

QP Box Way Series
Heavy Duty
Vertical Machining Centers

QP-2855 • 3560 • 3572 • 4088

QP2855 / 3560 / 3572 / 4088

HIGH PERFORMANCE VERTICAL MACHINING CENTER

With more than 30 years experience developing and manufacturing high precision machine tools, and to meet the current and future market demand for large workpiece machining, CHEVALIER has developed these QP Types Vertical Machining Centers.

- **Spindle Speed**

Belt Drive: 6,000 / 8,000 (Opt.)

Gear Drive: 6,000 (Opt.)

- **Tool Capacity**

24 Arm type

32 Chain type (Opt.)

- **Rapid on (X / Y / Z) Axes**

QP2855: 15 / 15 / 15 m/min (590 / 590 / 590 ipm)

QP3560/3572: 15 / 15 / 12 m/min (590 / 590 / 472 ipm)

QP4088: 12 / 12 / 12 m/min (472 / 472 / 472 ipm)

- **Control**

Fanuc OiMD

Siemens 828D (With SHOPMILL)

Heidenhain iTNC530



QP4088: (W) 6,000 x (L) 4,572mm

Note: Machine shown with optional accessories

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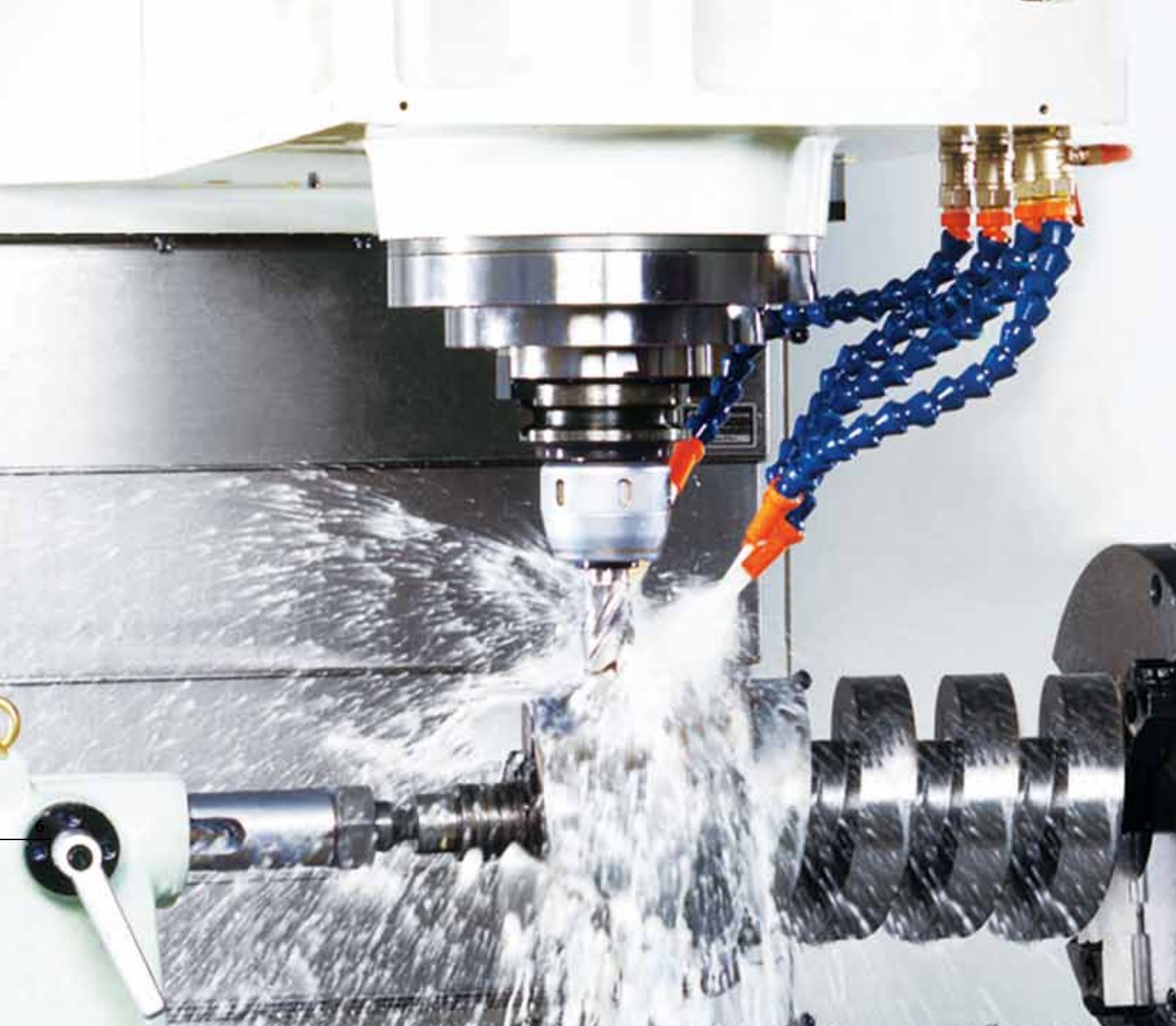
QP3572: (W) 5,084 x (L) 3,931mm

Note: Machine shown with optional accessories



QP2855: (W) 3,900 x (L) 3,513mm

Note: Machine shown with optional accessories



Machine Construction And Features

By adopting 4 hardened square ways on QP2855, QP3560 and QP3572, and 6 hardened square ways on QP4088, on machine base, this design offers the most rigid support for X-axis and Y-axis loading.

Large inside work area to assist work piece loading and unloading. And oversized Column Bottom also provides maximum support.

The machine is constructed of high quality Meehanite cast iron, heat treated for deformation-free performance.

3-axes slide ways are coated with Turcite B to ensure extremely smooth traverse and minimum wear on slide ways.

Table and saddle are fully supported through the entire stroke without overhang problem.

High precision class C3 ball screws on X, Y, Z-axes.

FANUC OiMD 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 (OiMD)
- 21 Number of registerable program: 400 (OiMD)
- 22 Background editing
- 23 Manual guide Oi
- 24 OiMD color 8.4" LCD

OiMD Control

Standard Control

- FANUC OiMD
8.4" TFT LCD color monitor

Other Control Available (Opt.)

- 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



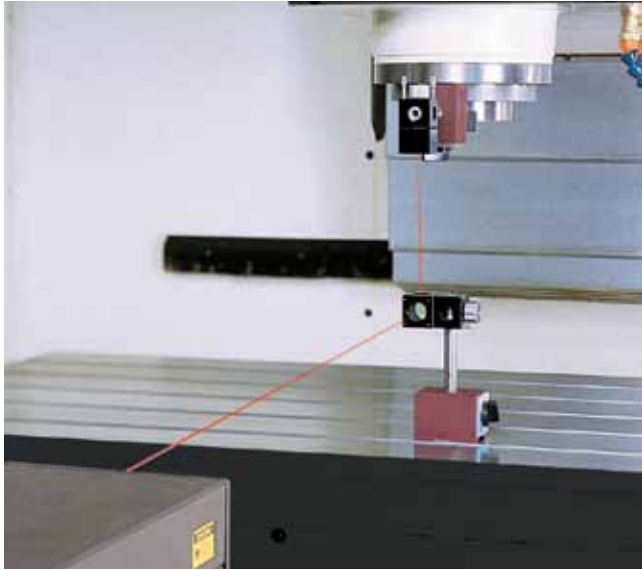
- 1 LCD color
- 2 Linear interpolation
- 3 Circular interpolation
- 4 Helical interpolation
- 5 Skip function
- 6 Plane select
- 7 Workpiece coordinate system
- 8 Coordinate system rotation
- 9 Rigid tapping
- 10 Mirror image, scaling, rotation
- 11 Canned cycles for drilling / milling
- 12 Tool function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

- 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

SIEMENS 828D Control



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

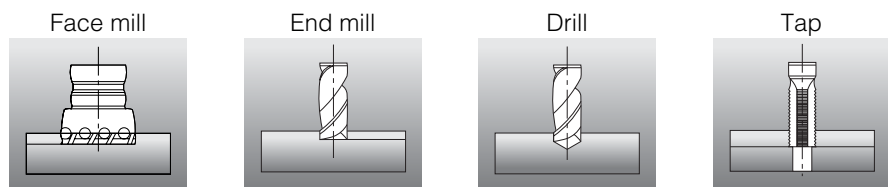
The machine is put through a series of circular moves in the X / Y plane, and 1/2 circle moves in the X / Z and Y / Z planes.

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 is accurate and properly aligned.

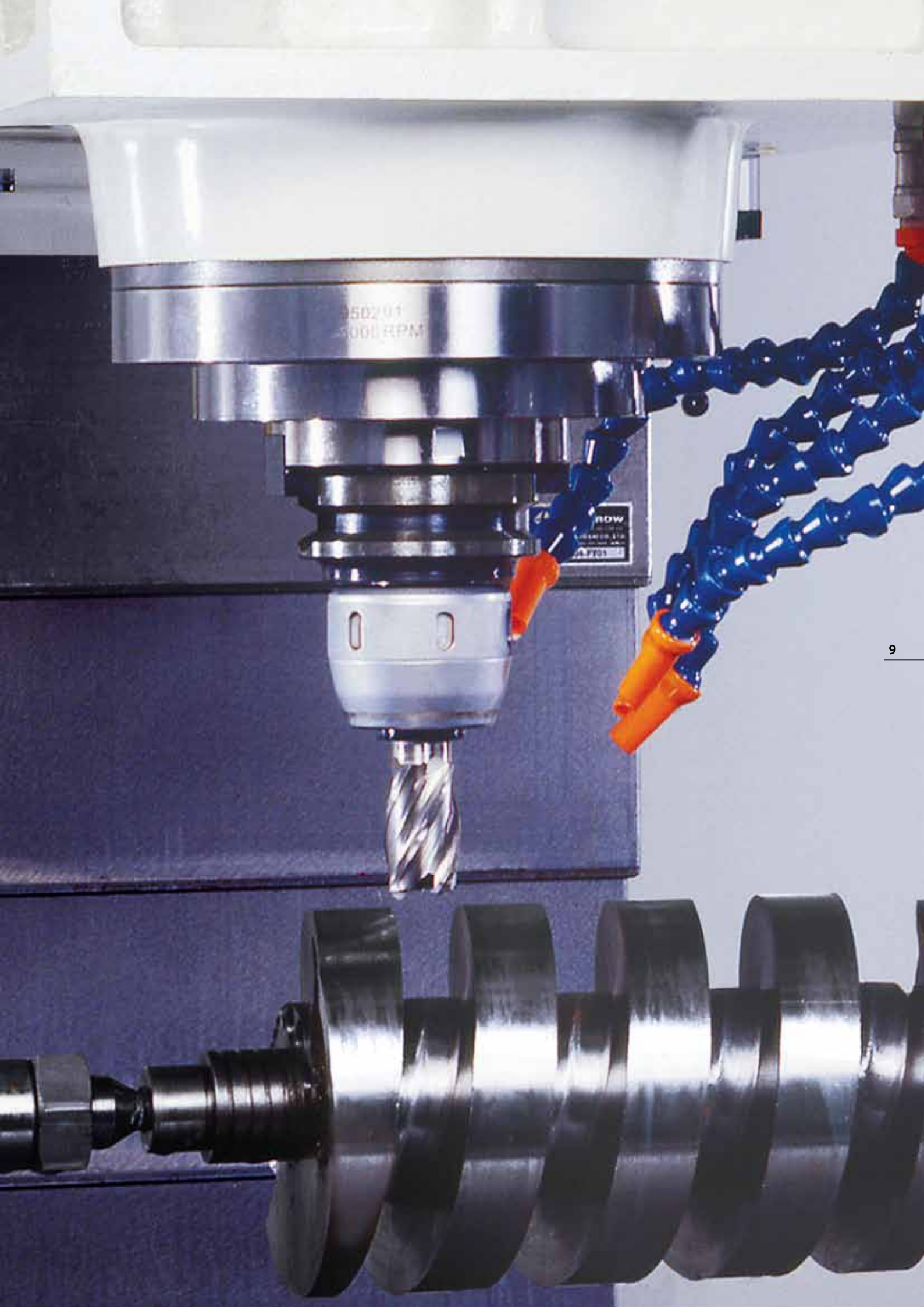
Machining Capacity

Machine: QP4088

Spindle: Gear 18.5kW



Item / Tool Specifications		Face mill	End mill	Drill	Tap
Material		S45C	S45C	S45C	S45C
Tool Edges		8	6	2	4
Tool Dia.	mm	150	32	50	M42 x 4.5P
Spindle	rpm	375	375	200	120
Cutting Speed	M/min	176.6	37.7	31.4	15.8
Cuting (W x H)	mm	120 x 7	25 x 25	30 Deep	35 Deep
Feed Rate	mm/min	900	750	100	540
Cutting Capacity	c.c.	756	468.75	196	-



High Performance Vertical Machining Center

Double Arm Type Rapid ATC Mechanism

- Arm-type automatic tool changer and roller gear cam-type tool changing mechanism are driven by an electrical motor, which reinforces the high speed, accuracy and reliability.
- Tool magazine employs dual direction tool path selection.

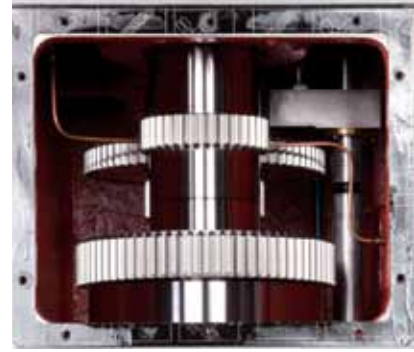


QP3560: (W) 4,300 x (L) 3,931mm

Note: Machine shown with fully enclosed splash guard.

Heavy-Duty Gear Type Headstock (Opt.)

- 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 $\varnothing 90\text{mm}$ ($\varnothing 3.54''$), which is very stiff and suitable for heavy-duty machining.
- With a 30HP-spindle motor and a two-speed transmission system, full power can be obtained at the low speed of 345. It provides larger torque for heavy-duty machining, and reaches a high speed of 6,000 for light metal machining.
- A highly efficient oil cooler 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 gearbox. This outstanding cooling system reduces thermal strain to a minimum and upgrades machining accuracy.



Big Diameter Precision Ballscrew

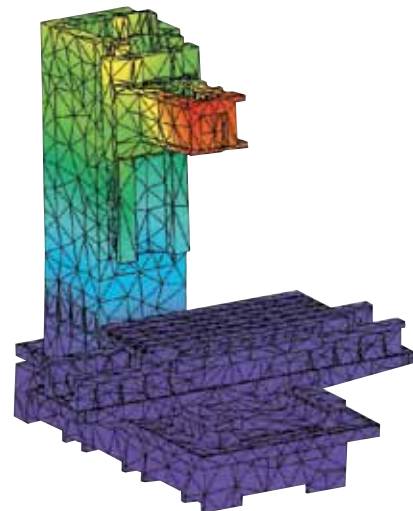
- All 3-axes employ C3 high precision ballscrews with a big diameter of $\varnothing 50\text{mm}$ ($\varnothing 2''$), which is associated with preloaded double nuts to ensure the least backlash.
- Ballscrews are supported by Class 7(P4) 60° angular contact thrust ball bearings, which ensures high accuracy.
- Pre-tensioned ballscrews reduce thermal deflection.
- Ballscrews and a servomotor are connected by flexible couplings, which ensure high transmission efficiency and minimum backlash.



For QP4088 only

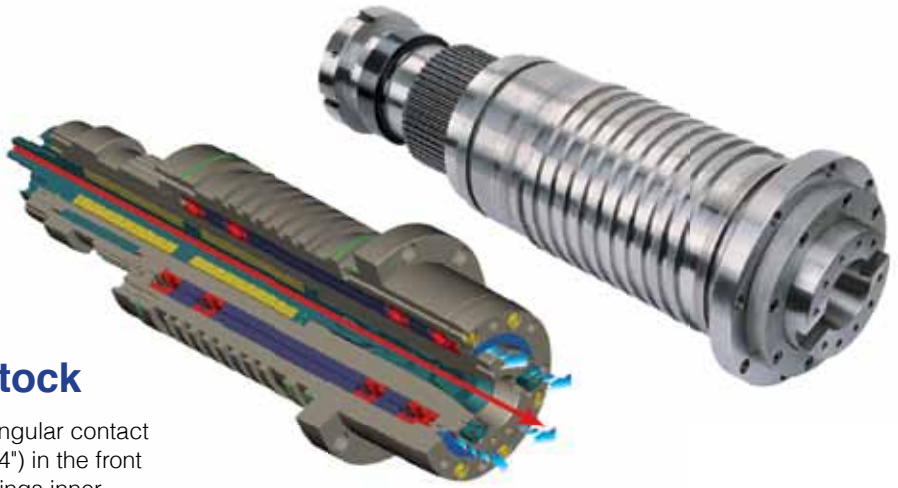
Quick Floating Type Tool Release System

- Floating-type configuration is employed in the tool unclamping mechanism, so that the unclamping force of 5,000kg (11,000 lbs.) is supported by the main structure of the spindle, not by the bearing, to increase the bearing's life.



3D Integrated Design and Finite Elements Analysis

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



Belt-Type Spindle Headstock

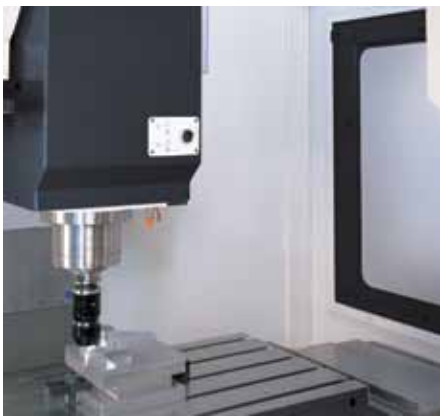
- The spindle is supported by 4 Class 7(P4) angular contact ball bearings, inner diameter $\varnothing 90\text{mm}$ ($\varnothing 3.54''$) in the front and 2 Class 7(P4) angular contact ball bearings inner diameter $\varnothing 80\text{mm}$ ($\varnothing 3.15''$) in the back.
- With a high torque 20HP AC spindle motor, the spindle speed is up to 6,000 (Opt. 8,000), which allows heavier machining at low speeds and light machining at high speeds.
- A highly efficient oil chiller is installed in the spindle to control the temperature and reduce the thermal deformation.
- Enforced timing belts are used for transmission, which results in high efficiency, slip-free movement, and easy maintenance.

20Bar~70Bar Coolant-Through-Spindle System (Opt.)

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

Machine Accessory

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Workpiece measurement (Opt.)

Air Cooled electrical cabinet (Opt.)

- Efficiently eliminate the heat from inside of the electrical cabinet, keeping the cabinet clean and dry, results a stable and reliable electrical components, prolong the longevity of electrical system.



Tool measurement (Opt.)



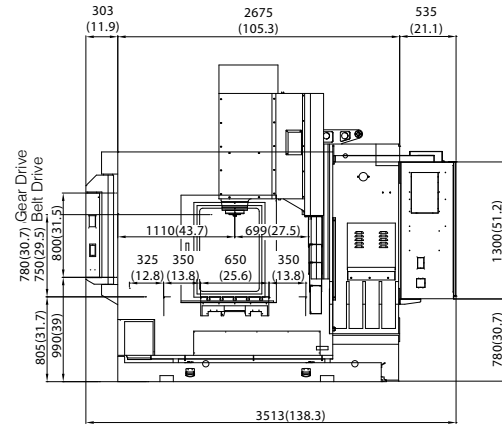
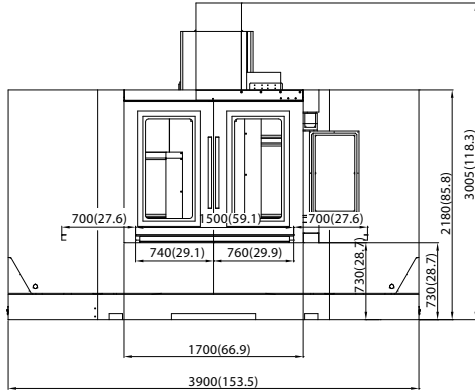
Chain Type

Arm Type

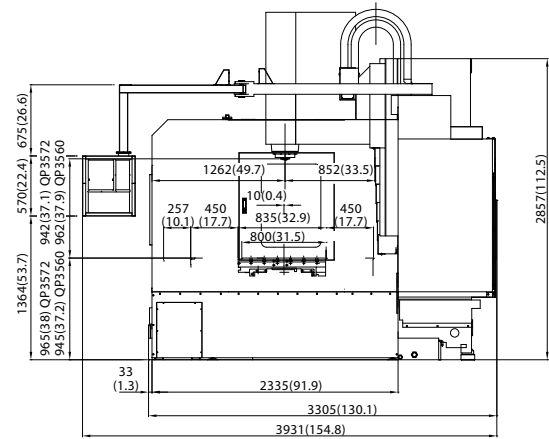
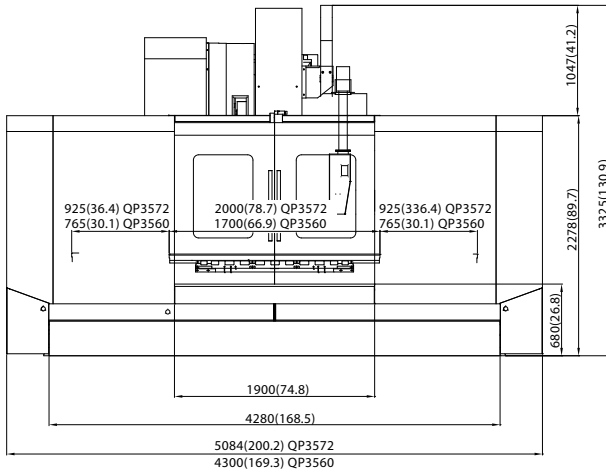
Dimensional Drawings

UNIT : mm (")

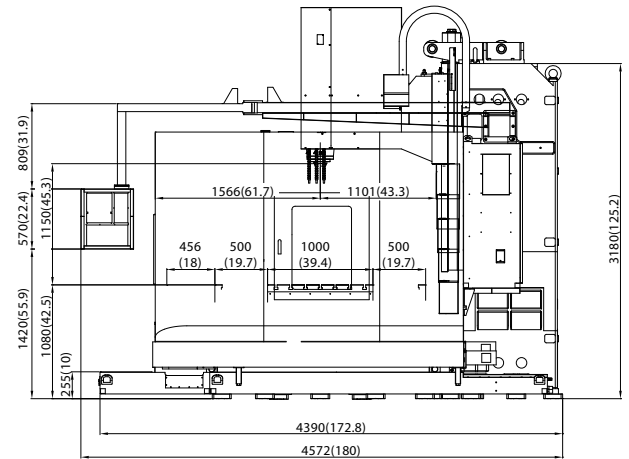
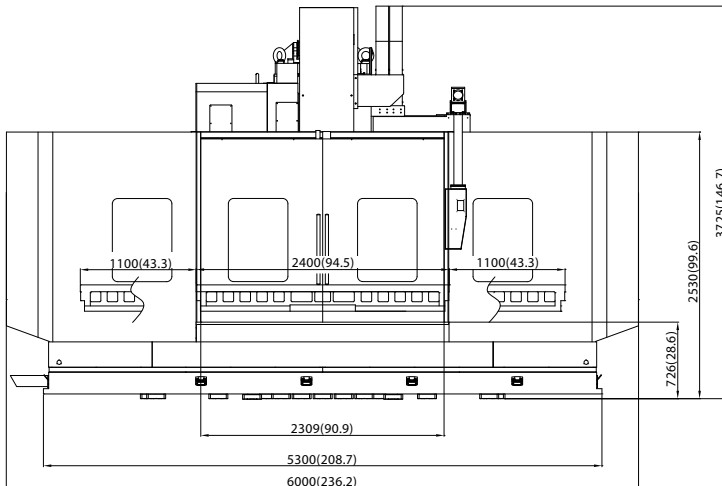
QP2855 (Full cover)



**QP3572 (Full cover)
QP3560 (Full cover)**



QP4088 (Full cover)



QP Series Vertical Machining Centers Specifications

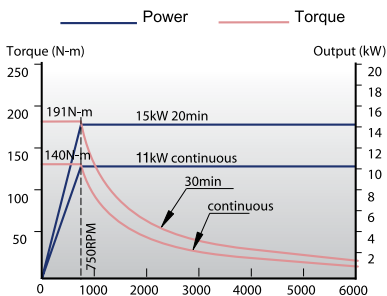
Description			QP2855		
Capacity	Max. workpiece weight	kg (lbs.)	1,600 (3,250)		
	Machining capacity (L x W x H)	mm (")	1,400 x 690 x 750 (55.1 x 27.2 x 29.5)	1,400 x 690 x 780 (55.1 x 27.2 x 30.7)	
	Height from the table to surface ground	mm (")	850 (33.5)		
Table	Table size	mm (")	1,500 x 650 (59.1 x 25.6)		
	T-slots (wid x dis x no.)	mm (")	18 x 125 x 5 (0.7 x 4.9 x 5)		
Stroke	X-axis stroke	mm (")	1,400 (55.1)		
	Y-axis stroke	mm (")	700 (27.6)		
	Z-axis stroke	mm (")	600 (23.6)		
Spindle	Spindle speed	rpm	8,000 Belt Drive (Opt. 10,000 / 1,2000)	6,000 Belt Drive (Opt. 8,000)	6,000 Gear Drive
	Spindle taper		#40	#50	#50
	Spindle nose to table surface	mm (")	150~750 (5.9~29.5)		180~780 (7.1~30.7)
Feed rates	X-axis rapid traverse	m/min (fpm)	15 (49)		
	Y-axis rapid traverse	m/min (fpm)	15 (49)		
	Z-axis rapid traverse	m/min (fpm)	15 (49)		
	Cutting teed (X / Y / Z)	m/min (fpm)	1~7 (3.3~23)		
	X / Y / Z axes ball screw diameter	mm (")	Ø50 / Ø50 / Ø40 (Ø2 / Ø2 / Ø1.6)		Ø50 / Ø50 / Ø45 (Ø2 / Ø2 / Ø1.8)
Automatic tool changer	Tool shank		BT40 / CT40 / DIN40	BT50 / CT50 / DIN50	
	Pull stud		P40T-1	P50T-1	
	Tool storage capacity		24+1 Opt.32		
	Max. tool dia. with adjacent tool	mm (")	80 (3.1)	127 (5) Opt. 32T 125 (4.9)	
	Max. tool dia. without adjacent tool	mm (")	150 (5.9)	150 (5.9) Opt. 32T 250 (9.8)	
	Max. tool length	mm (")	300 (11.8)	300 (11.8) Opt. 32T 300(11.8)	
	Max. tool weight	kg (lbs.)	7 (15.4)	15 (33)	
	Tool selection system		Random tool selection mode		
	Tool change time (tool-to-tool)	sec.	1.8	5	5
	Tool change time (chip-to-chip)	sec.	5	8	8
Motors	Spindle motor	kW	7.5 / 11	11 / 15	18.5 / 22
	Axis motors (X / Y / Z)	kW	3 / 3 / 4	4 / 4 / 4	
Power requirement	Power required	KVA	35		
	Compressed air supply	Pressure	kg/cm2 5.5		
		Flow	NL/min. 200		
Tank Capacity	Coolant tank capacity	L	350		
Machine dimensions	Machine height (H)	mm (")	3,005 (118.3)		
	Required floor space (W x L)	mm (")	3,900 x 3,513 (153.5 x 138.3)		
	Machine weight	kg (lbs.)	9,100 (20,020)		
Accuracy	Positioning accuracy (X / Y / Z)	mm (")	0.015 / 0.012 / 0.012 (0.0006 / 0.0005 / 0.0005)		
	Repeatability accuracy (X / Y / Z)	mm (")	0.012 / 0.008 / 0.008 (0.0005 / 0.0003 / 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.

Spindel Torque Chart

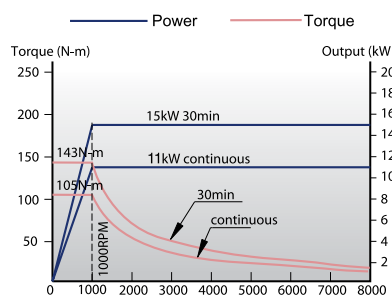
6,000 Belt Drive

FANUC α p22 (15kW) Spindle Motors



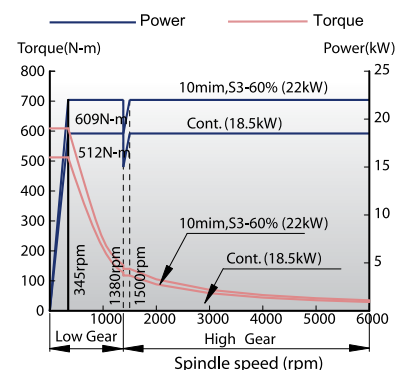
8,000 Belt Drive

FANUC α p22 (15kW) Spindle Motors



6,000 Gear

FANUC α 18i (22kW) Spindle Motors



UNIT : mm (")

Standard / Optional Accessories

QP3560	QP3572	QP4088
2,500 (5,500)	2,500 (5,500)	3,500 (7,700)
1,530 x 835 x 962 (60.2 x 32.9 x 37.9)	1,850 x 835 x 942 (72.8 x 32.9 x 37.1)	2,200 x 1,000 x 1,150 (86.6 x 39.4 x 45.3)
965 (38)	965 (38)	1,035 (40.7)
1,700 x 800 (66.9 x 31.5)	2,000 x 800 (78.7 x 31.5)	2,400 x 1,000 (94.5 x 39.4)
18 x 125 x 6 (0.7 x 4.9 x 6)	18 x 125 x 6 (0.7 x 4.9 x 6)	22 x 140 x 7 (0.9 x 5.5 x 7)
1,530 (60.2)	1,850 (72.8)	2,200 (86.6)
900 (35.4)	900 (35.4)	1,000 (39.4)
762 (30)	762 (30)	1,000 (39.4)
6,000 Belt Drive (Opt.8,000)		
6,000rpm Gear Drive		
#50		
200~962 (7.9~37.9)	180~942 (7.1~37.1)	150~1,150 (5.9~45.3)
15 (49)		12 (39.4)
15 (49)		12 (39.4)
	12 (39.4)	
	1~7 (3.3~23)	
	Ø50 (Ø2)	Ø63 (Ø2.5)
BT50 / CT50 / DIN50		
P50T-1		
24+1		
Opt.32		
105 (4.1) Opt. 32T 127 (5)		
200 (7.9) Opt. 32T 229 (9)		
300 (11.8)		
15 (33)		
Random tool selection mode		
5		
8		
Belt Drive: 11 / 15		
Gear Drive: 18.5 / 22		
4 / 4 / 4		7 / 9 / 7
35		50
5.5		
200		
300 (Half cover) / 400 (Full cover)		450
3,325 (130.9)		
4,300 x 3,931 (169.3 x 154.8)	5,084 x 3,931 (200.2 x 154.8)	6,000 x 4,572 (236.2 x 180)
14,790 (32,538)	15,290 (33,638)	26,000 (57,200)
0.016 / 0.014 / 0.014 (0.0007 / 0.0006 / 0.0006)		0.022 / 0.015 / 0.015 (0.0009 / 0.0006 / 0.0006)
0.012 / 0.010 / 0.010 (0.0005 / 0.0004 / 0.0004)		0.016 / 0.012 / 0.012 (0.0007 / 0.0005 / 0.0005)
ISO 230-2 / VDI 3441		

	QP2855	QP3560	QP3572	QP4088
FANUC 0iMD Controller	●	●	●	●
8.4 LCD	●	●	●	●
24 Tool ATC	●	●	●	●
32-station chain type tool magazine	◎	◎	◎	◎
Spindle air curtain system	●	●	●	●
Spindle air blast	●	●	●	●
Air blast chip blower	●	●	●	●
Chain type chip conveyor on Y-axis	◎			
Lift-up chip conveyor for fully enclosed splash guard		◎	◎	◎
Screw type chip conveyor on X-axis	◎	◎	◎	●
Rear chip flash system	●	●	●	●
Work light	●	●	●	●
Pilot light	●	●	●	●
Fully enclosed splash guard	●	◎	◎	◎
Table splash guard		●	●	
High semi enclosed splash guard				●
Water tank	●	●	●	●
Auto lubrication system	●	●	●	●
MPG Handle wheel	●	●	●	●
Leveling bolts and pads	●	●	●	●
Bolt kit with tools for foundation	●	●	●	●
Tool box with tools	●	●	●	●
Operation manual	●	●	●	●
Rigid tapping	●	●	●	●
RS232 Interface	●	●	●	●
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	◎	◎	◎	◎
#40 10,000 / 12,000rpm belt drive spindle	◎			
#50 8,000rpm belt drive spindle	◎	◎	◎	◎
#50 6,000rpm gear type spindle	◎	◎	◎	◎
Spindle / gear head oil chiller	◎(40#) ●(50#)	●	●	●
Through spindle coolant system (20Bar~70Bar)	◎	◎	◎	◎
Linear scale	◎	◎	◎	◎
4th axis preparation	◎	◎	◎	◎
4th axis CNC rotary table	◎	◎	◎	◎
Auto tool length measurement system	◎	◎	◎	◎
Auto workpiece measurement system	◎	◎	◎	◎
Automatic power off	◎	◎	◎	◎
Water gun	◎	◎	◎	◎

● Standard Accessories, ◎Optional Accessories



Grinding

Grinding

Turning

Milling

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