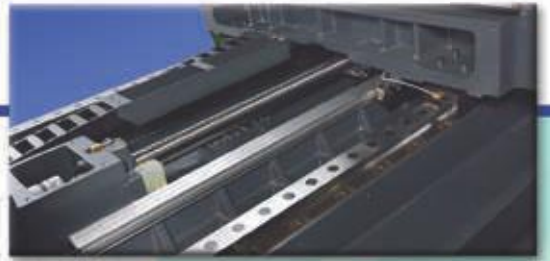


CHEVALIER®

Grinding / Turning / Milling



QP5X-400

5-Axis Vertical Machining Center

QP5X-400

5-Axis Machining Center With 2-axis Rotary Table Engineered for Machining Complex-shaped Workpieces

Chevalier's NEW QP5X-400 5-Axis, high-speed VMC features 5-axis simultaneous or 4+1 axis applications. The standard machine is fitted with 2-axis rotary table size Ø320mm (12.6").

Better accuracy, more productivity, less manpower, higher profitability. The machine is designed for high-speed, high-precision and high-productivity machining that is suitable for such industries as aerospace, automotive industries, mold making or job shops.

Heavy-duty construction offers high rigidity with major parts of the machine constructed of high-quality cast iron, which offers superior stability. The column design is an inverted Y shape construction for superior rigidity and stability. The pre-tensioned Class C3 ball screws are used in all three axes. All servo motors are directly coupled to ball screws, increasing movement sensitivity while dramatically reducing backlash.

QP5X-400

Table Size: Ø320mm (12.6")

WorkPiece Dimensions: Ø400 x H350mm
(15.7" x H13.7")

Table Load: 100kg (220 lbs.)

Spindle Motor: 15kW (20HP) FANUC

Feedrate: A-axis: 25 rpm, C-axis: 25 rpm

Spindle Taper: #40

Linear Rapid Speed: 36 / 36 / 30 m/min
(1,417 / 1,417 / 1,181imp)

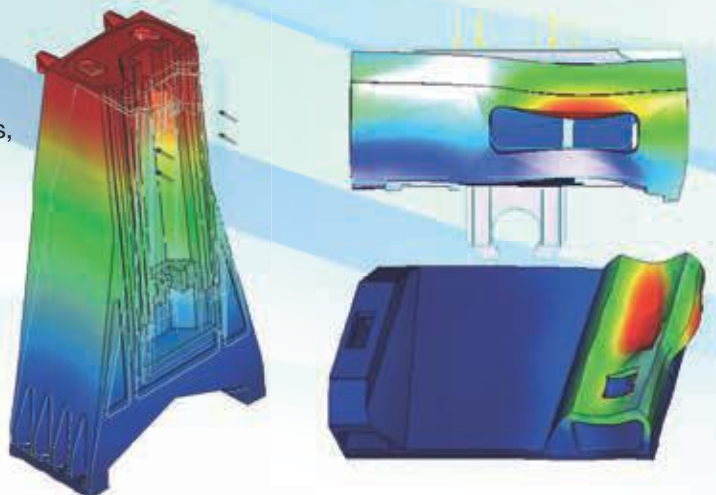
Tool Capacity: 30 Tools



Note : Machine shown with optional accessories

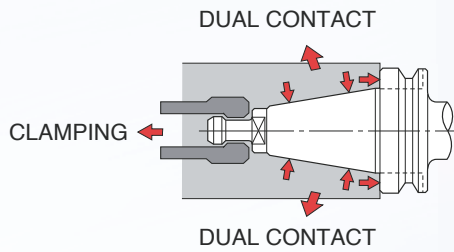
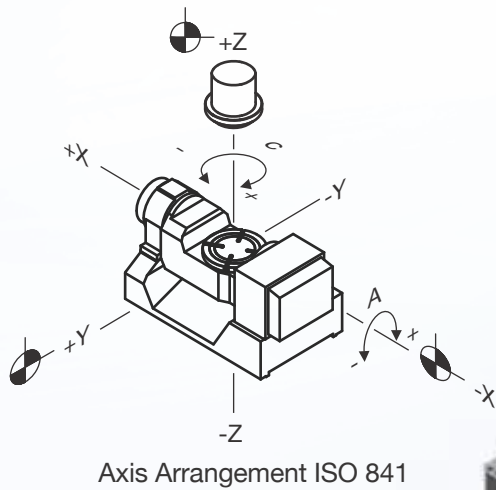
Topology Analysis & Finite Element Method (FEM)

Simulation uses topology analysis & FEM methods to calculate the displacements and stresses in a machine design due to operational loads such as: forces, pressures, to ensure superior stability and rigidity.



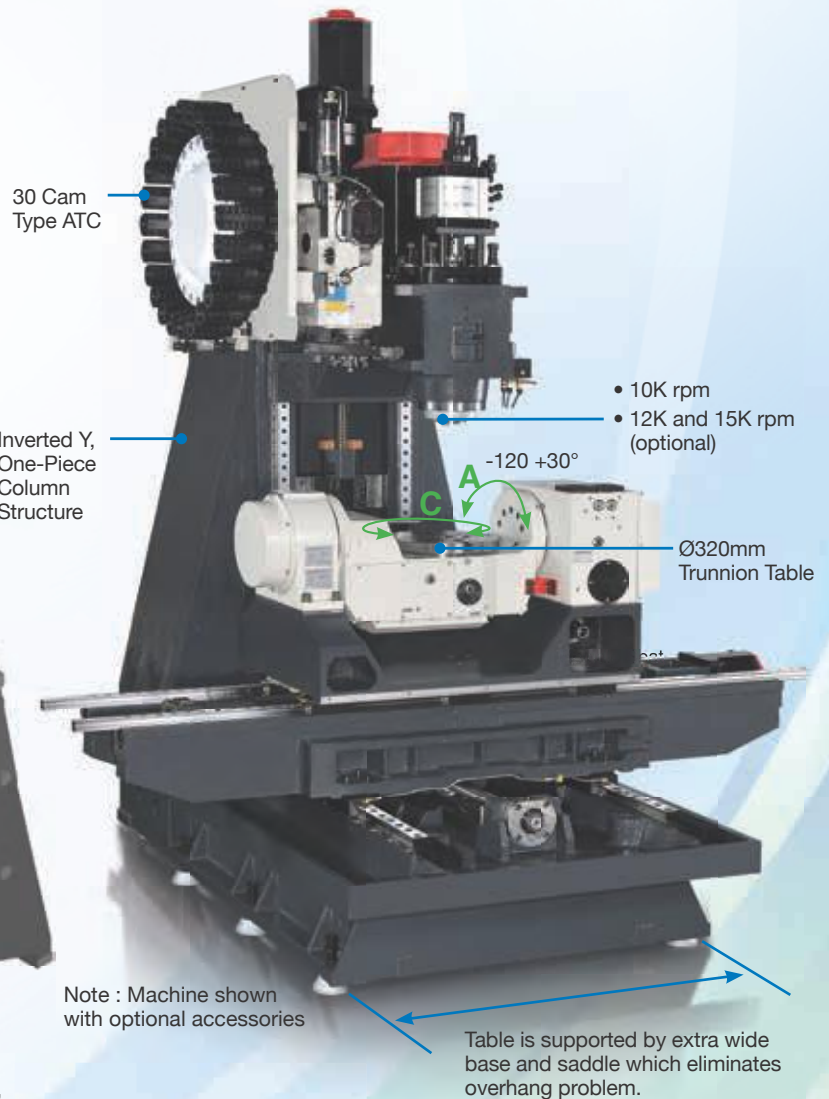
QP5X-400

Machine Structure



BBT Taper Dual Contact Spindle

Inverted Y-axis, one-piece column structure



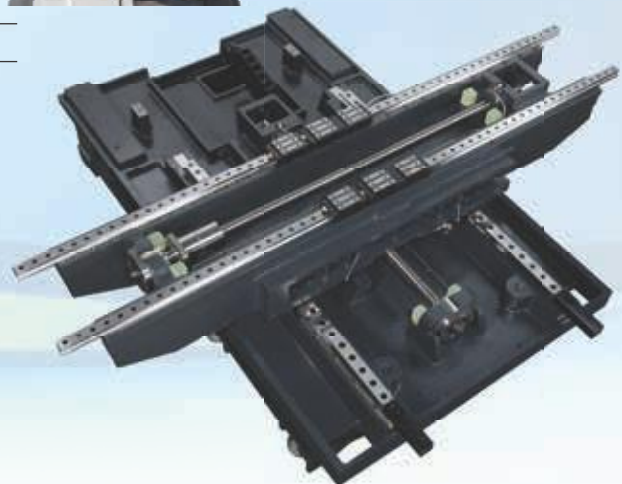
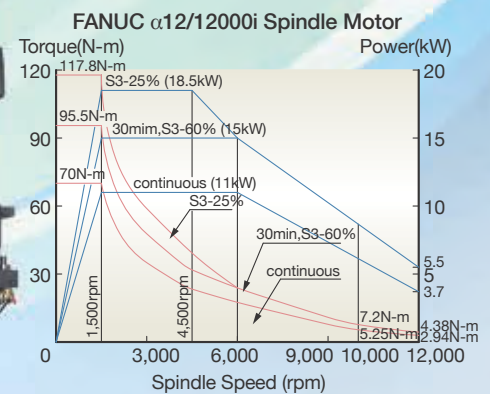
Spindle

- Spindle design: Big-diameter BBT spindle design uses four-piece, P4 Class, high-precision, angular-contact ball bearings to increase spindle rigidity and loading capacity and to maintain high accuracy during high-speed machining.
- Direct spindle for low noise, vibration and thermal expansion.

Spindle	Spindle Taper	#40
	Spindle Speed	10K rpm (12K, 15K optional)
	Transmission Type	Direct drive
	Spindle dia.	70mm

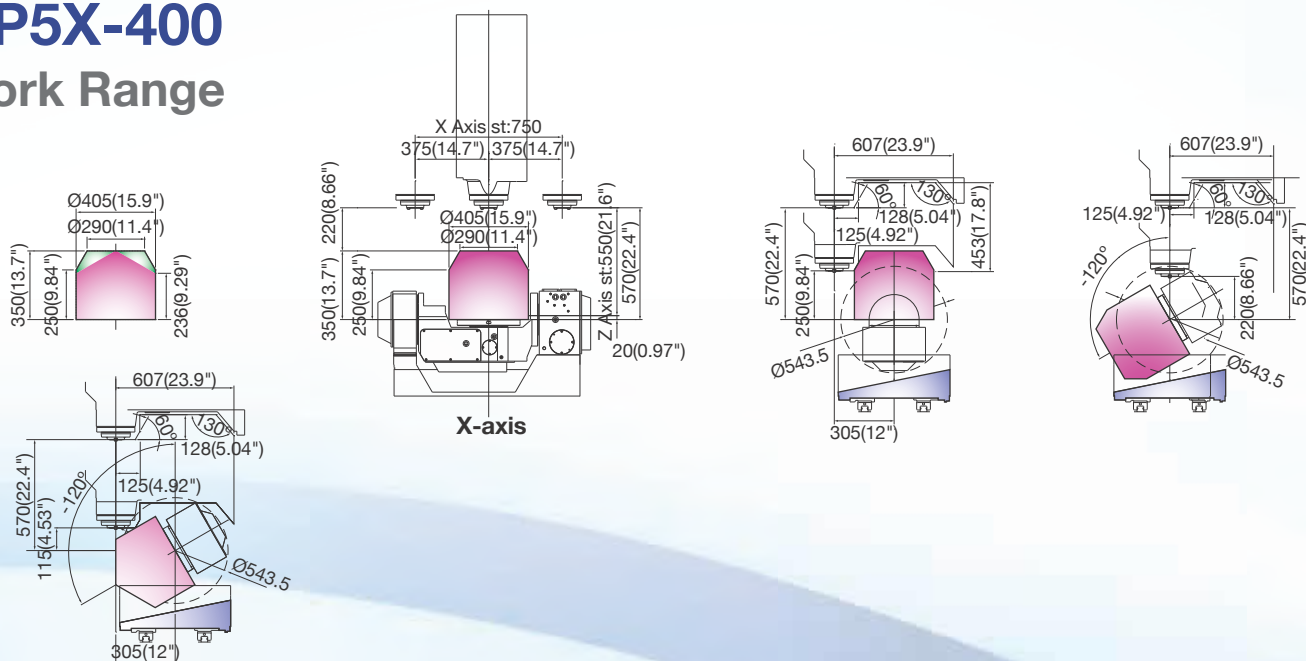
Linear Axis

- Large Y axis travel gives more room for machining wider parts.
- All linear axes are direct coupling with ballscrew and servo motor to reduce vibration and backlash.
- Standard linear roller guide ways in all three axes.



QP5X-400

Work Range

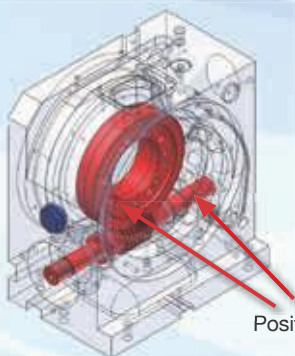
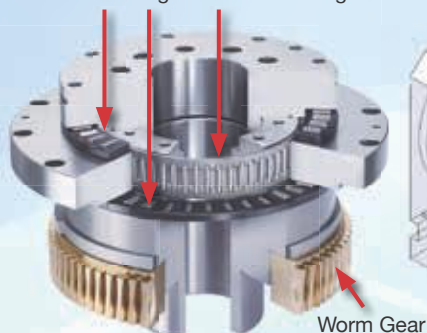


Workpiece Dimensions

2-axis Rotary Table

A heavy-duty 3-piece cross roller bearing provides excellent part loading and machining capability. $\pm 10''$ angle encoder for A axis.

Axial bearing and radial bearing



Positioning by worm and worm gear.



A-axis Tilting | C-axis Rotation

Table Load	100kg (220 lbs.)	
Through Hole	Ø50mm	
Indexing Accuracy	12 secs.	20 secs.
Repeatability Accuracy	5 secs.	10 secs.
Min. Input Increment	0.001°	
Max. Table Rotation Speed	25 rpm	
Clamping Torque	140 kg-m	70 kg-m
Braking Pressure(Air Source)	5 kgf/cm ²	

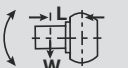
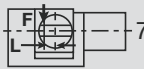
Tool Magazine System

- Tool shank: #40
- Tool capacity: 30+1 tools
- Max. tool length: 300mm (11.8")
- Max. tool weight: 7kg (15.4 lbs)
- Max. tool diameter: with neighbor tool: 76mm (3")
without neighbor tool: 125mm (4.9")
- Driven type: Cam type

Automatic Tool Changing System

- Tool change time: Tool to tool: 2.5 sec.
Chip to chip: 4.3 sec.

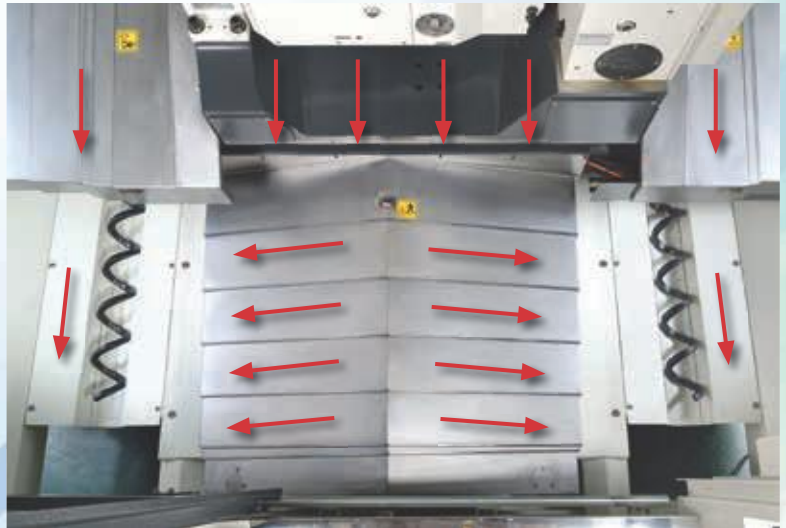


Allowable Loading Capacity		100kg
		100kg
Allowable Work Movement		100Nm
Allowable Load (When Table Clamped)		16,000N
		700Nm
		1,400Nm

QP5X-400

Efficient Chip Disposal Design

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



Note : Machine shown with optional accessories

Application



Name of the work-piece	Cutting Material	Tool	Cutting Mode	Speed (RPM)	Feed rate (mm /min)	Total Time
Standard part 102*102*45(mm)	AL-6061	EDM D12	Rough	6000	1800	1:01:40
		DRILL D12	Rough	1800	80	
		EDM D10	Rough	6000	1200	
		EMD D10	Finish	4200	480	
		Chamfering D6	Finish	8000	600	

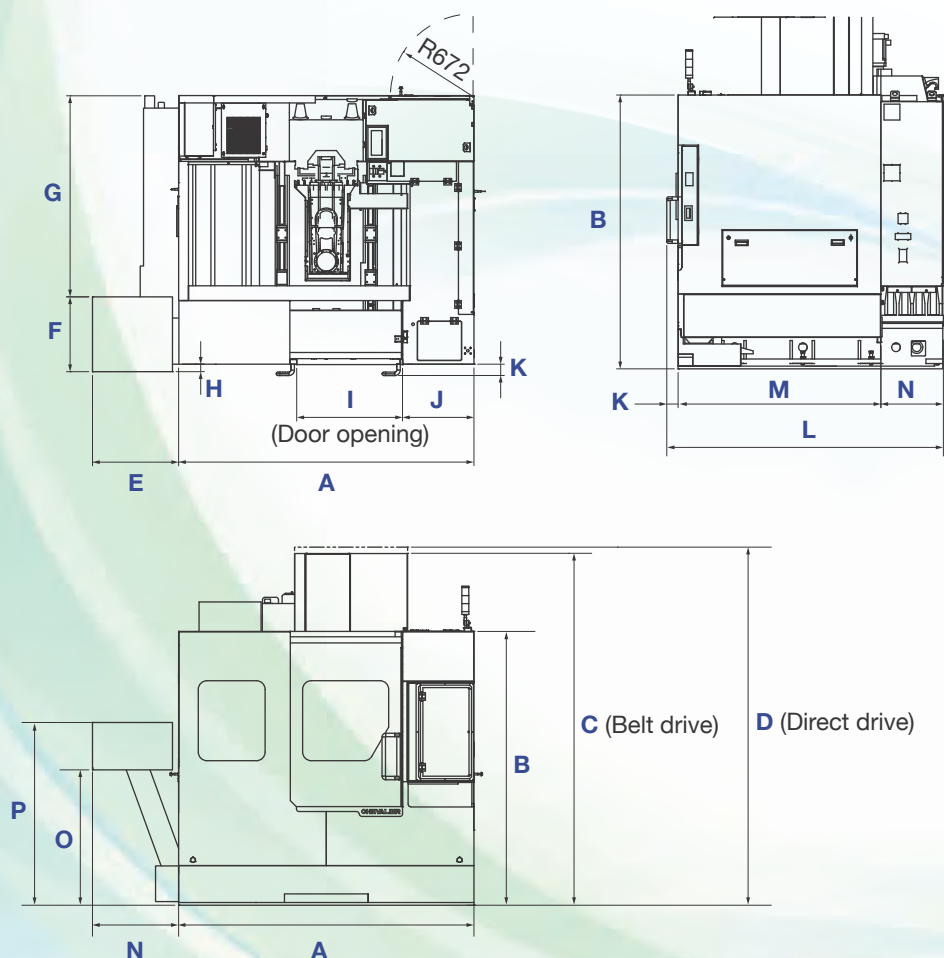


Name of the work-piece	Cutting Material	Tool	Cutting Mode	Speed (RPM)	Feed rate (mm /min)	Total Time
Honeycomb 100*100*40(mm)	AL-6061	EDM D10	Rough	8000	2400	1:21:57
		DRILL D10	Rough	2000	80	
		EDM D4	Rough	8000	1200	
		EDM D4	Finish	10000	1000	



QP5X-400

Dimensional Drawing



Item	QP5X-400
A	2,400mm (94.4")
B	2,225mm (87.6")
C	2,860mm (112.6")
D	3,020mm (118.9")
E	700mm (27.5")
F	608mm (23.9")
G	1,634mm (64.3")
H	61mm (2.4")
I	820mm (32.2")
J	580.5mm (22.8")
K	92mm (3.62")
L	2,248mm (88.5")
M	1,648mm (64.9")
N	508mm (20")
O	1,100mm (43.3")
P	1,485mm (58.5")

Inspection

After assembling, all machines are measured and calibrated by laser calibration, Ball Bar testing and Non Bar Dynamic Accuracy Measuring.

Optical Type Non-Bar Five-axis Machine Tool Dynamic Accuracy Measurement and Compensation System

This measurement technology includes measuring and compensating the static/ dynamic backlash of the transmission and the rotary axes. Especially for static backlash calibration, the static backlash error of transmission axis can be compensated to 1 μ m, and the rotary axis static backlash error can be compensated to 0.001°. Thus the machining accuracy of the machine can be increased.



QP5X-400

Specifications

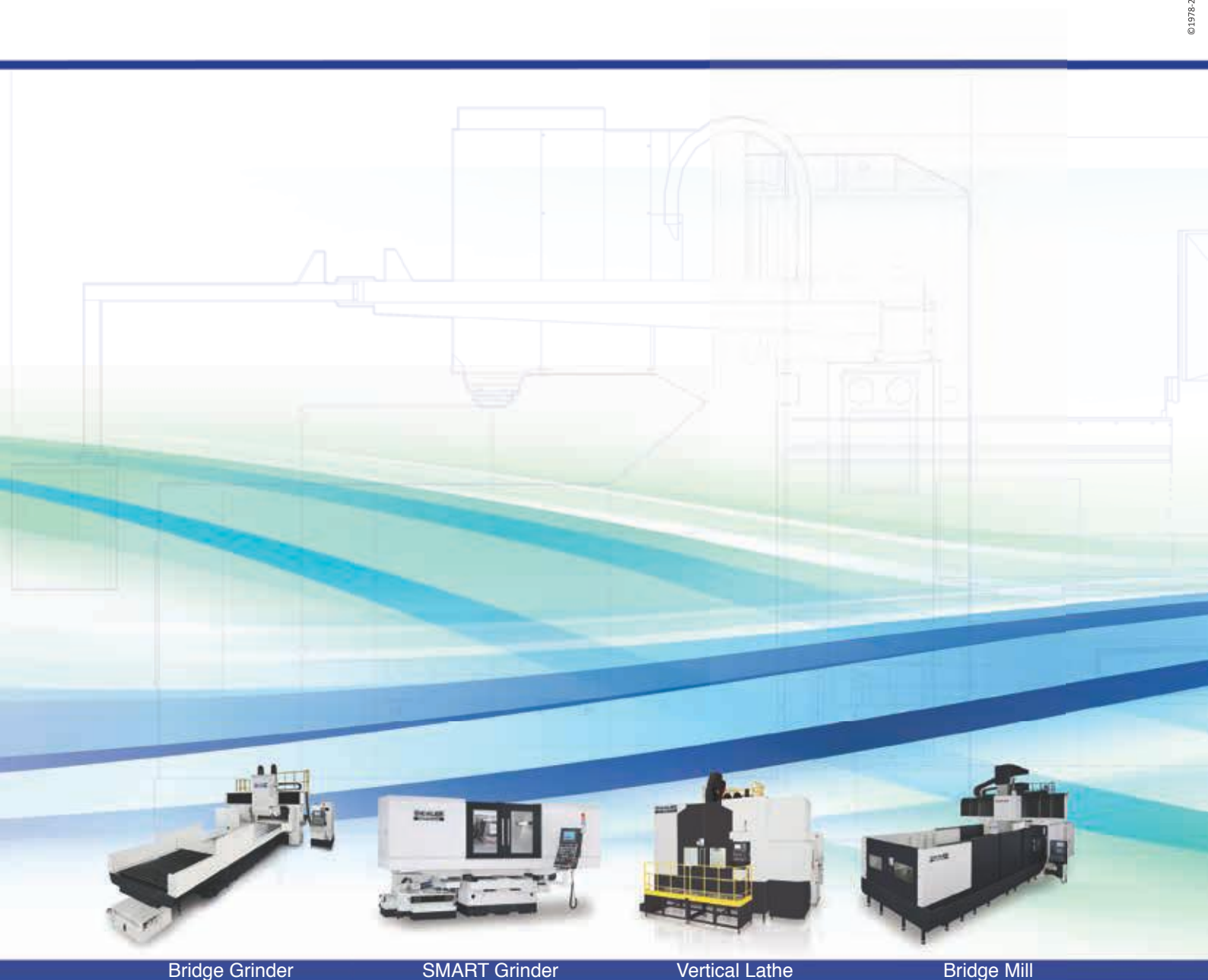
QP5X-400	Description	Unit	Specifications
Capacity	Working table size	mm (")	Ø320 (Ø12.6")
	Workpiece dimensions	mm (")	Ø400 x H350 (Ø15.7"x H13.7")
	Table load	kg(lbs)	100 (220)
Linear Axis Travel	X-axis	mm (")	750 (29.5")
	Y-axis	mm (")	610 (24")
	Z-axis	mm (")	550 (21.6")
X / Y / Z-axis Feed Rate	Rapid speed	m/min.(ipm)	36/36/30 (1,417/1,417/1,181)
	Cutting feed rate	m/min.(ipm)	10/10/10 (394/394/394)
Accuracy	VDI3441 positioning	mm (")	0.010 (0.0004")
	VDI3441 repeatability	mm (")	0.007(0.0003")
	A axis positioning	sec.	12
	C axis positioning (while with optional angle encoder)	sec.	20(12)
	A axis repeatability	sec.	5
	C axis repeatability (while with optional angle encoder)	sec.	10(4)
Rotary Axis	A-axis	degree	(+30 / -120)
	C-axis	degree	360°
	A/C axis rotation speed	rpm	25
Spindle	Spindle taper	-	#40
	Spindle power	kW(HP)	15(20) FANUC
	Spindle speed	rpm	10K (Optional 12K, 15K)
	Pull Stud	-	MAS-P40T-1
	Spindle center to column	mm (")	685 (27")
	Spindle nose to table surface	mm (")	20-570 (0.785" ~ 22.4")
Tool Magazine	Tool storage capacity	pcs	30 ATC
	Max. tool diameter with adjacent tool	mm (")	76 (3")
	Max. tool diameter without adjacent tool	mm (")	125 (4.9")
	Maximum tool length	mm (")	300 (11.8")
	Maximum tool weight	kg (lbs)	7 (15.4)
Other	Air source	kg/cm2	5.5
	Water tank capacity	L	570
Control			FANUC 0iM
Total Power Consumption (approx.)		kVA	25
Floor Space (W x L x H)		mm (")	2,450 x 2,200 x 3,020 (96.5" x 87" x 119")
Machine Weight		kg (lbs.)	7,050 (15,510)

Standard Accessories

1. Direct-drive spindle (10K rpm)
2. Spindle air seal
3. Cutting blast
4. Spindle oil chiller
5. FANUC 0iM control
6. 10.4" TFT monitor
7. User-friendly control panel
8. Remote MPG
9. RS232/USB interface/Ethernet
10. Full guard
11. 3-Axes telescopic cover
12. 30+1 arm-type ATC
13. A-axis angle encoder(±10")
14. Automatic way lubrication system
15. Pneumatic system
16. Rear chip flush
17. Electric cabinet power indication lamp
18. Air gun
19. LED work lamp
20. 3 color warning lamp
21. Coolant system
22. Tool box
23. Operation manual
24. Leveling bolts and pads

Optional Accessories

1. Direct-drive spindle (12K, 15K rpm)
2. CTS preparation
3. High pressure coolant through spindle
4. 40-station, chain type ATC
5. 3-axes linear scales
6. C-axis angle encoder (±5")
7. Workpiece measurement system
8. Tool length measurement
9. Internal dual-screw chip augers
10. Lift-up chip conveyor
11. Oil skimmer
12. Water gun
13. Air conditioner for electric cabinet
14. Transformer
15. SIEMENS 828D Control: 10.4" TFT LCD color monitor (4-Axis Simultaneous)
16. FANUC 31iB-5: 10.4" TFT LCD color monitor (5-Axis Simultaneous)
17. HEIDENHAIN TNC640HSCI: 15" TFT LCD color monitor (5-Axis Simultaneous)



Bridge Grinder

SMART Grinder

Vertical Lathe

Bridge Mill

FALCON MACHINE TOOLS CO., LTD.

No. 34, Hsing Kong Road, Shang Kang, Chang Hua
TAIWAN 509

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 notice or obligation.