CHEVALIER®

Grinding / Turning / Milling





QP-L Series

High Speed
Vertical Machining Center

QP1620-L · 2033-L · 2040-L
QP2440-L · 2560-L

QP1620-L

VERTICAL MACHINING CENTER (LINEAR WAYS)

MACHINE FEATURES

This vertical machining center is designed and built to meet the ever-increasing demands for high efficiency, high accuracy machining, such as 3C components production, and other applications that require a powerful and reliable machine to minimize the manufacture cost.

■ Spindle Speed

#30 Directly Coupled : 15,000rpm
: 12,000rpm (Optional)
#40 Belt drive : 10,000rpm
: 12,000rpm (Optional)

■ Rapid on (X / Y / Z) Axes

48 / 48 / 36m/min (189 / 189 / 1,417 ipm)

■ Tool Change Time

T-T : 1.0 sec.
C-C : 2.0 sec.

■ Control

Fanuc 0iMD
Siemens 828D (With SHOPMILL)
Heidenhain iTNC530



QP1620-L : (W) 1,680 x (L) 2,339mm

Note : Machine shown with optional accessories

QP1620-L

MACHINE CONSTRUCTION



Tool Magazine System

Tool Shank : #30, #40

Tool Capacity : 20 Tools

Max. Tool Diameter : 200mm (7.9")

Max. Tool Weight : 4kg (#30), 5kg (#40)

Max. Tool Diameter With Neighbor Tool : 80mm (3.1")

Without Neighbor Tool : 125mm (4.9")

Driven Type : Cam Type

Automatic Tool Changing System

- Tool Change Time : Tool To Tool : 1.0 sec. Chip To Chip : 2.0 sec.
- Tool Changing : Arm Type 20+1

Spindle Design (#30Direct Drive)

- Spindle Motor : FANUC 0iMD α2 / 15,000i, 2.2 / 3.7kW (cont./15min) (Optional α3 / 12,000i, 3.7 / 5.5kW (cont. / 30min)
- Spindle design : Big diameter spindle design adopt 4 piece P4 (Class) High precision angular contact ball bearings to increase spindle rigidity and loading capacity, and keep high accuracy during high speed machining.
- Max. rigid tapping speed : 6,000rpm



QP1620-L



Powerful Chip Disposal Design

- Automatic chip flushing system will bring cutting chips to the center part of the machine base. And then screw type chip conveyor will deliver the cutting chips to the chip collector which is located at the rear side of machine base.

Chip Collector and Coolant System

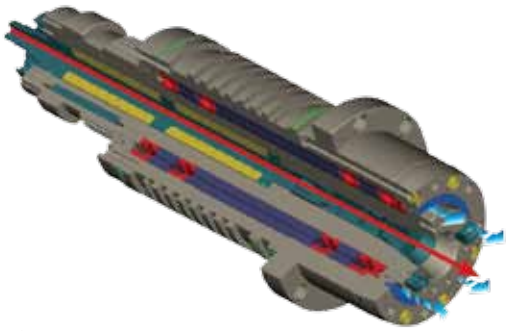
- Tank Capacity : 160L
- Oil Skimmer (Optional)
- Chip Conveyor (Optional)



QP1620-L

MACHINE CONSTRUCTION

#40 Spindle



Coolant through spindle (Optional)
Spindle air purge (Standard)



Air Counter Balance System

- Z-axis spindle head is equipped with air counter balance system to ensure the accuracy of Z-axis.



High Rigidity Machine Construction

- High rigidity components are used and machine base is supported by full travel, thus the machine is very suitable for high-speed machining.
- Servo motor coupling directly linked with the screw to ensure machining accuracy.

Compact and Rigid Machine Construction

- This compact, but rigidly designed, 3-axes linear way machine requires very small floor space. The major parts of the machine are constructed of high-quality Meehanite cast iron which offer best stability of the machine.



QP2033-L / 2040-L / 2440-L / 2560-L

VERTICAL MACHINING CENTER (LINEAR WAYS)

MACHINE FEATURES

This vertical machining center is designed and built to meet the ever-increasing demands for high efficiency, high accuracy machining, such as 3C components production, and other applications that require a powerful and reliable machine to minimize the manufacture cost.

■ Spindle Speed (QP2033-L / 2040-L)

Belt Drive : 10,000rpm
: 8,000rpm / 12,000rpm (Optional)
Directly Coupled : 12,000rpm / 15,000rpm (Optional)

■ Spindle Speed (QP2440-L / 2560-L)

Belt Drive : 10,000rpm :
8,000rpm / 12,000rpm (Optional)
Directly Coupled : 10,000rpm :
12,000rpm / 15,000rpm (Optional)

■ Tool Capacity

24 Arm type
32 Chain type (Optional)

■ Rapid on (X / Y / Z) Axes

QP2033-L / 2040-L / 2440-L
36 / 36 / 24m/min (1,417 / 1,417 / 945ipm)
36 / 36 / 30m/min (1,417 / 1,417 / 1,180ipm) (Optional)

QP2560-L
30 / 30 / 30m/min (1,180 / 1,180 / 1,180ipm)
24 / 24 / 20m/min (945 / 945 / 787ipm) (Optional)



QP2560-L : (L) 3,560 x (W) 2,250mm

Note: Machine shown with optional accessories

QP2033-L / 2040-L / 2440-L

VERTICAL MACHINING CENTER (LINEAR WAYS)





QP2033-L : (L) 2,430 x (W) 2,115mm
QP2440-L : (L) 2,800 x (W) 2,200mm

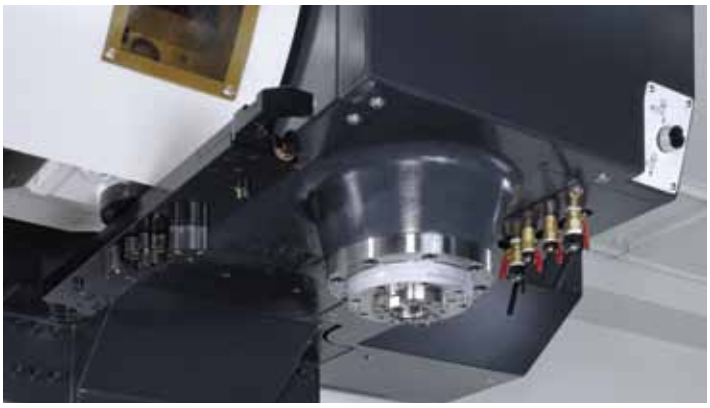
Note: Machine shown with optional accessories

QP2440-L / 2560-L

MACHINE CONSTRUCTION

Automatic Tool Changing System

- Tool Change Time :
  Tool To Tool : 1.8 sec.
  Chip To Chip : 4.0 sec.
  Arm Type: 24+1





QP2440-L



QP2560-L

QP2033-L / 2040-L / 2440-L / 2560-L

MACHINE CONSTRUCTION

High Accuracy Ballscrews

• 3-axes C3 pretensioned ballscre W Ø40mm x P12mm (Ø157" x 0.47").



Arm



Chain

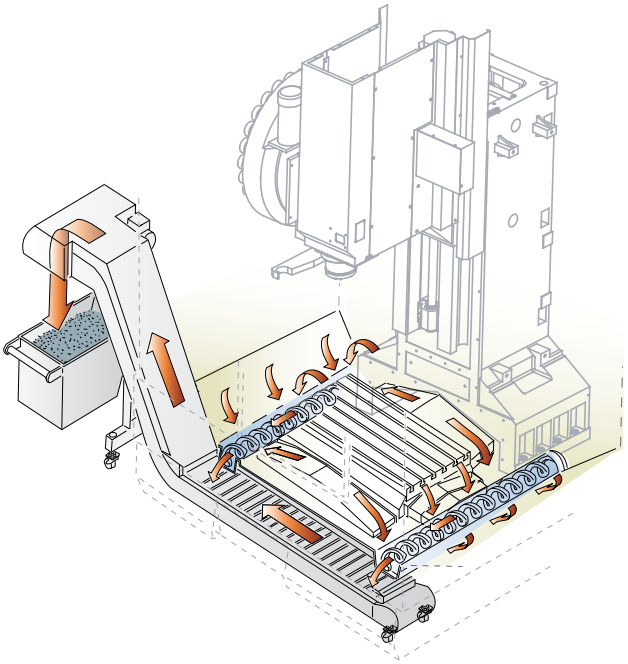


A.T.C Mechanism	Arm	Chain
Tool Shank	BT40 / CT40 / DIN40 / JT40	
Tool Capacity	24	32 (Optional)
Tool Selection	Random	Random
Tool Access	Bi-Directional	



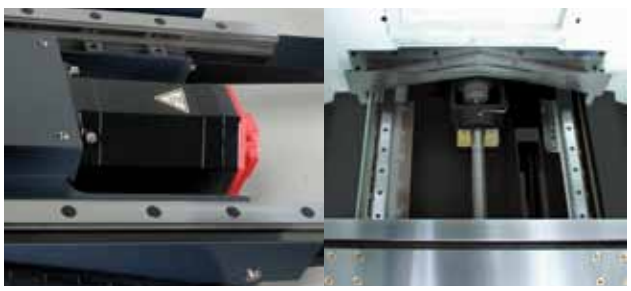
X / Y / Z Linear Ways

• 3-axes linear ways, 35mm (1.33") width, Z-axis use lenghtened sliding block for heavier rigidity.
• Y-axis stroke 530mm (20.9") for QP2033/2040-L, 610mm (24") for QP2440-L and 635mm (25") for QP2560-L
• Dual chip auger (Optional)
• Linear roller guide ways (Standard)



Easy Chip Flow Splash Guard Design

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



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.



QP-L Series
CONTROL

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



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. art 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

HEIDENHAIN
iTNC530 HSCI 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 fl at-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

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

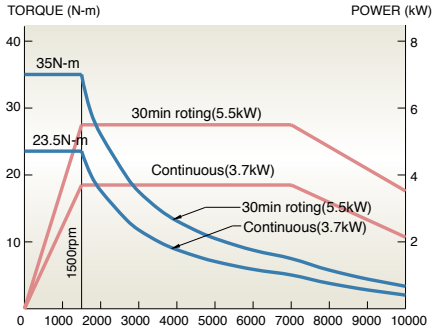
SIEMENS
828D Control



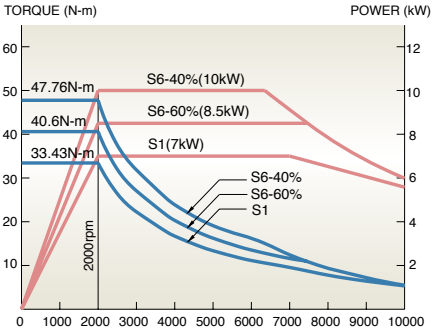
SPINDLE TORQUE CHART

QP1620-L

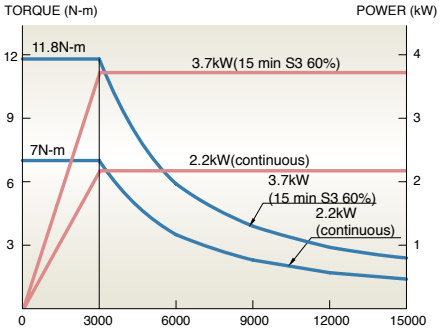
1. FANUC 5.5kW AC Spindle Motor for #40



2. SIEMENS 8.5kW AC Spindle Motor for QP1620-L #40

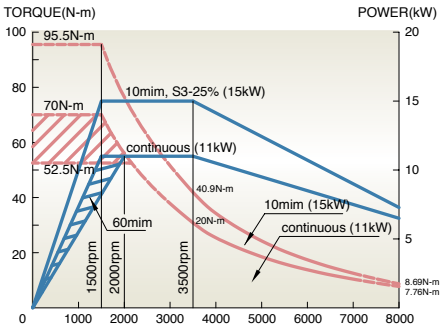


3. FANUC α2i/15,000 AC Spindle Motor for QP1620-L #30

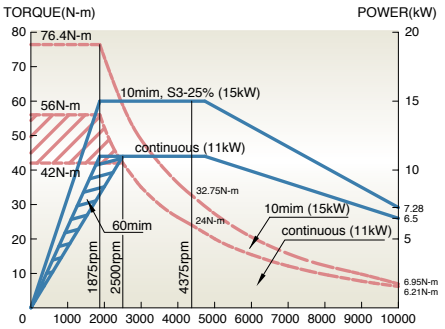


QP2033 / 2040 / 2440 / 2560-L

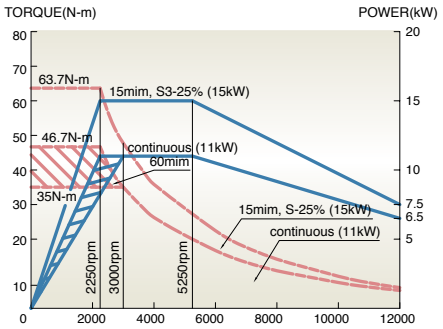
1. 8,000rpm FANUC β12i (15kW) Spindle Motor



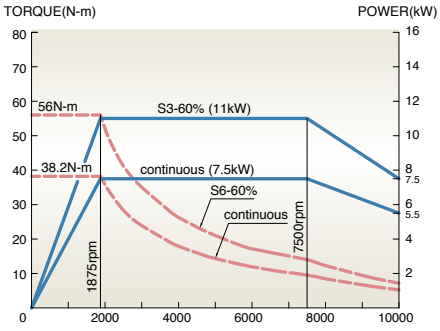
2. 10,000rpm FANUC β12i (15kW) Spindle Motor



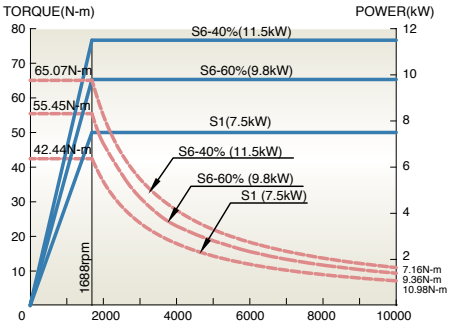
3. 12,000rpm FANUC β12i (15kW) Spindle Motor



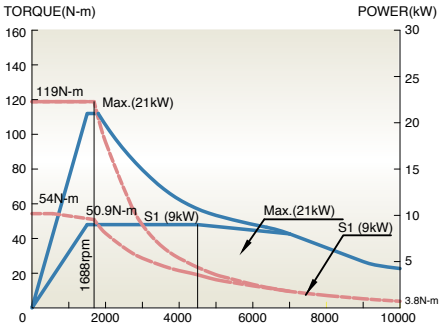
4. 10,000rpm FANUC α8i (11kW) Spindle Motor



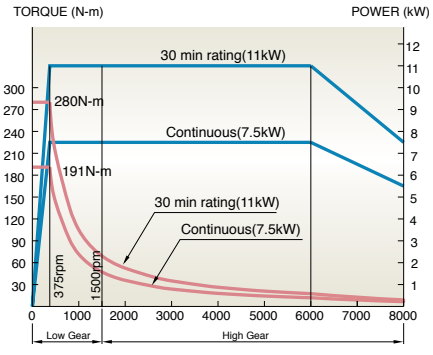
5. 10,000rpm HEIDENHAIN QAN-200L Spindle Motor



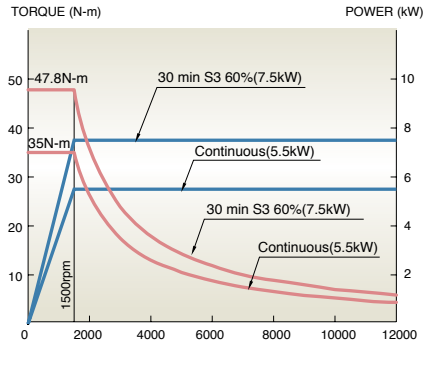
6. 10,000rpm SIEMENS 1PH8107 Spindle Motor



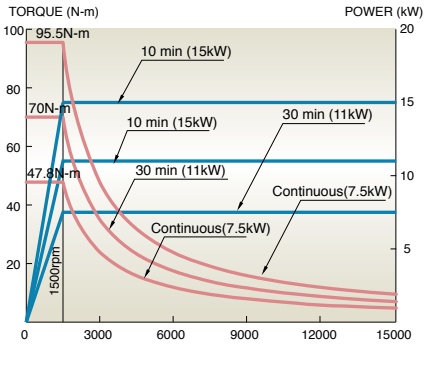
7. 8,000rpm FANUC α8i (11kW) With ZF Gear Box



8. Directly coupled 12,000rpm FANUC α6i (7.5kW) Spindle Motor



9. Directly coupled 15,000rpm FANUC αT8i (11kW) Spindle Motor

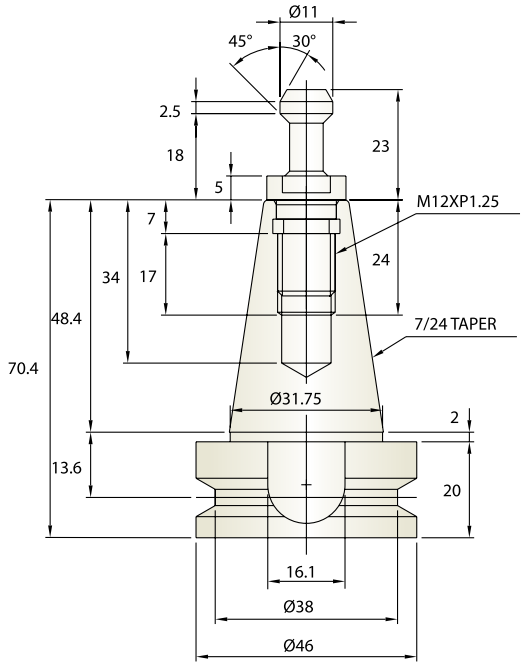


TOOL SHANK AND PULL STUD

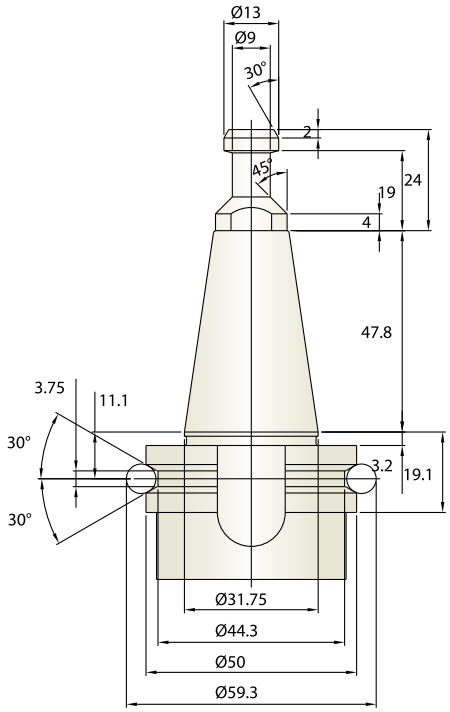
QP1620-L (#30)

UNIT : mm (")

BT-30



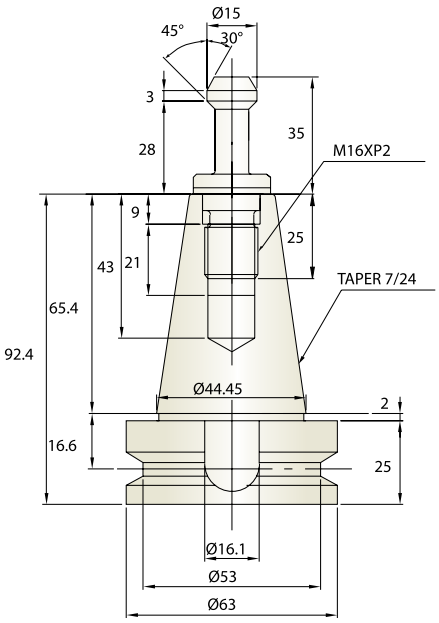
DIN-30



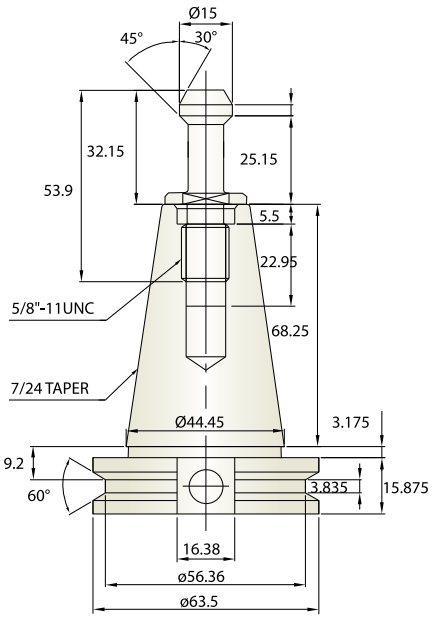
QP2033 / 2040 / 2440 / 2560-L (#40)

UNIT : mm (")

BT-40



CT-40



DIN-40

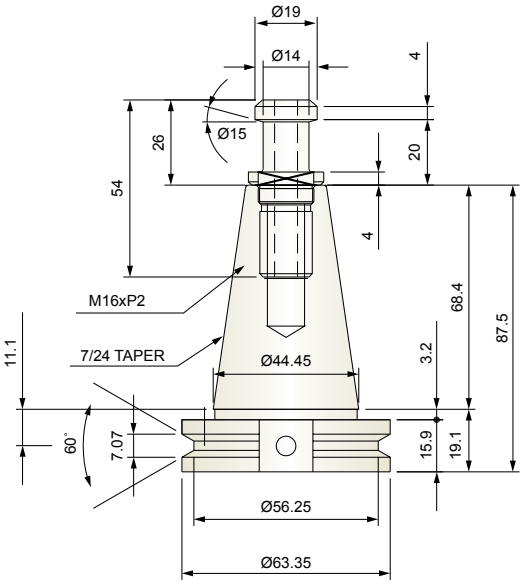
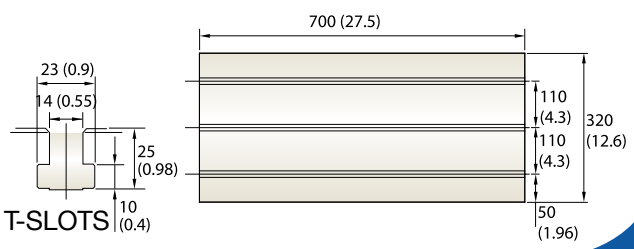


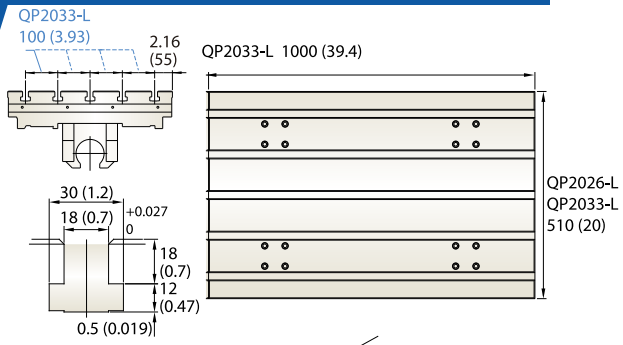
TABLE DIMENSIONS

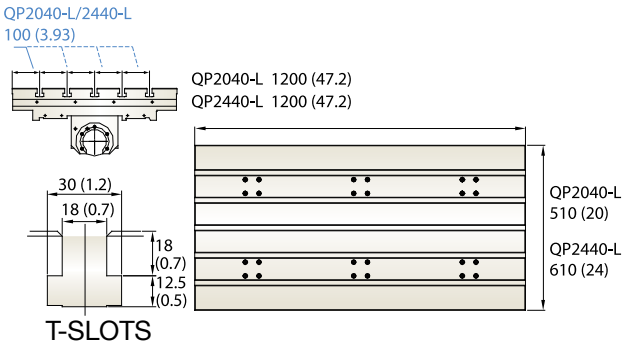
UNIT : mm (")

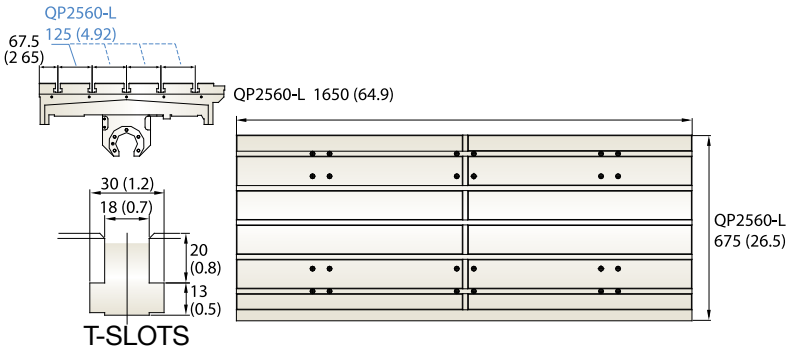
QP1620-L

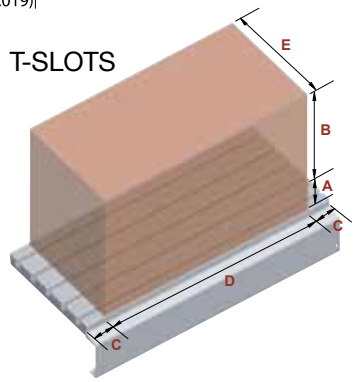


QP2033 / 2040 / 2440 / 2560-L









Model	A	B	C	D	E
QP2033-L	130 (5.1)	510 (20.1)	75 (2.9)	850 (33.5)	510 (20.0)
QP2040-L	130 (5.1)	510 (20.1)	90 (3.5)	1,020 (40.1)	510 (20.0)
QP2440-L	130 (5.1)	550 (21.6)	90 (3.5)	1,020 (40.1)	600 (23.6)
QP2560-L	130 (5.1)	635 (25.0)	90 (3.5)	1,470 (57.9)	610 (24.0)

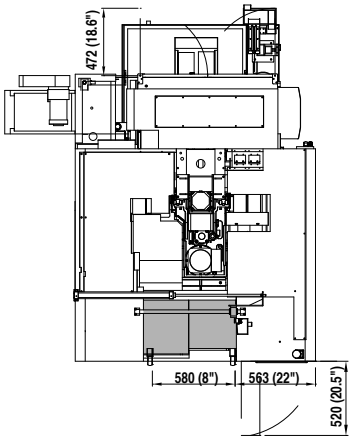
EXAMPLE

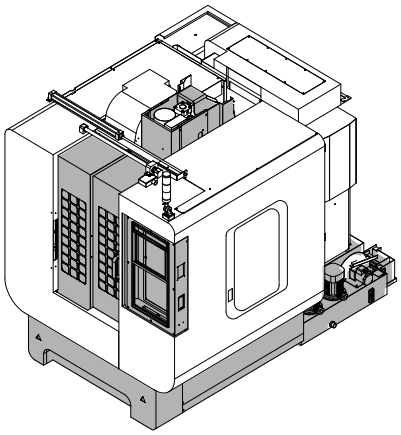
Workpieces	Multi-machining (Milling,Drilling,Tapping)	Optical fiber box Milling-Drilling Tapping		
QP1620-L				
Machine	QP1620-L #30	QP1620-L #30		
Material	Aluminum Alloy (A5052)	Brass Alloy 360		
Dimensions	160mm x 120mm x 18mm (6.3" x 4.7" x 0.7")	58mm x 27mm x 10mm (2.3" x 1.1" x 0.4")	32mm x 16mm x 9mm (1.3" x 0.6" x 0.4")	29mm x 20mm x 10mm (1.2" x 0.8" x 0.4")
Time	4 min 23 sec	3 min 54 sec	2 min 31 sec	2 min 28 sec

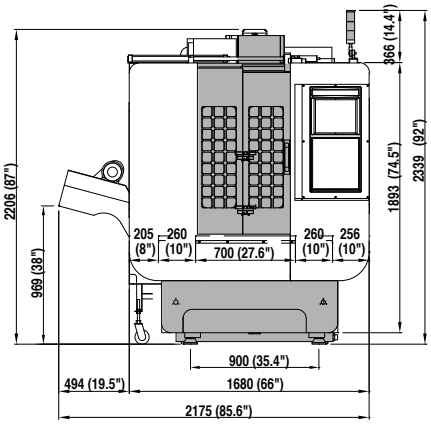
Workpieces	Mouse-Shell	Pneumatic-Tool Mold	Detergent Container
QP20-L QP24-L QP25-L Series			
Material	SKD-11	NAK-80	SKD-11
Hardness	HRC-52	HRC-40	HRC-52
Dimensions	130mm x 90mm x 40mm (5.1" x 3.5" x 1.5")	200mm x 200mm x 150mm (7.8" x 7.8" x 5.9")	130mm x 90mm x 40mm (5.1" x 3.5" x 1.5")

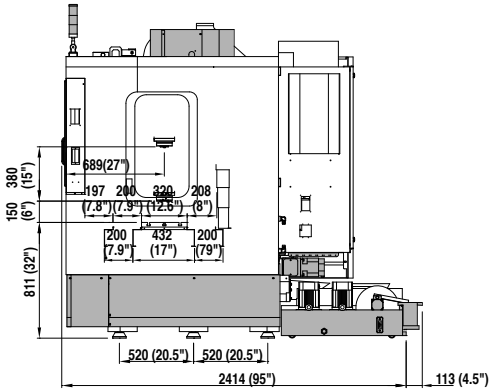
DIMENSIONAL DRAWINGS

QP1620-L



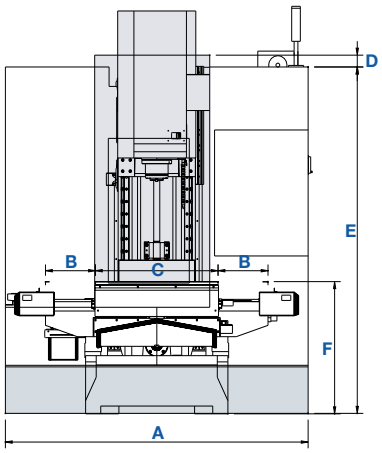


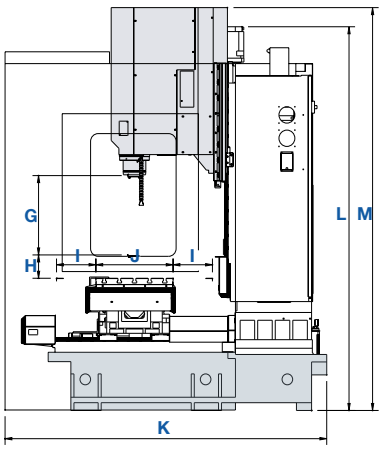




Item	QP2033-L	QP2040-L	QP2440-L	QP2560-L
A	2,430mm (95.6")	2,800mm (110")	2,800mm (110")	3,560mm (140")
B	425mm (16")	510mm (20")	510mm (20")	762.5mm (30")
C	1,000mm (39.4")	1,200mm (47")	1,200mm (47")	1,650mm (64.9")
D	76mm (3")		-	-
E	2,227mm (87.6")		2,230mm (87.8")	2,325mm (91.5")
F	850mm (33.5")	870mm (34.2")	870mm (34.2")	943mm (37.1")
G	510mm (20")		550mm (21.6")	635mm (25")
H	150mm (5.9")	130mm (5.1")	130mm (5.1")	125mm (4.9")
I	265mm (10.4")		305mm (12")	317.5mm (12.5")
J	510mm (20")		600mm (23.6")	610mm (24")
K	2,115mm (83.6")		2,200mm (86.6")	2,250mm (88.6")
L	2,467mm (97")		2,476mm (97.5")	2,620mm (103.1")
M	2,583mm (102")		2,668mm (105")	3,215mm (126.6")

QP2033-L / QP2040-L / QP2440-L / QP2560-L





SPECIFICATION

Description			QP1620-L		
Table	Table size	mm (")	700 x 320 (27.6 x 12.6)		
	T-Solts (no. x w x dis.)	mm (")	3 x 14 x 110 (3 x 0.6 x 4.3)		
	Table load	kg (lbs.)	250 (550)		
Travel	X-Travel	mm (")	520 (20.5)		
	Y-Travel	mm (")	400 (15.7)		
	Z-Travel	mm (")	380 (15)		
Spindle	Spindle nose to table	mm (")	150~530 (5.9~20.9)		
	Spindle center to column	mm (")	400 (15.7)		
	Spindle taper		#40 (7 / 24)	#30 (Optional CT30 / DIN30)	
	Spindle speed	rpm	Belt Drive: 100~10,000	Directly Coupled: 120~12,000	Directly Coupled: 150~15,000
	Spindle diameter	mm (")	60 (2.4)	50 (2)	
Feed Rates	Rapid on (X / Y / Z) axes	m/min. (ipm)	48 / 48 / 36 (1,891 / 1,891 / 1,417)		
	Cutting feed rate	m/min. (ipm)	1-10 (0.04~394)		
	Vertical axis counter balance		Air equalizer		
Accuracy	Positioning (ISO 230-2 / VDI 3441)	mm	0.007		
	Repeatability ISO 230-2 / VDI 3441	mm	0.005		
ATC	Tool capacity		Arm: 20+1		
	Tool shank		BT40	BT30 (Optional CT30 / DIN30)	
	Changer time	sec.	T-T 1.0, C-C 2.0		
	Pull stud		P40T-1	P30T-1	
	Max. tool diameter	mm (")	80 (3.1)		
	Max. tool legth	mm (")	200 (7.9)		
	Max. tool weight	kg (lbs.)	5 (11)	4 (8.8)	
Motor	Spindle motor *	kW (cont./15)	(F) Belt Drive: 5.5 / 7.5 (S) Belt Drive: 7 (cont.)	Directly Coupled: 5.5 / 7.5	Directly Coupled: 3.7 / 5
	Drive motor (X, Y, Z)	kW	(F) 1.2 / 1.2 / 1.2 (S) 2.3 / 2.3 / 2.3	(F) 1.2 / 1.2 / 1.2	
	Coolant pump	HP (kW)	1 (0.76)		
General	Power required	KVA	15		
	Air required	kg/cm2 (L/min.)	5.5 (200)		
	Floor space (W x L x H)	mm (")	1,680 x 2,762 x 2,339 (66.1 x 108.7 x 92.1)		
	Machine net weight, approx	kg (lbs.)	2,300 (5,060)		

Standard Accessory

1. Arm type ATC
2. Coolant system
3. Fully enclosed splash guard
4. Work light
5. Central lubrication system
6. Piolt light
7. Spindle air blast
8. Rear chip flush system
9. Air blast chip blower (cutting air blast)
10. Air purge curtain
11. Tools and tool box
12. Leveling bolts and pads
13. Operation manual and parts list
14. Screw type chip conveyor (Only OP1620-L)

CNC Standard Features

1. Remote type manual pulse generator (MPG)
2. Rigid tapping

Optional Accessory

1. BT40, CT40, DIN-40, JT-40 pull suds
2. Chip conveyor
3. Belt drive: 8,000 / 12,000rpm spindle (Only QP20/ 24/ 25-L)
4. Directly coupled: 12,000 / 5,000rpm spindle (Only QP20/ 24/ 25-L)
5. 4th axis preparation
6. 4th axis complete set
7. Spindle oil chiller
8. Coolant through spindle
9. Automatic tool length measurement
10. Dual screw type chip conveyor (NA on QP1620-L)
11. 20-station carousel type ATC (NA on QP1620-L)
12. 32-station chain type tool magazine
13. Oil skimmer (NA on QP1620-L)
14. Air gun
15. Coolant gun
16. Linear scales
17. ZF gear box (NA on QP1620-L)
18. Heat exchanger for electric cabinet
19. Workpiece measurement

Note. (F) FANUC, (S) SIEMENS, (H) HEIDENHAIN Controller

QP2033-L	QP2040-L	QP2440-L	QP2560-L
1,000 x 510 (39.4 x 20.1)	1,200 x 510 (47.2 x 20.1)	1,200 x 600 (47.2 x 23.6)	1,650 x 635 (65 x 25)
5 x 18 x 100 (5 x 0.7 x 3.9)		5 x 18 x 100 (5 x 0.7 x 3.9)	5 x 18 x 125 (5 x 0.7 x 4.9)
500 (1,100)	600 (1,320)	600 (1,320)	1,500 (3,300)
850 (33.5)	1,020 (40.2)	1,020 (40.2)	1,525 (60)
530 (20.9)		610 (24)	635 (25)
510 (20.1)		550 (21.7)	635 (25)
150 ~ 660 (5.9~26)	130 ~ 640 (5.1~25.2)	130 ~ 680 (5.1~26.8)	125~760 (4.9~29.9)
585 (23)		685 (27)	
#40 (7/24)			#40 (7/24)
Belt Drive: 100~10,000 (Optional 8,000 , 12,000) Directly Coupled: 120~12,000 (Optional 10,000 , 15,000)			
70 (2.8)			70 (2.8)
36 / 36 / 24 (1,417 / 1,417 / 945), Optional 36 / 36 / 30 (1,417 / 1,417 / 1,180)			30 / 30 / 30 (1,180 / 1,180 / 1,180), Optional 24 / 24 / 20 (945 / 945 / 787)
1-10 (0.04~394)			
NA			Air Equalizer
0.01			
0.007			
Arm: 24+1 (Optional Arm: 32)			
BT40, CT40 or DIN40		BT40, CT40 or DIN40	
T-T 1.8, C-C 4.0		T-T 1.8, C-C 4.0	
P40T-1			
80 (3.1)			
300 (11.8)			
7 (15.4)			
(F) Belt Drive: 11 / 15 (F) Directly Coupled: 7.5 / 11 (S) Belt Drive: 9 (cont.) (H) Belt Drive: 7.5 (cont.)			(F) Belt Drive: 7.5 / 11 (F) Directly Coupled: 7.5 / 11 (S) Belt Drive: 12 (cont.) (H) Belt Drive: 10 (cont.)
(F) 1.8 / 1.8 / 2.5 (Optional 3.0 / 3.0 / 4.0) (S) 3.3 / 3.3 / 4.87 (H) 3.5 / 3.5 / 5.7			(F) 4.0 / 4.0 / 4.0 (S) 3.77 / 3.77 / 4.87 (H) 5 / 5 / 5.7
1 (0.76)			1 (0.76)
20			25
5.5 (200)			
2,430 x 2,115 x 2,583 (95.7 x 83.3 x 101.7)	2,800 x 2,115 x 2,583 (110.2 x 83.3 x 101.7)	2,800 x 2,200 x 2,600 (110.2 x 86.6 x 102.4)	3,560 x 2,250 x 3,215 (140.2 x 88.6 x 126.6)
5,800 (12,760)	6,200 (13,640)	6,700 (14,740)	8,500 (18,700)

INSPECTION



Laser Calibration

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



Ball Bar Testing

The machine 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 is accurate and properly aligned.

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Grinding Machine | Grinding Machine | Turning Machine | Milling Machine

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