMCIA port is standard for a memory card.

QP2033 • 2040 • 2443 Series

Table Size: Up to 1,250W x 650Lmm (49.2" x 25.6")

Table Load: Up to 1,000Kg (2,200 lbs.)

XYZ Travel: Up to 1,100(X) x 610(Y) x 635(Z) mm
(43.3" x 24" x 25")

Spindle Speed: Up to 8,000rpm

Spindle Motor: Up to 22kW (35HP)

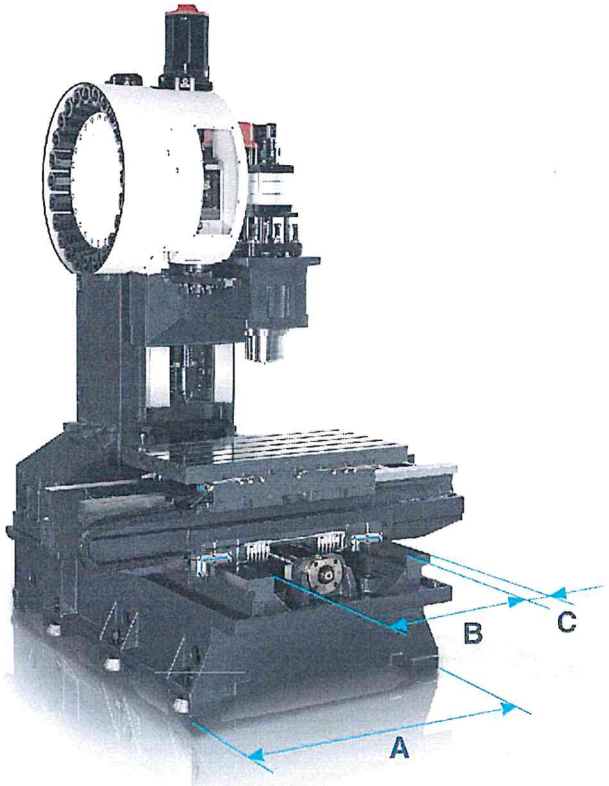
Spindle Taper: BT/CT/DIN 40 or 50


CHEVALIER
QP-2040
CHEVALIER

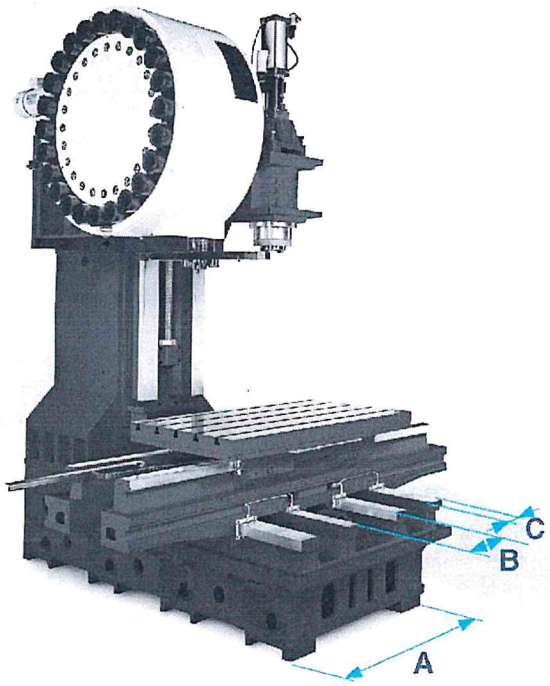

CHEVALIER
QP-2443
CHEVALIER

QP2033 · 2040 · 2443 Series

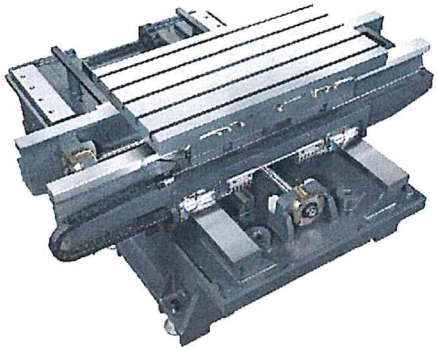
Machine Structure



	A	B	C
QP2033 QP2040	1100 (40.6")	580 (22.8")	110 (4.3)

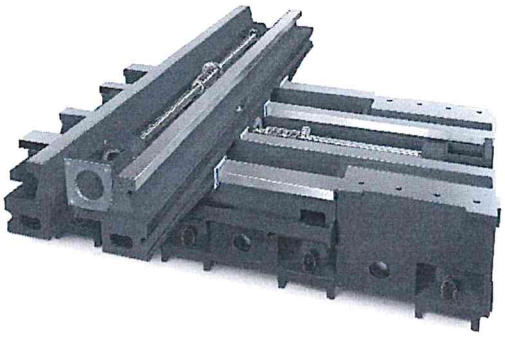


	A	B	C
QP2443	1100 (40.6")	270 (10.6")	100 (3.9")



QP2033 and 2040 High Accuracy and Stability

- Machining centers features X/Y/Z box ways that are hardened and precision grounded.
- Box way surfaces are coated with Turcite-B and hand scraped for smooth movement.
- Y-axis heavy-duty saddle guide way design bears the weight evenly to eliminate overhang and slide deformation.

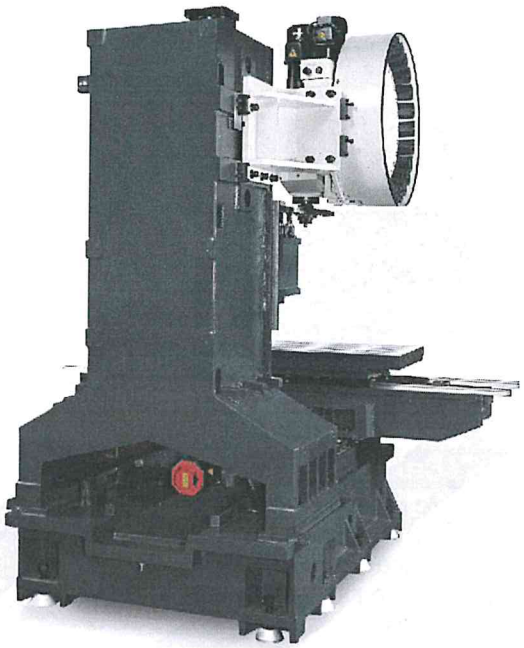


QP2443 High Precision Double-Nut Ballscrews and Guide Ways

- Three 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 • 2040 • 2443 Series

Machine Structure

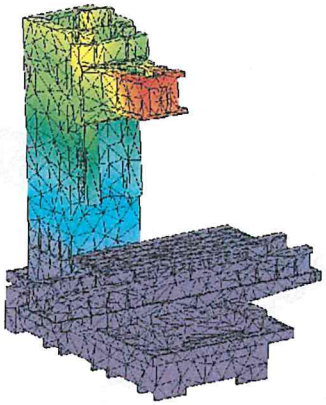


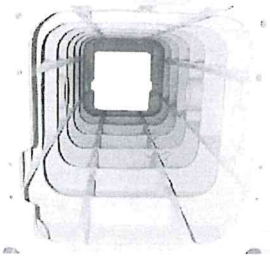
Rigid "Y" Span Column Construction

The column is designed with an inverted "Y" shape construction for outstanding stability and rigidity. The heavy-duty column design supports the headstock for increased accuracy cutting. The oversized column footprint provides maximum support for both the standard belt driven spindle or the optional higher torque spindle with two-speed gearbox.

Reinforced Base and Column Casting

The base and column castings feature vibration-absorbing ribs that transfer vibration away from the cutting area. The columns feature superior rigidity and provides a superior anti-flex structure.



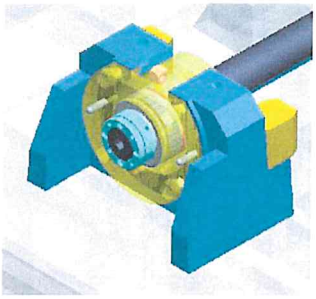


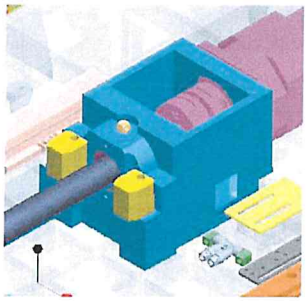
3D Integrated Design

The geometric model of the machine was created by using 3D computer software to avoid blind spots. The structure analysis were carried out with the help of the ProE/MECHANICA (FEM) software to ensure superior stability and rigidity.

Hand Scraping

- The box way surfaces are coated with Turcite-B and hand scraped for smooth movement.
- Promotes ideal flatness on mated surfaces for tight tolerances.





Solid Bearing Seat on All Series

Solid bearing seats are integrated into the machine casting to ensure precision, accuracy and decreases vibration.

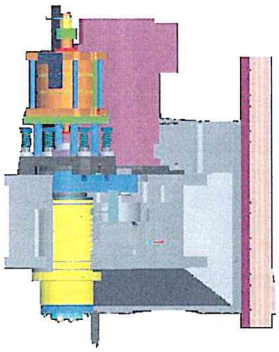
Big Span Column Seat Design

- Solid bearing seats are integrated into the machine casting.
- Direct coupling motor and ballscrew
- Thrust of each axis of each model:

Model	X axis	Y axis	Z axis
QP2033	6548 N	6548 N	11927 N
QP2040	6548 N	6548 N	11927 N
QP2443	13097 N	13097 N	13097 N

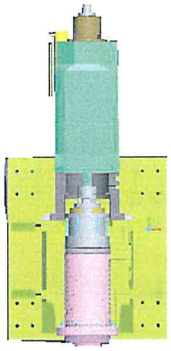
QP2033 • 2040 • 2443 Series

Spindle System



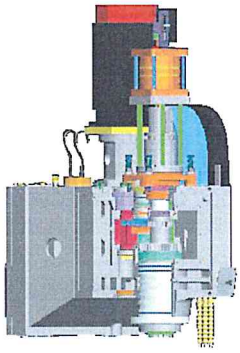
Belt Drive

- The spindle is supported by Class 7 (P4) angular contact ball bearings in the front and two Class 7 (P4) angular contact ball bearings in the back.
- Enforced timing belts are used for transmission, which results in high efficiency, less vibration, slip-free movement, and easy maintenance.



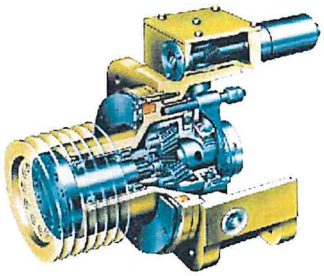
Direct Drive

- Direct drive spindle features 20 HP, two winding and high torque FANUC digital spindle motor.
- Produces high torque machining capability in low-speed and better finish surface in high-speed.
- Spindle uses a direct coupling with the motor for less vibration, noise, and less thermal expansion satisfying most cutting application conditions.



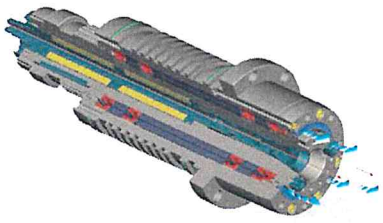
Gear Drive

- 40 taper gear drive spindle features 20 HP, 40 taper, high torque FANUC digital spindle motor with 2-speed gearbox spindle producing over 280N-m of high torque in lower rpm.
- Spindle satisfies most cutting condition for tough material applications (QP2033, QP2040).
- 50 taper gear drive spindle features 30 HP, high torque FANUC digital spindle motor with Chevalier's 2-speed gear headstock that generates over 450 ft.-lbs. of torque.
- Satisfies most cutting conditions for tough material applications (QP2443).



Optional ZF Gearbox (QP2033 & QP2040)

- Provides high torque in low spindle speeds for heavy-duty cutting, drilling and tapping.
- Max. 8,000rpm (for #40 spindle).



Spindle Air-Purge

- Reduces error motion and are thermally stable up to 10,000rpm.
- For high-speed, very demanding machining on rugged applications.
- Positive airflow pressure to expel debris and protect the spindle from contaminants.

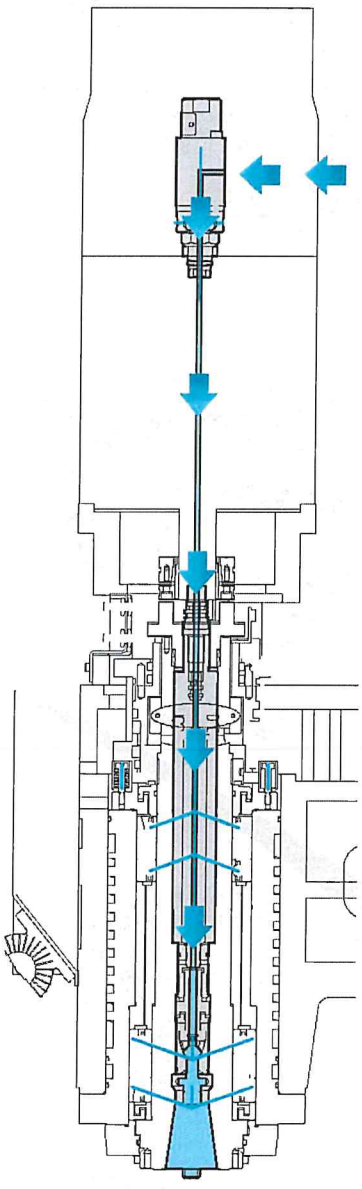
BIG-PLUS® Spindle System

- #40 Big-Plus spindle.
- Dual contact between spindle face and flange.
- Increase tool rigidity, reduce runout and add significant productivity.
- High-speed, high-rigidity and increased cutting power and depth.

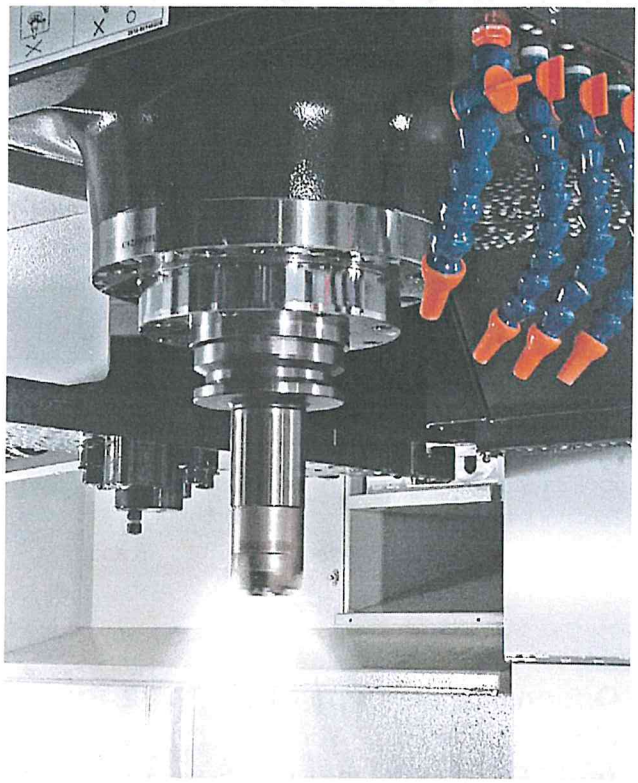
QP2033 • 2040 • 2443 Series

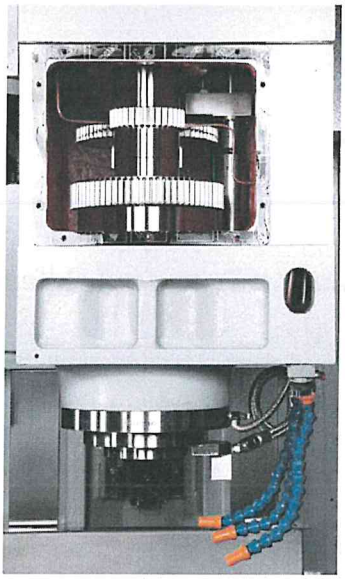
Coolant-Through-Spindle System

Optional 20/70 bar (300/1,000PSI) coolant-through-spindle system provides high pressure coolant which efficiently takes out chips and heat from deep hole drilling. This system greatly enhances the tool cutting performance and longevity as well as parts accuracy.



Coolant-Through-Spindle Is Applied Directly to the Cutting Edge





50 Taper Gear Spindle (Optional for QP2443)

The gear-type spindle is supported by Class 7 (P4) NN-type cylindrical roller bearings in front and Class 7 (P4) angular contact thrust ball bearings with inner diameter of Ø90mm (Ø3.54"), which is very stiff and suitable for heavy-duty machining.

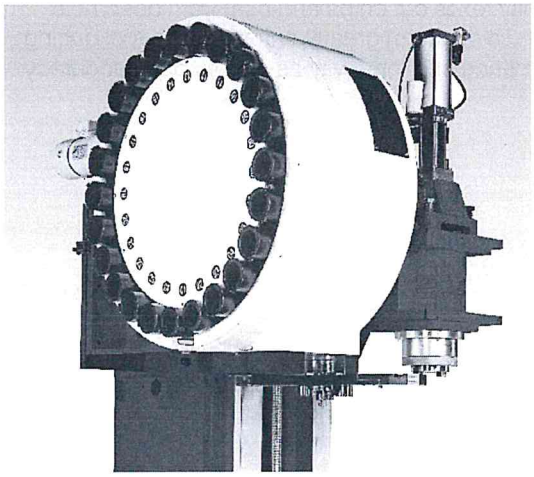
QP2033 • 2040 • 2443 Series

Automatic Tool Changer System

Standard Drum-Type ATC with 24 Tool Magazine

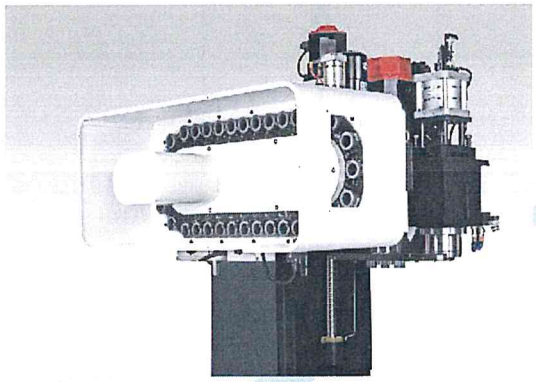
The tool shank is #40 (opt. #50) with tool capacity of 24. The maximum tool diameter without adjacent tool is 150mm (5.9") and tool-to-tool charge time is 1.8 sec. System features a double arm and a random tool selection mode.

ATC System	QP 2033 / 2040	QP 2443
Tool Shank	#40	#40 / #50
Tool Capacity	24 / 32 (opt.)	
Tool Selection	Random	
Tool Access	Bi-Directional	
Tool-Tool	1.8 sec.	5 sec.



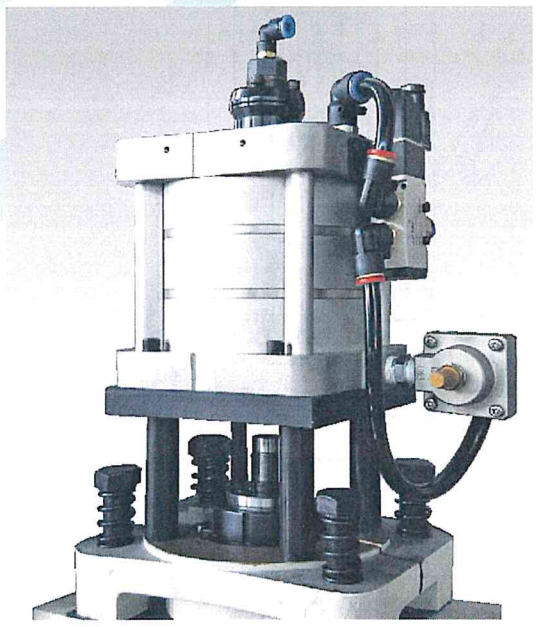
Optional Chain-Type ATC with 32 Tool Magazine

The tool shanks are #40 or #50. Tools capacity is 32 sets features random tool selection mode.



Quick Floating Type Tool Release System

- Big cylinder diameter design works with floating type tool unclamping system, providing quick tool release and protects spindle accuracy and longevity.
- The clamping pressure force of 5,000kg (11,000 lbs.) is supported by the main structure of the spindle, not by the bearing.

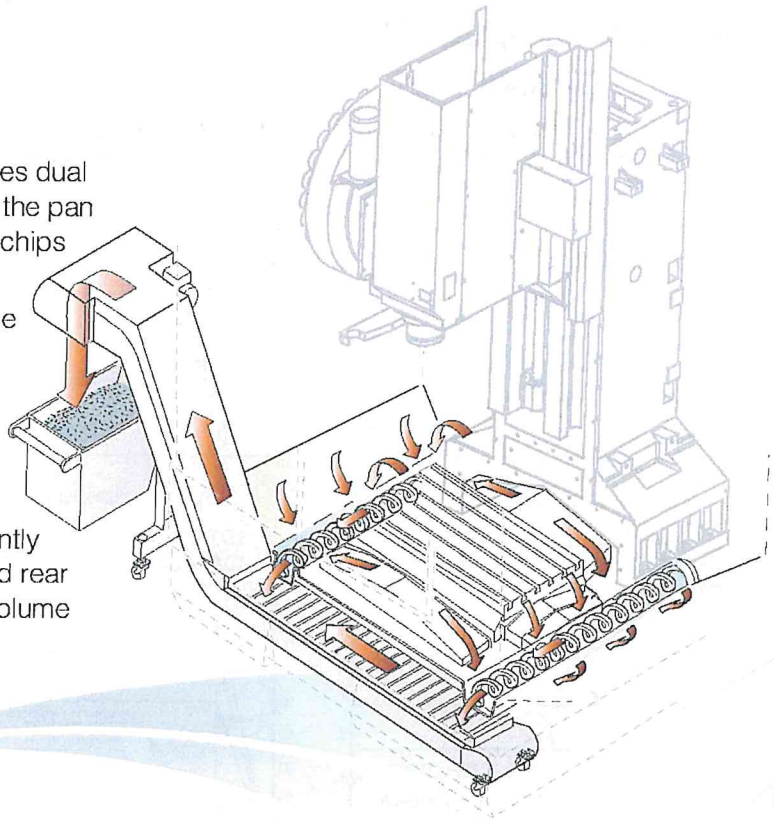


QP2033 • 2040 • 2443 Series

Chip Removal

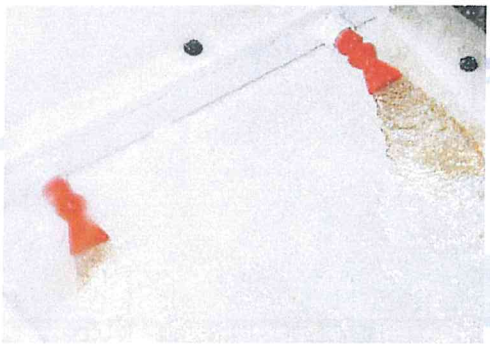
Chip Removal System

- High-volume chip-removal system comprises dual sided augers to move chips to the sides of the pan and a primary chip auger to discharge the chips to the side of machine.
- Lift-up conveyor evacutes materials from the machine.



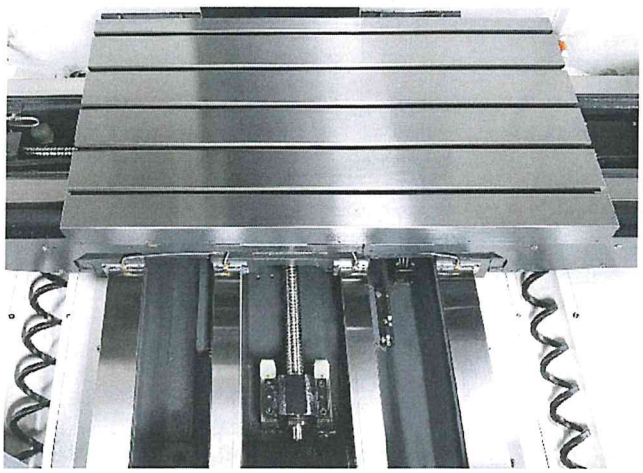
Rear Chip Flushing Device

The powerful rear chip flushing devise efficiently removes hot chips from bottom enclosure and rear side Y-axis telescope cover. The maximum volume is 150L/min.



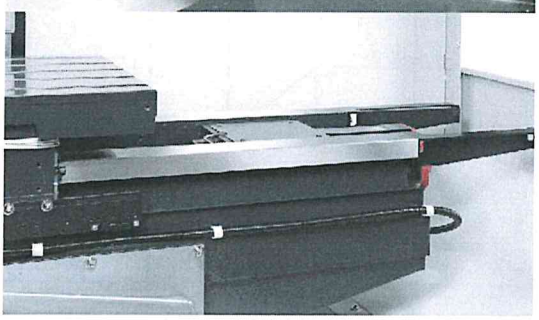
Dual Chip Augers

Automatic chip-flushing system brings cutting chips to center of the machine base. Screw-type chip conveyor (opt.) delivers cutting chips to the chip conveyor (opt.), which is located at the front of the machine base.



Easy Chip Flow Splash Guard Design

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

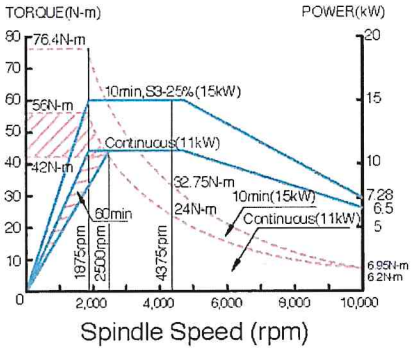


QP2033 • 2040 • 2443 Series

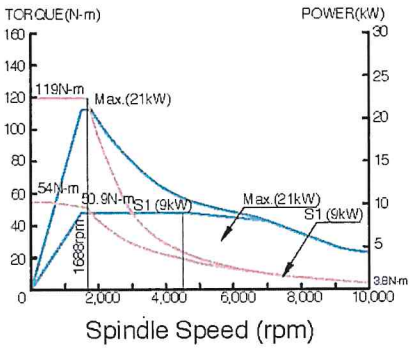
Spindle Torque Chart

QP2033 / QP2040

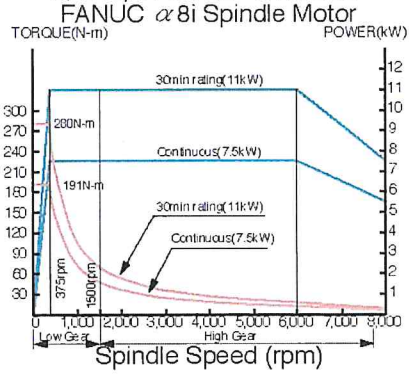
10,000rpm FANUC β 12i Belt Drive Motor



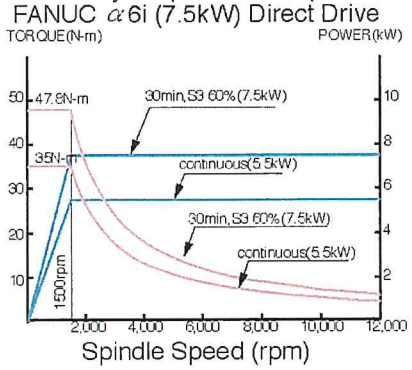
10,000rpm SIEMENS 1PH 8107 Belt Drive Motor



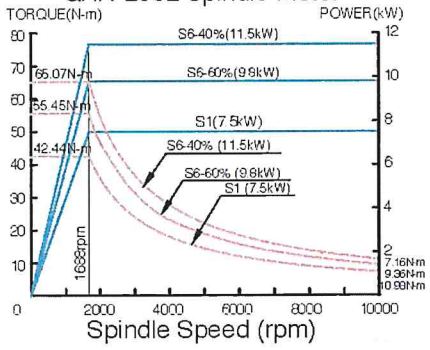
8,000rpm with ZF Gear Box FANUC α 8i Spindle Motor



Directly coupled 12,000rpm FANUC α 6i (7.5kW) Direct Drive

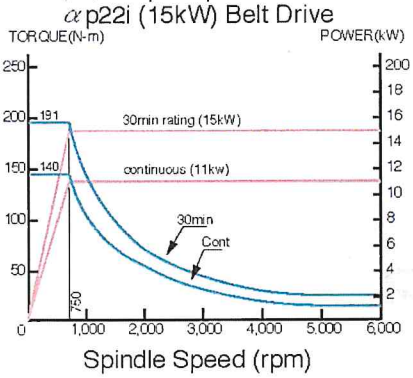


10,000rpm HEIDENHAIN QAN-200L Spindle Motor

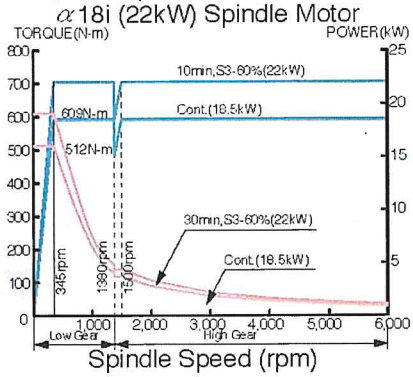


QP2443

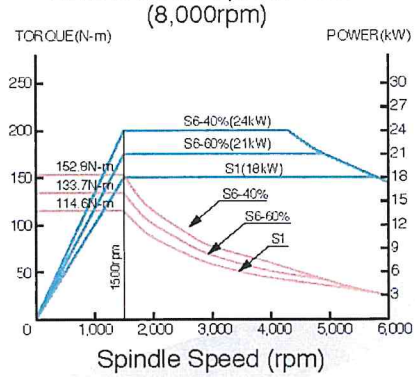
#50, 6,000rpm Spindle FANUC α p22i (15kW) Belt Drive



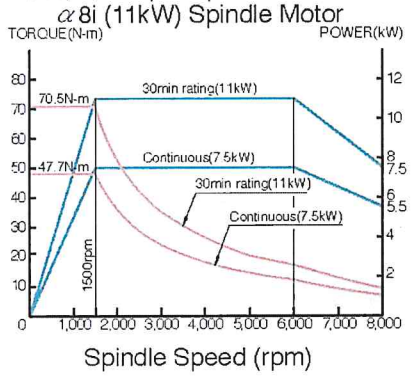
#50, 6,000rpm Gear Head FANUC α 18i (22kW) Spindle Motor



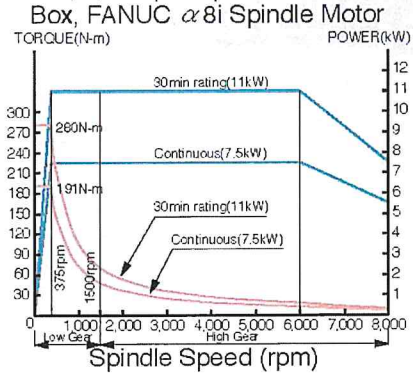
HEIDENHAIN Spindle Motor (8,000rpm)



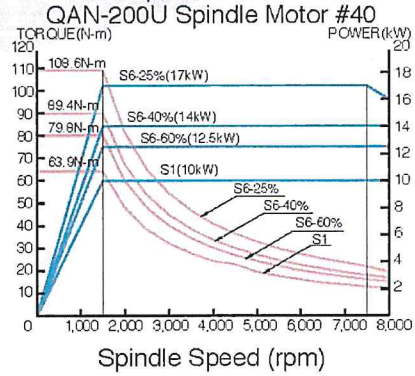
#40, 8,000rpm Spindle FANUC α 8i (11kW) Spindle Motor



#40, 8,000rpm Spindle ZF Gear Box, FANUC α 8i Spindle Motor



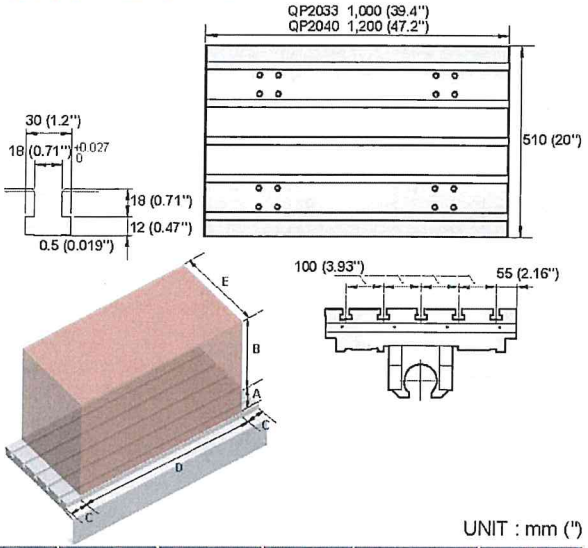
8,000rpm HEIDENHAIN QAN-200U Spindle Motor #40



QP2033 · 2040 · 2443 Series

Table Dimensions

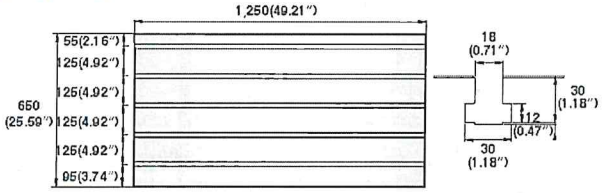
QP2033 / QP2040



UNIT : mm (")

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	125 (4.9")	635(25")	75 (3")	1,100 (43.3")	650 (25.6")

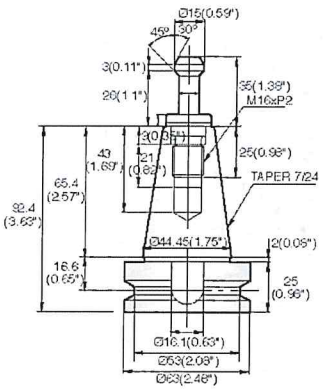
QP2443



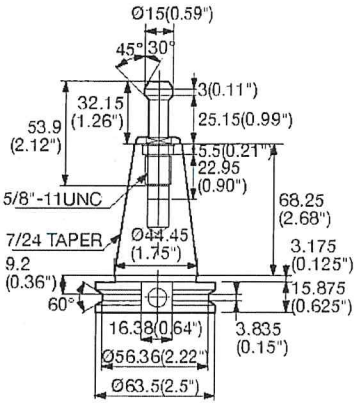
Tool Shank and Pull Stud

UNIT : mm (")

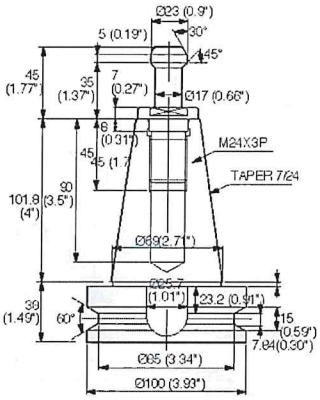
BT-40
(QP2033 / 2040 / 2443)



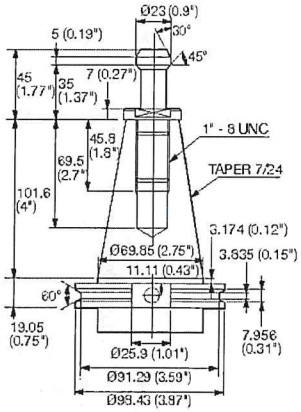
CT-40
(QP2033 / 2040 / 2443)



BT-50
(Only QP2443)

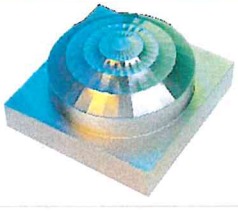
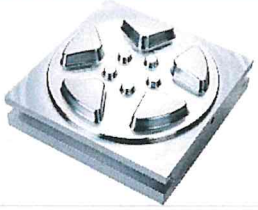


CT-50
(Only QP2443)



Applications

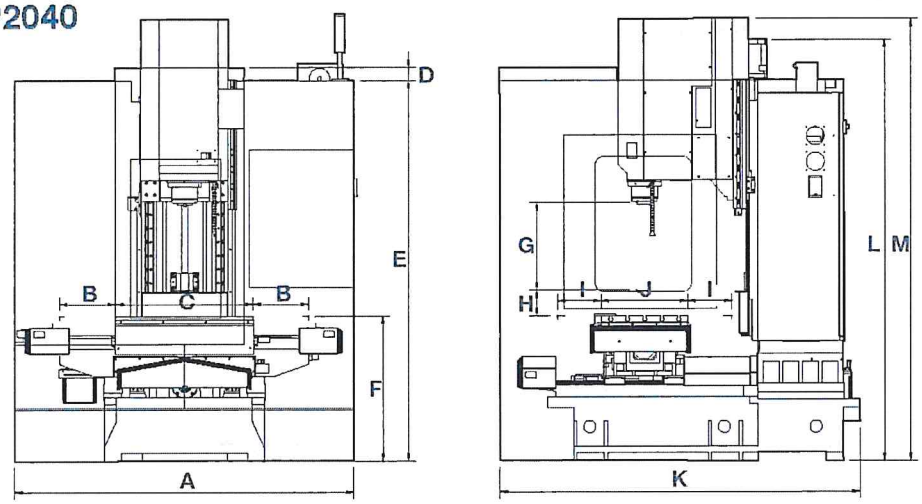
Workpieces	Mouse-Shell	Pneumatic-Tool Mold	Detergent Container
QP2033 QP2040 QP2443			
Material	SKD-11	NAK-80	SKD-11
Hardness	HRC-52	HRC-40	HRC-52
Dimension	130 x 90 x 40 mm	200 x 200 x 150 mm	130 x 90 x 40 mm

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

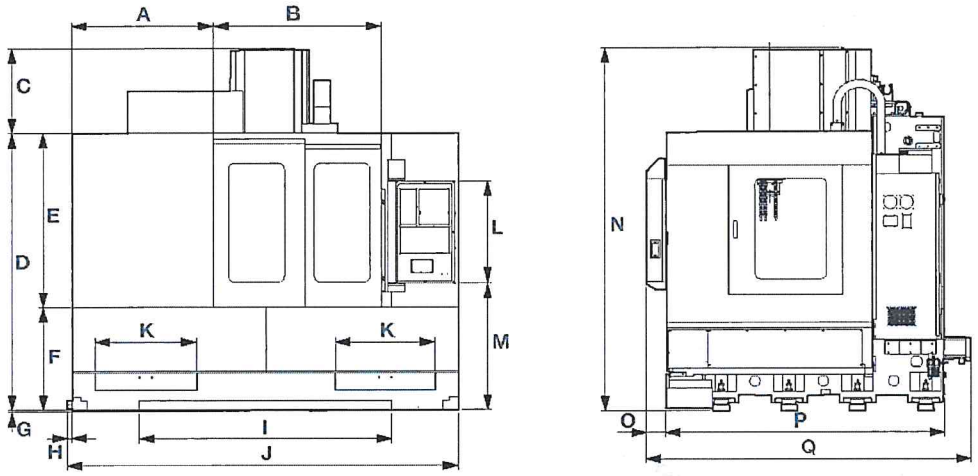
QP2033 • 2040 • 2443 Series

Dimensional Drawings

QP2033 / QP2040



QP2443



UNIT : mm (")

Item	QP2033	QP2040
A	2,430 (95.7")	2,800 (110.2")
B	425 (16.7")	510 (20.1")
C	1,000 (39.4")	1,200 (47.2")
D	76 (3")	
E	2,227 (87.7")	2,227 (87.7")
F	850 (33.5")	
G	510 (20.1")	
H	130 (5.1")	130 (5.1")
I	265 (10.4")	
J	510 (20.1")	
K	2,115 (83.3")	
L	2,467 (97.1")	
M	2,598 (102.3")	

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

QP Series
Control

Standard Control

FANUC 0iM
8.4" TFT LCD color monitor

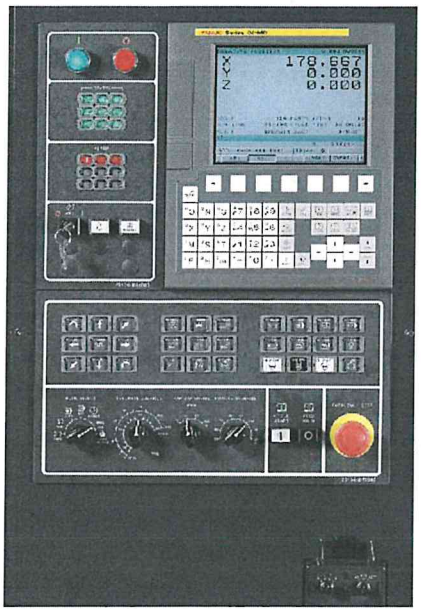
Optional Controls

FANUC 31iM
10.4" TFT LCD color monitor

HEIDENHAIN TNC640 HSCI
15" TFT LCD color monitor

SIEMENS 828D Control
10.4" TFT LCD color monitor and "ShopMill" software

FANUC OiM Control

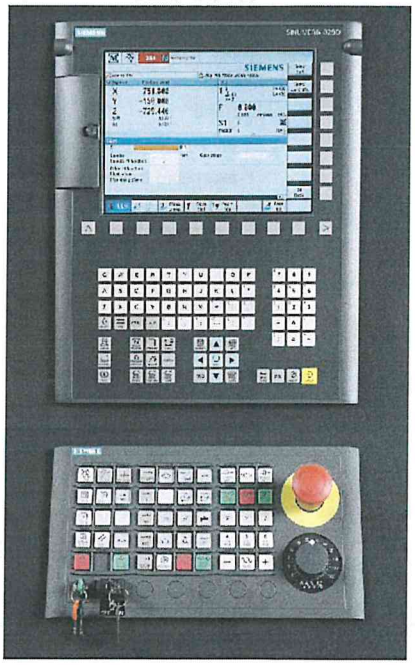


- 4-axes simultaneous control
- Linear interpolation
- Circular interpolation
- Helical interpolation
- Exact stop G09
- Skip function G31
- Automatic acceleration / deceleration
- Plane select G17, G18, G19
- Polar coordinate command G15 / G16
- Workpiece coordinate system G52~G59
- Scaling G50 / G51
- Automatic override for inner corners G62
- Coordinate system rotation G68 / G69
- Rigid tapping M29
- Program data input G10
- Canned cycles for drilling
- Tool function
- Tool length compensation
- Tool offset memory 400 pieces
- Art program storage length: 512K (0iM)
- Number of registerable program: 400 (0iM)
- Background editing
- Manual guide 0i
- 0iM color 8.4" LCD
- USB interface

HEIDENHAIN TNC640 HSCI Control

- Contouring control for machines with up to 18-axes and controlled spindle
- HEIDENHAIN inverter systems and motors recommended
- Uniformly digital with HSCI interface
- TFT color flat-panel display, 15-inch
- Storage medium: SSDR solid state disk with 32 GB
- Programming in HEIDENHAIN conversational format, with according to DIN / ISO
- Standard milling, drilling and boring cycles
- Touch probe cycles
- FK free contour programming
- Special functions for fast 3-D machining
- Short block processing time (0.5ms)
- Automatic calculation of cutting data
- Pallet management

SIEMENS 828D Control



- LCD color
- Linear interpolation
- Circular interpolation
- Helical interpolation
- Skip function
- Plane select
- Workpiece coordinate system
- Coordinate system rotation
- Rigid tapping
- Mirror image, scaling, rotation
- Canned cycles for drilling / milling
- Tool function
- Tool length / radius compensation
- Part program storage length: 3MB
- Background editing

QP2033 · 2040 · 2443 Series

Specifications

Description		QP2033	QP2040	QP2443		
Capacity	Max. workpiece weight	500kg (1,100lbs.)	600kg (1,320lbs.)	1,000kg (2,200lbs)		
	Machining capacity (L x W x H)	850 x 530 x 640mm (33.5" x 20.9" x 25.2")	1,020 x 530 x 640mm (40.2" x 20.9" x 25.2")	1,100 x 610 x 760mm (43.3" x 24" x 29.9")		
	Height from the table to ground	850 (33.5")				
Table	Table size	1,000 x 510mm (39.4" x 20.1")	1,200 x 510mm (47.2" x 20.1")	1,250 x 650mm (49.2" x 25.6")		
	T-slots (W x D x No.)	18mm x 100mm x 5 (0.7" x 3.9" x 5)		18mm x 125mm x 5 (0.7" x 4.9" x 5)		
Stroke	X-axis stroke	850mm (33.5")	1,020mm (40.2")	1,100mm (43.3")		
	Y-axis stroke	530mm (20.9")		610mm (24")		
	Z-axis stroke	510mm (20.1")		635mm (25")		
Spindle	Spindle speed	100~10,000rpm Belt Drive (Opt. 8,000/12,000rpm) Opt. 12,000/15,000rpm Direct Drive		8,000rpm Belt Drive (Opt. 10K/12Krpm)	6,000rpm Belt Drive (Opt. 8,000rpm)	6,000rpm Gear Drive
	Tool shank	#40		#40	#50	
	Spindle nose to table surface	130~640mm (5.1"~25.2")		125~760mm (4.9"~29.9")		
Feed rates	X-axis rapid traverse	25m/min (82ipm)		20m/min (65.6ipm)		
	Y-axis rapid traverse	25m/min (82ipm)		20m/min (65.6ipm)		
	Z-axis rapid traverse	20m/min (65.6ipm)		18m/min (59.1ipm)	15m/min (49.2ipm)	
	Cutting feed (X / Y / Z)	1~10m/min (3.3~32.8fpm)		1~7m/min (3.3~23fpm)		
	X / Y / Z axes ball screw diameter	Ø40mm (Ø1.6")		Ø40mm (Ø1.6")	Ø45mm (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	24T (Opt. 32T)				
	Max. tool dia. with adjacent tool	80mm (3.1")		80mm (3.1")	105mm (4.1")	
	Max. tool dia. without adjacent tool	150mm (5.9")		130mm (5.1")	200mm (7.9")	
	Max. tool length	300mm (11.8")				
	Max. tool weight	7kg (15.4lbs.)		7kg (15.4lbs.)	15kg (33lbs.)	
	Tool selection system	Random tool selection mode				
	Tool change time (tool-to-tool)	1.8 sec.		1.8 sec.	5 sec.	
	Tool change time (chip-to chip)	4.85 sec.		4.85 sec.	8 sec.	
Motors	Spindle motor (con./30min)	11/15kW (β12i), Opt.7.5/11kW(α8i)		7.5/11kW (α8i)	11/15kW (α22i)	18.5/22kW (α18i)
	Axis motors (X / Y / Z)	1.8 / 1.8 / 2.5 kW, Opt. 3 / 3 / 4 kW		3 / 3 / 4 kW	4 / 4 / 4 kW	
Air & power requirements	Power required	20 kVA		25 kVA	35 kVA	
	Compressed air supply Pressure	5 kg/cm^2		5.5 kg/cm^2		
	Compressed air supply Flow	200 NL/min				
Machine dimensions	Machine height (H)	2,600mm (102.4")		2,633mm (103.7")		
	Required floor space (W x L)	2,430 x 2,115mm (95.7" x 83.3")	2,800 x 2,115mm (110.2" x 83.3")	3,060 x 2,458mm (120.5" x 96.8")		
	Machine weight	5,300kg (11,660lbs.)	6,200kg (13,640lbs.)	7,600kg (16,720lbs.)	7,900kg (17,380lbs.)	8,200kg (18,040lbs.)
Accuracy	Positioning accuracy (X / Y / Z)	0.010 / 0.010 / 0.010mm (0.0004" / 0.0004" / 0.0004")		0.015 / 0.012 / 0.012mm (0.0006" / 0.0005" / 0.0005")		
	Repeatability accuracy (X / Y / Z)	0.007 / 0.007 / 0.007mm (0.0003" / 0.0003" / 0.0003")		0.012 / 0.008 / 0.008mm (0.0005" / 0.0003" / 0.0003")		
	Accuracy standard	ISO 230-2 / VDI 3441				

QP2033 • 2040 • 2443 Series

Standard / Optional Accessories

● Accessories ◎ Optional Accessories

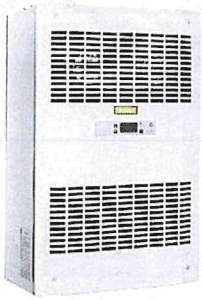
	QP2033	QP2040	QP2443
FANUC 0iM 8.4" TFT	●	●	●
FANUC 31iM Controller 10.4" TFT	◎	◎	◎
SIEMENS Controller 828D	◎	◎	◎
HEIDENHAIN Controller TNC640	◎	◎	◎
24 Tool ATC	●	●	●
32-Station Chain Type Tool Magazine	◎	◎	◎
Air Purge Curtain	●	●	●
Spindle Air Blast	●	●	●
Air Blast Chip Blower	●	●	●
Lift-Up Chip Conveyor	◎	◎	◎
Screw Type Chip Auger	◎	◎	◎
Rear Chip Flush System	●	●	●
Work Light	●	●	●
Pilot Light	●	●	●
Fully Enclosed Splash Guard	●	●	●
Coolant Tank	●	●	●
Auto Lubrication System w/ Pressure Detection	●	●	●
Remote MPG Hand Wheel	●	●	●
Leveling Bolts and Pads	●	●	●
Tool Box with Tools	●	●	●

	QP2033	QP2040	QP2443
Operation Manual in CD	●	●	●
Air Gun	◎	◎	◎
Heat Exchanger for Electric Cabinet	◎	◎	◎
Oil skimmer *	◎	◎	◎
BT-40, CT-40 or DIN-40 Pull Studs	◎	◎	◎
BT-50, CT-50 or DIN-50 Pull Studs	N/A	N/A	◎
Spindle / Gear Head Oil Chiller	◎	◎	◎(40#) ●(50#)
Through-Spindle Coolant System (20/70Bar-300/1,000PSI)	◎	◎	◎
Linear Scale	◎	◎	◎
4th Axis Preparation *	◎	◎	◎
4th Axis CNC Rotary Table	◎	◎	◎
Auto Tool Length Measurement System	◎	◎	◎
Auto Workpiece Measurement System	◎	◎	◎
Automatic Power Off	◎	◎	◎
Water Gun	◎	◎	◎
ZF Gear Box	N/A	N/A	◎(40#)N/A ◎(50#)

* Standard in the US only.

Spindle Oil Chiller

- A highly efficient oil chiller is installed in the spindle to control the temperature and reduce the thermal deformation.
- A forced circulation cooling system is applied to bearings and gears in the gearbox. This outstanding cooling system reduces thermal strain to a minimum and upgrades machining accuracy.



Air Conditioner for Electric Cabinet (Opt.)

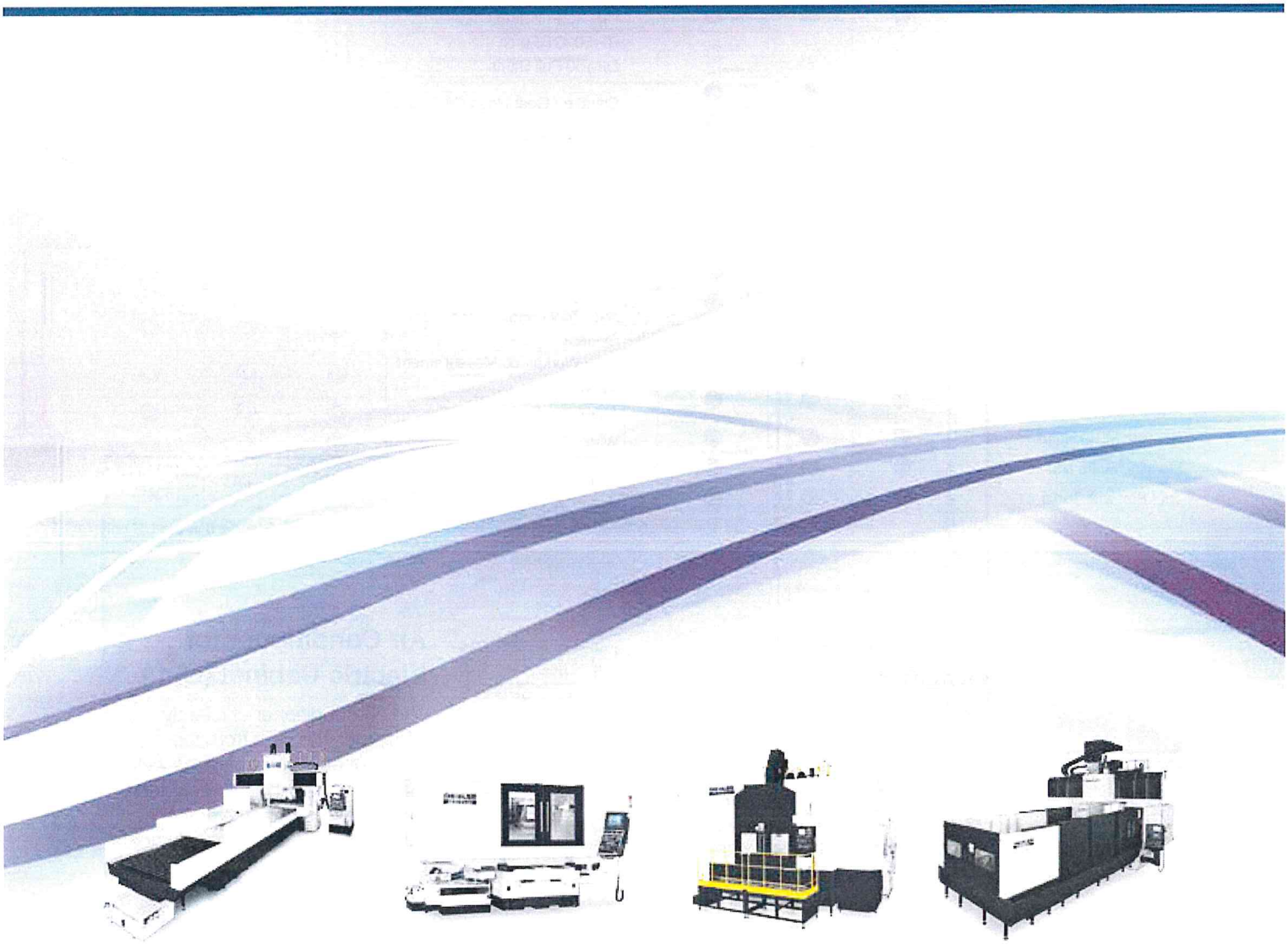
The air conditioner efficiently eliminates the heat from the inside of electric cabinet as well as keeps the cabinet clean and dry, which can ensure stable and reliable performance of electrical components and facilitate smooth machine operation.

Tool Measurement System (Opt.)

The tool measurement system is provided for fast tool setting. In order to achieve the greatest machining accuracy, measuring tools is a crucial part of machining procedure.

Workpiece Measurement System (Opt.)

The workpiece measurement system can precisely detect workpiece position and provide correct workpiece orientation. Moreover, the system can be applied for thermal compensation and performs contour measurement.



Grinding Machine | Grinding Machine | Turning Machine | Milling Machine

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