JOHNFORD®

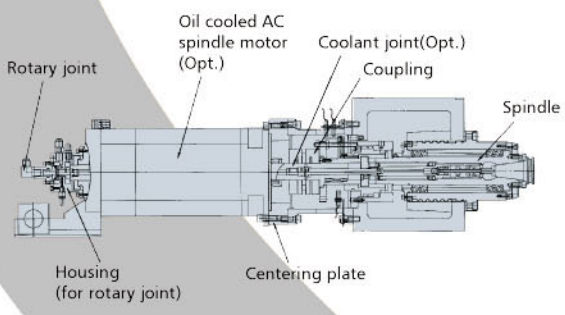
Super Vertical Machining Centers

SV-33/41/48
SV-33H/41H/48H

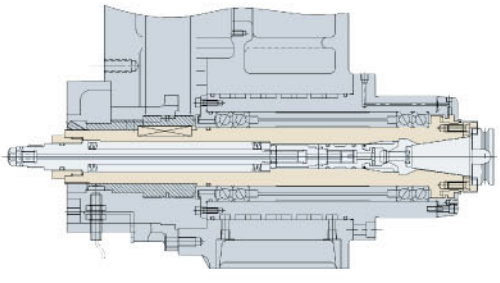
Super Vertical Machining Cente

Four Guideways on T
and Dynamic Accur
Rapid Traverse: X/Y /

SV-33 / 41



Direct Driving Spindle
Spindle taper: BBT-40
Spindle Speed: 15000 rpm



Cartridge Spindle
Spindle taper: BT / CAT / BBT
Spindle Speed: Std. 10000 rpm (No.40); 6000 rpm (No.50)
Opt. 12000 rpm (No.40); 8000/10000 rpm (No.50)

Item \ Model	
Table working surface	
Longitudinal travel (X)	
Cross travel (Y)	
Vertical travel (Z)	
Spindle motor (cont. / 30 min)	
Table load capacity	
Machine dimensions (LxWxH)	
Machine weight	

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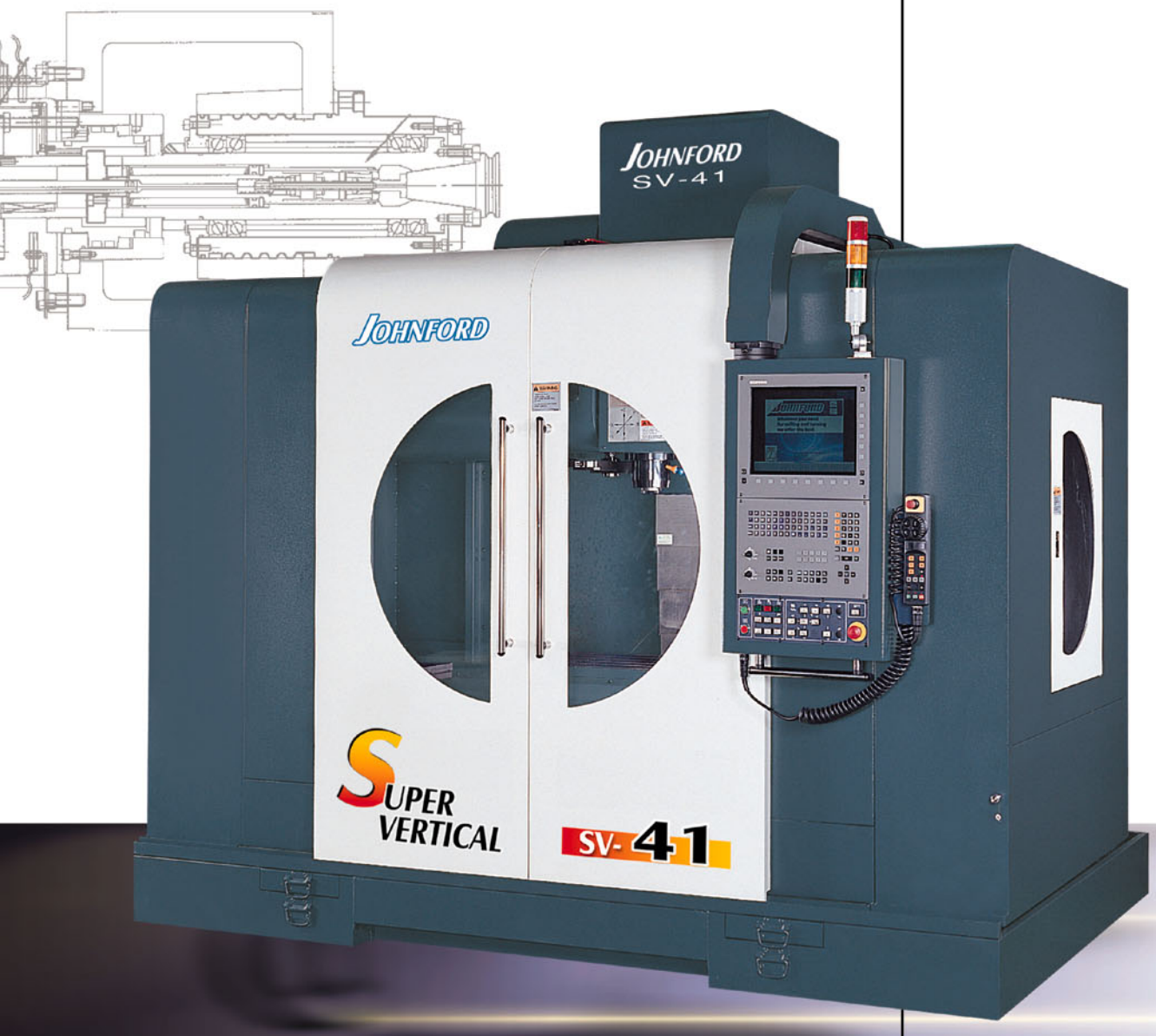
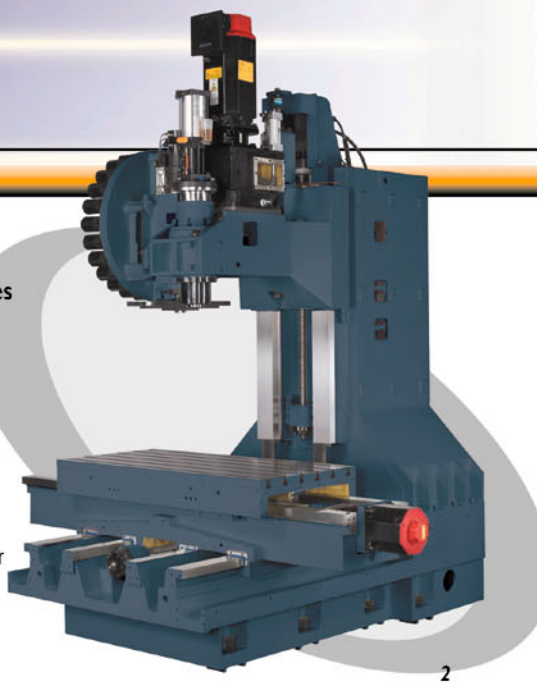


The Base for Rigid with Excellent Static
acy.
/Z 30/30/20 m/min Turcite-B on 3 Axes

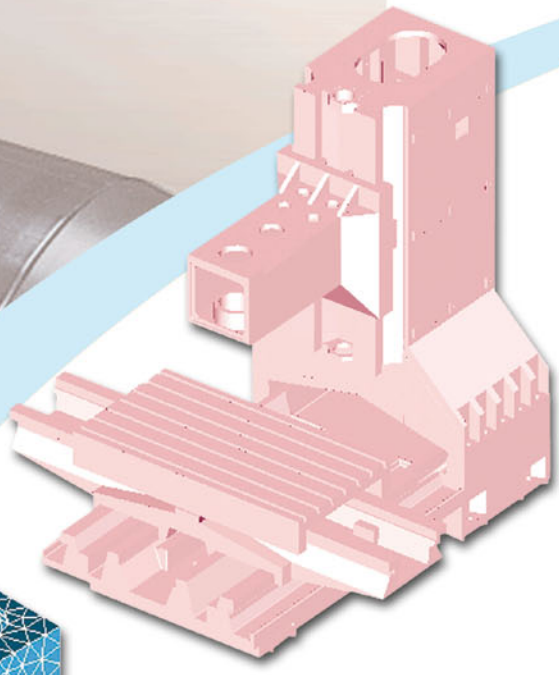
SV-33	SV-33H	SV-41	SV-41H
1000x600 mm (39.4"x23.6")		1200x600 mm (47.2"x23.6")	
850 mm (33.5")		1050 mm (41.3")	
610 mm (24")		610 mm (24")	
610 mm (24")		610 mm (24")	
9/11 kW P motor (Std.) 7.5/11 kW Hi-Lo Gear (Opt.)	11/15 kW Hi-Lo Gear box (Std.)	9/11 kW P motor(Std.) 7.5/11 kW Hi-Lo Gear (Opt.)	11/15 kW Hi-Lo Gear box (Std.)
1200 kg (2640 lb)			
2680x3420x2888 mm (105.5"x134.6"x113.7")	2680x3420x2978 mm (117.7"x134.6"x117.2")	2990x3420x2888 mm (117.7"x134.6"x113.7")	2990x3420x2978 mm (117.7"x134.6"x117.2")
6500 kg (14300 lb)	7000 kg(15400 lb)	7000 kg (15400 lb)	7500 kg (16500 lb)

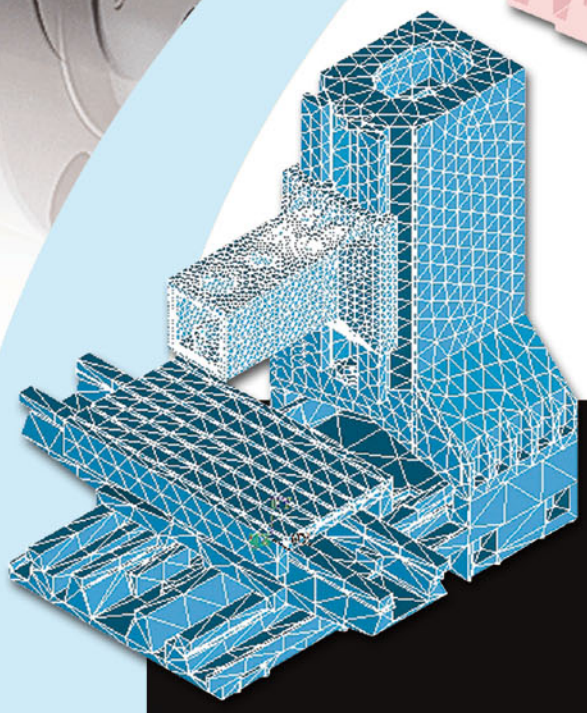


Super Advanced Features

- Water-cooled headstock
- No Offset gearbox
- Four guideways on the base
- Zero table overhang
- Hydraulic counter balance
- Y-axis rear mount for servo motor
- Direct driving ball screws
- Twin chip removal system

Super Vertical Machining Cente





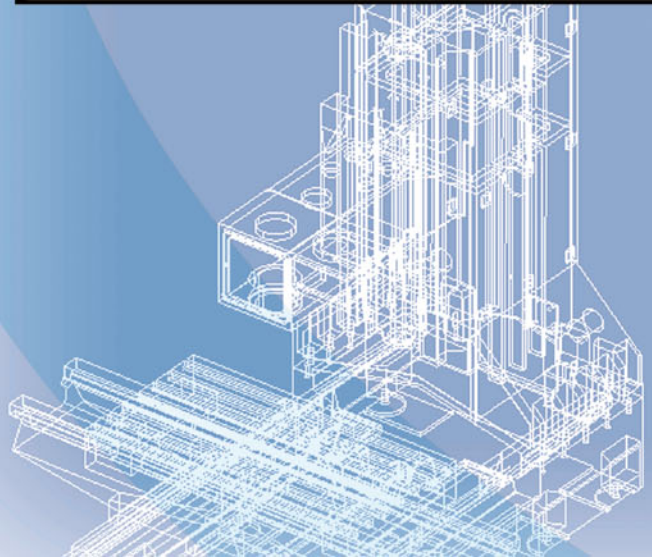
Optimal Structure Design

Built Right.....Built to Last JOHNFORD Super Verticals are built in classic style. Meehanite cast iron, cast extra heavy for rigidity and damping, precision ground ways induction hardened to 58-62Rc, and hand scraped turcite-B applied to all mating surfaces ensure fit, precision, and long term performance. It is the only way to do it ! Performance you see in your finishes and feel in your wallet.

The structures have been designed with finite element analysis (FEA).

- Four guideways on base
- Zero table overhang
- Turcite-B on 3 axes
- Rapid traverse X/Y/Z: 24/24/24 m/min.

SV-48 / 48H



Item / Model	
Table working surface	
Longitudinal travel (X)	
Cross travel (Y)	
Vertical travel (Z)	
Spindle motor (cont. / 30 min)	
Table load capacity	
Machine dimensions (LxWxH)	
Machine weight	

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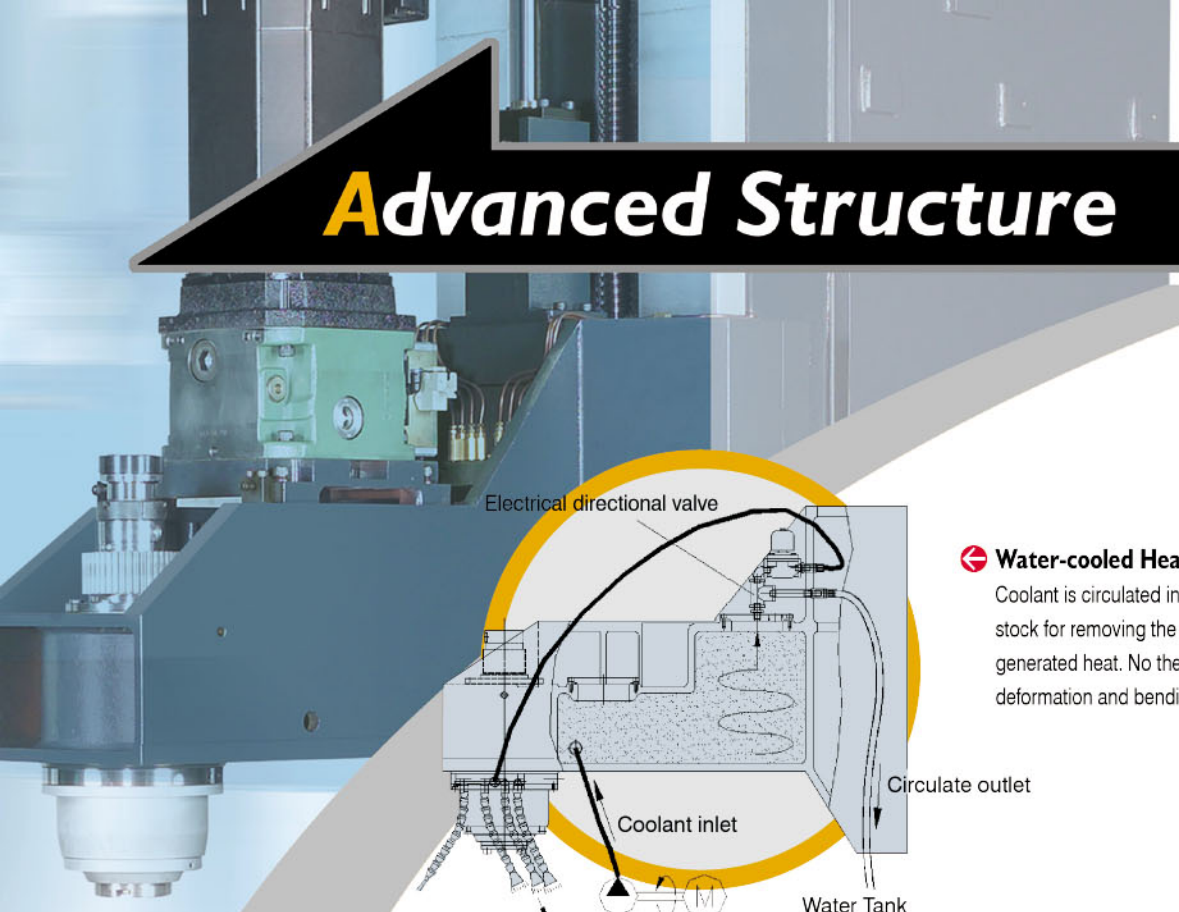
SV-48	SV-48H
1300x700 mm (51.2"x27.6")	1300x700 mm (51.2"x27.6")
1220 mm (48")	1220 mm (48")
710 mm (28")	710 mm (28")
630 mm (24.8")	630 mm (24.8")
7.5/11 kW (No. 40)	11/15 kW (No. 50)
1500 kg (3300 lb)	1500 kg (3300 lb)
3200x3900x3090 mm (126"x154"x122")	3200x3900x3090 mm (126"x154"x122")
9500 kg (20900 lb)	10000 kg (22000 lb)

High Performance Cartridge Spindle

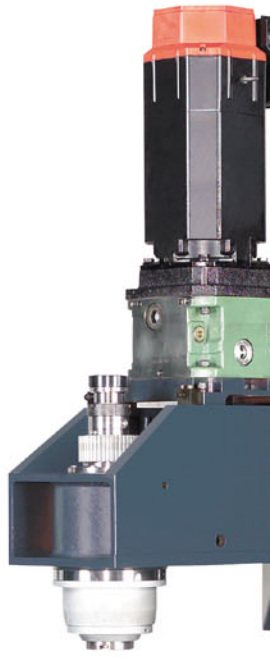
- With all of that torque, machines have to have a great spindle. These are spindles flexible enough for high-torque, heavy-duty cutting, and high-speed machining operation.

Advanced Structure



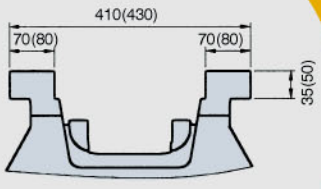
Water-cooled Headstock

Coolant is circulated in the head stock for removing the spindle-generated heat. No thermal deformation and bending



No Off-set Gearbox

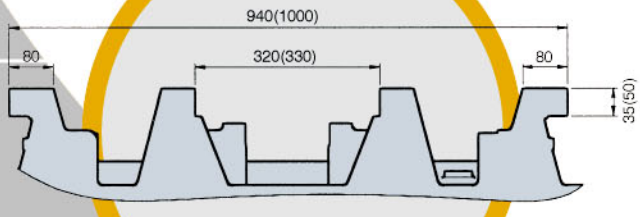
All the mechanical structures on the head stock are symmetrical on the Z-axis centerline without an off-set gearbox. It means the Z-axis movement is steadier and the torsion on the head stock is smaller.



Saddle ( ) for SV-48

Zero Table Overhang

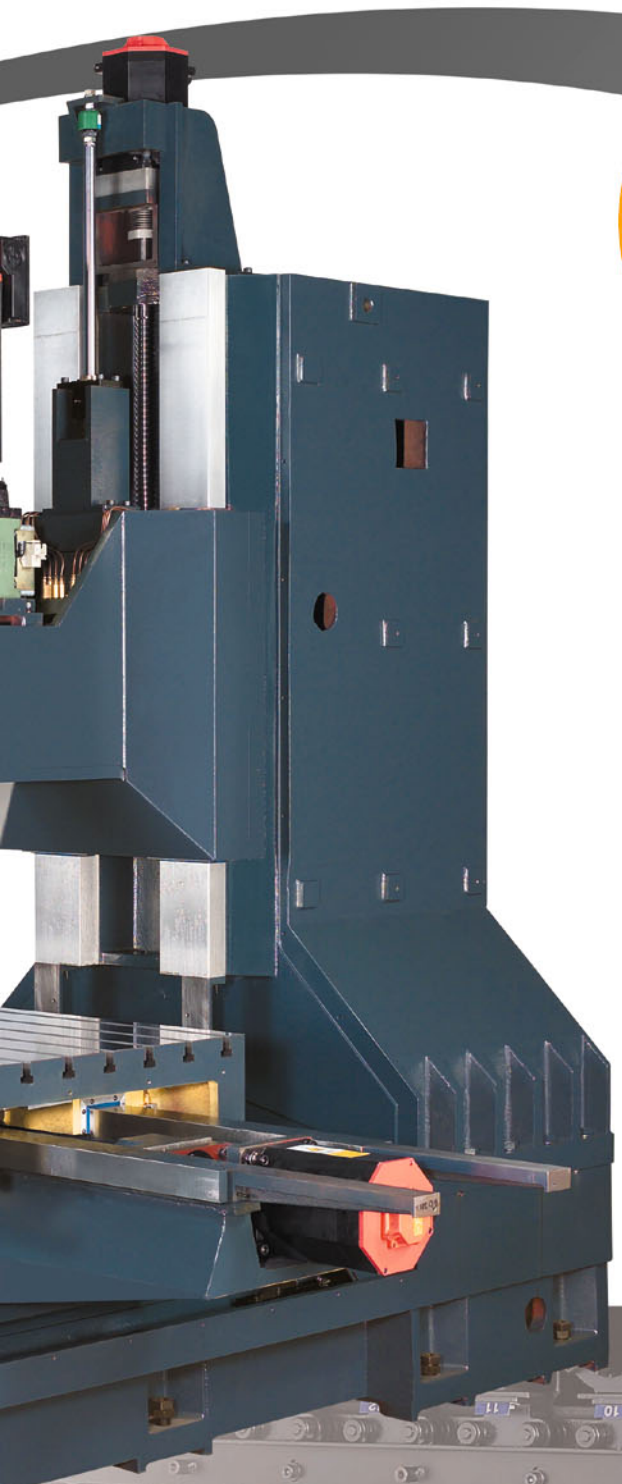
- Super wide guide way arrangement allows the weight of the table and the work piece to be kept within the travel of saddle.
- Super wide guide way arrangement provides rigidity and accuracy.

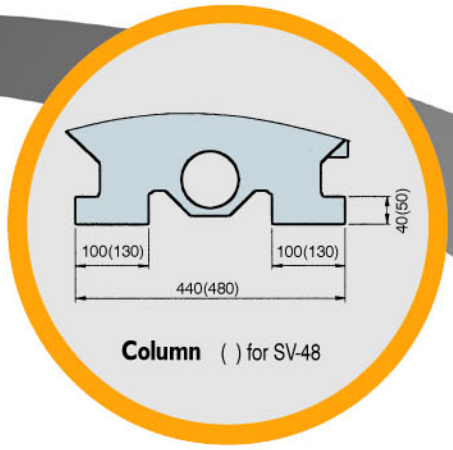


Base ( ) for SV-48

Four Guideways on Base

- Solid box way construction with 24m/min rapid rates=speed and rigidity.
- Ultra rigid and heavy meehanite cast iron construction =dampening and strength.

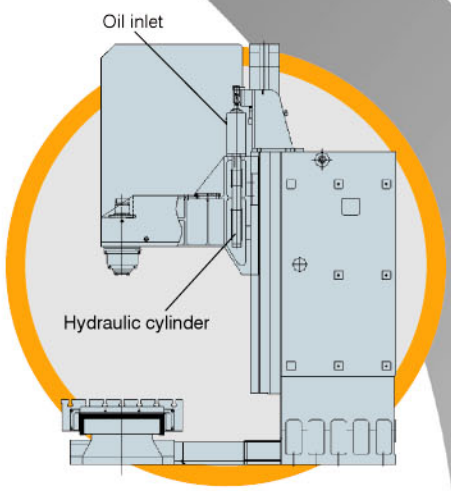


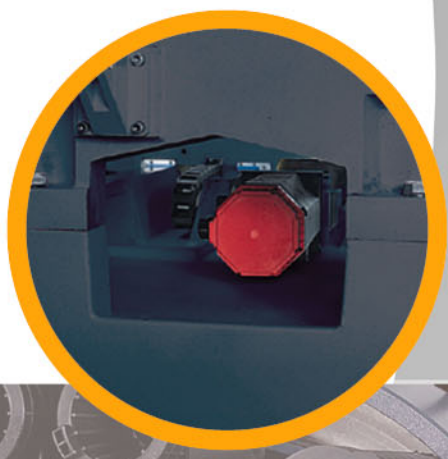


Column ( ) for SV-48

Hydraulic Counter Balance

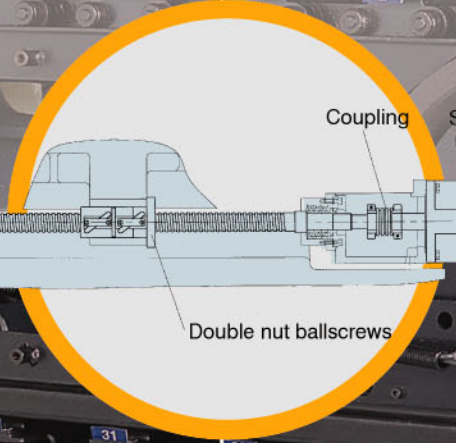
Hydraulic counter weight provides smooth Z axis movement in rapid traverse.





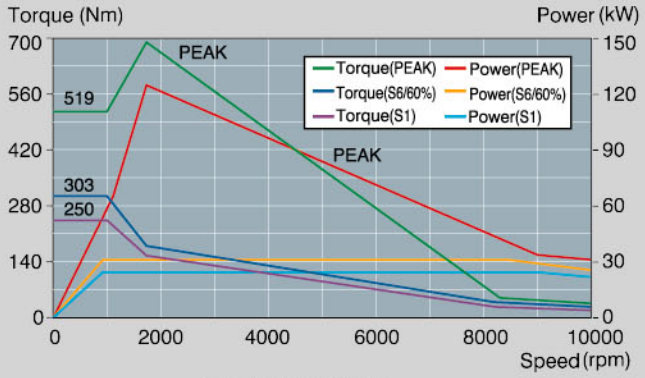
Direct Driving Ballscrews

Servo motors direct coupled to ballscrews=accuracy and precision. Oversized 40mm (1.57") pretensioned, double nut ballscrews in all 3 axes=no thermal growth and accuracy.

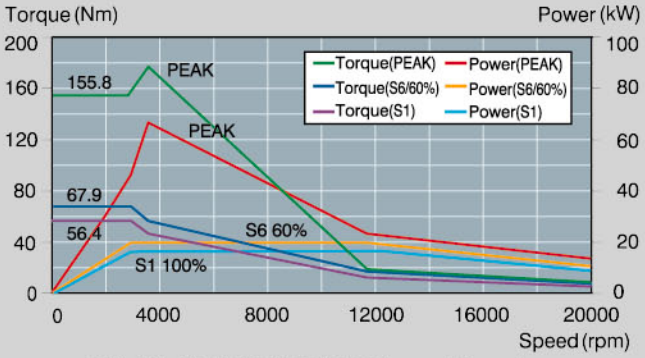


Spindle Power & Torque Chart

High Speed Spindle (Built-In Motor)(Opt.)



HSK A100 10,000 rpm

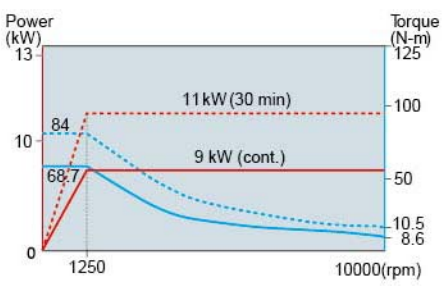


HSK A63 15,000/18,000/20,000 rpm (Grease)

Technical Data

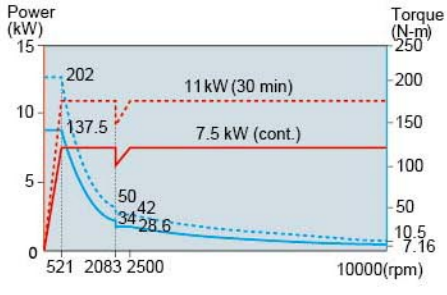
Drive Layout		
Tool system	HSK A63	HSK A100
Power (cont. / 30 min)	17 / 20 kW	26 kW
Nominal speed	2,880 rpm	992 rpm
Max. Torque	56.4 Nm	303 Nm
Max. Speed	20,000 rpm	10,000 rpm
Control	Fanuc / Siemens / Heidenhain	
Voltage	220V / 380V	400V
Max. Current	90 A / 54A	125 A
Driver	-	SPM-75 HVI
Clamping system	Spring-mechanical+ Power-mechanical	Hydro-mechanical
Clamping Force	18 kN	45 kN
Tool cleaning	Central + Surrounding	
Spindle bearings	2 x ϕ 70 Ceramic Balls	2 x ϕ 100 Ceramic Balls
Bearing rigidity	Sr 310.2 N/μm	680 N/μm
Bearing lubrication	Grease	
Spindle cooling	Water glycol	
Cooling performance	> 5 kW	> 7 kW
Cooling temperature	The same as machine	
Cooling volume approx	12 ℓ / min	15 ℓ/min
Internal coolant flow	Optional	Standard
Max. Pressure	70 bar	
Suitable for dry operation	Yes	
Air	Possible	
Min. quantities of cooling lubricant	Optional	-

Metal Removal Rate		Milling		Milling		Drilling		Threading	
Tool system		HSK A63	HSK A100	HSK A63	HSK A100	HSK A63	HSK A100	HSK A63	HSK A100
Power		17 kW	26 kW	17 kW	26 kW	17 kW	26 kW	17 kW	26 kW
Material		Steel 60-70 kg/mm^2		Aluminum 7075		Steel 60-70 kg/mm^2		Steel 60-70 kg/mm^2	
Machining volume	(cm^3/min)	300	577	1382	1770	259	-	-	
Tool/edges	(ϕ mm)	ϕ 50 / 4	ϕ 100 / 7	ϕ 80 / 7	ϕ 100 / 7	ϕ 30	ϕ 51	M24	M36
Rotational speed	(min^{-1})	2300	1146	6400	2107	2440	1435	500	330
Cutting speed	(m/min)	360		1615	662	230		37	
Cutting B x T	(mm)	40 x 4	80 x 4.5	60 x 3	80 x 5	-		-	
Feed	(mm/min)	1840	1604	7680	4425	366	287	500	1300



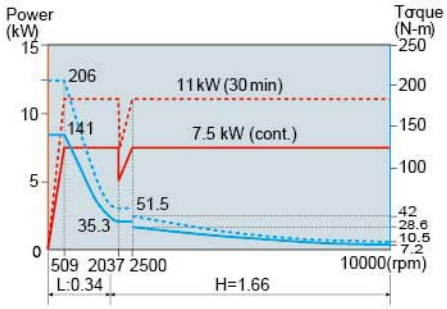
SV-33/41

■ 10000 rpm Cartridge Spindle (Std.)



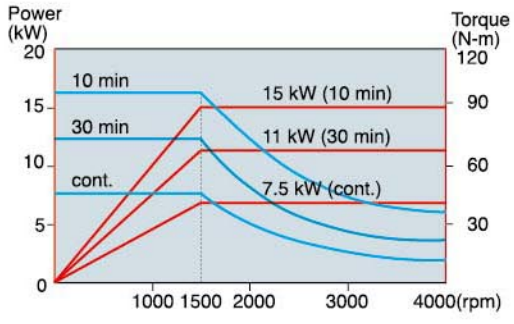
SV-33/41

■ 10000 rpm J.F gear box (Opt.)



SV-33/41

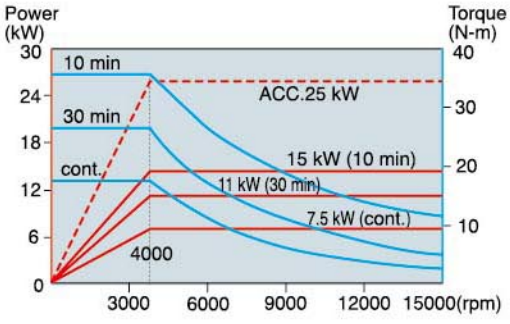
■ 10000 rpm planetary gear box (Opt.)



(Low winding)

SV-33/41

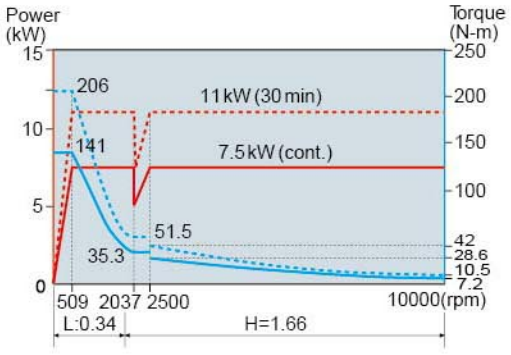
■ 15000 rpm motor direct drive spindle (Opt.)



(High winding)

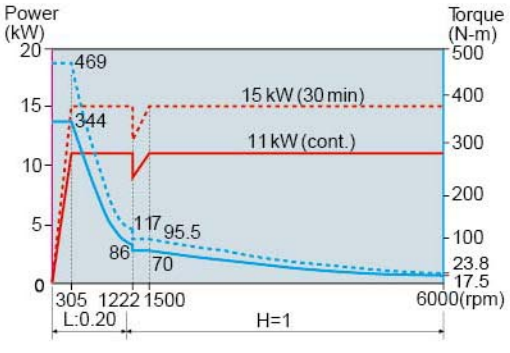
SV-33/41

■ 15000 rpm motor direct drive spindle (Opt.)



SV-48: (No.40)

■ 10000 rpm planetary gear box (Std.)

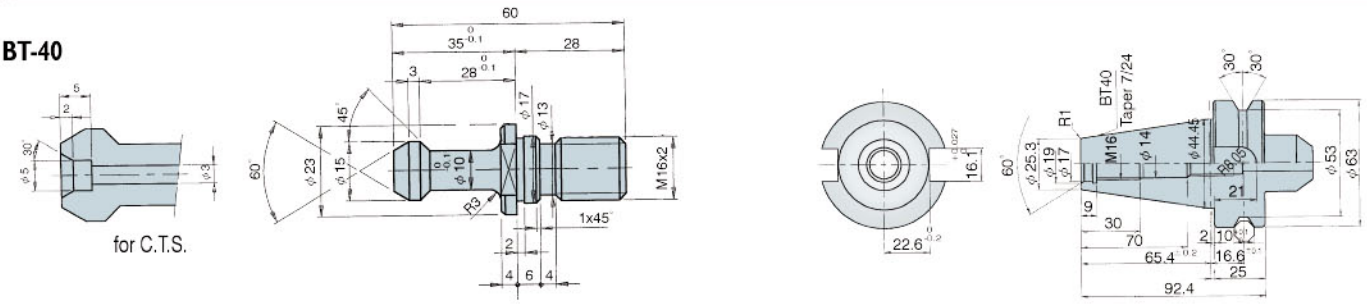


SV-33H / SV-41H / SV-48H: (No.50)

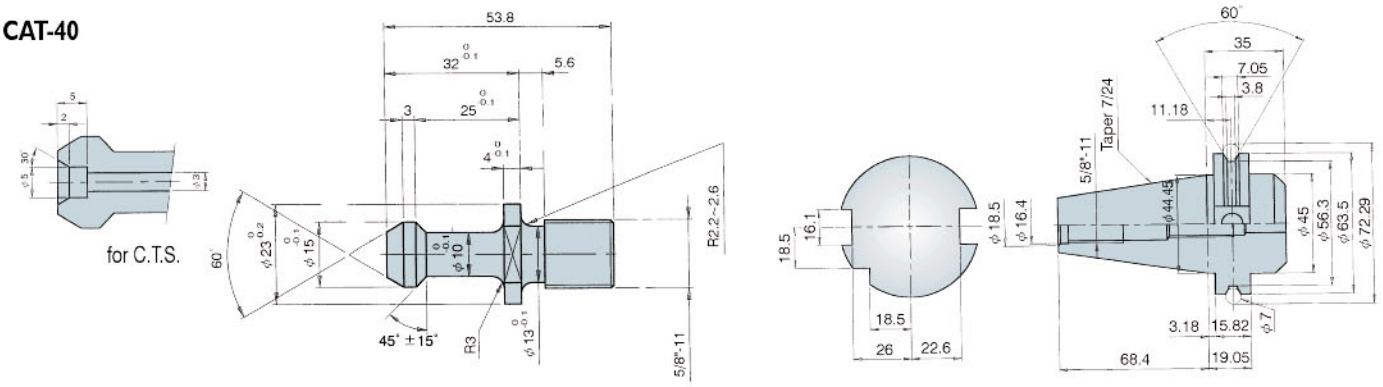
■ 6000 rpm planetary gear box (Std.)

Tool System

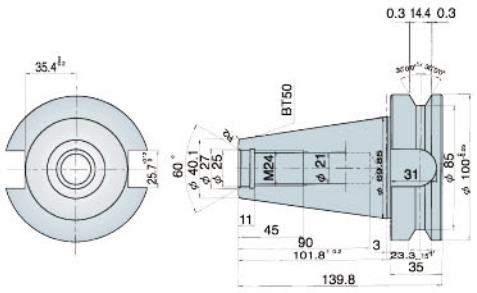
BT-40



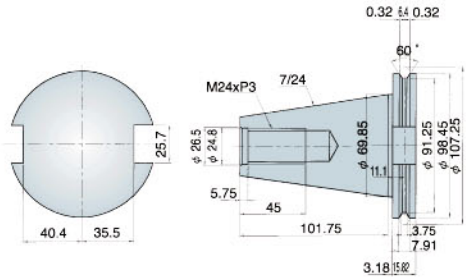
CAT-40



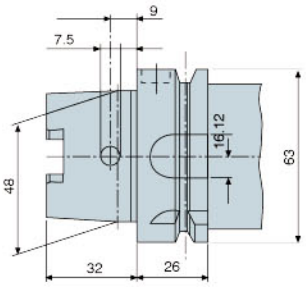
BT-50



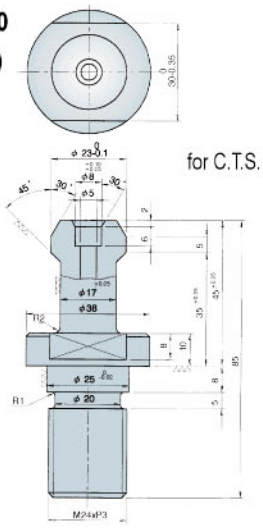
CAT-50



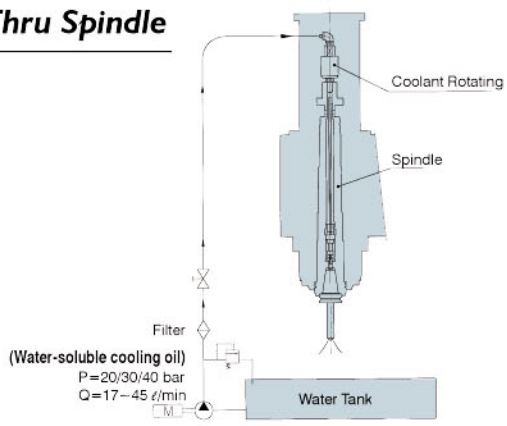
HSK-A63



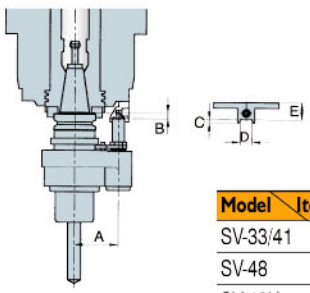
For BT-50/CAT-50 Tool shank (Std.)



Coolant Thru Spindle



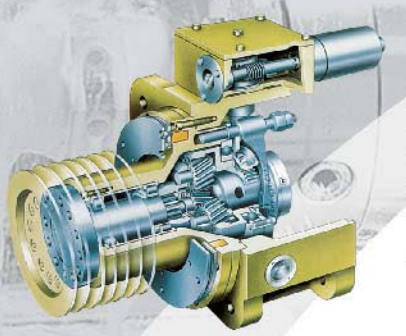
Coolant Thru Tool Tip



Model \ Item	Taper No.	A	B	C	D	E
SV-33/41	No.40	65	8	5	18	18
SV-48	No.40	65	9	5	18	25.5
SV-48H	No.50	80	7.5	5	18	36.5

Different Accessories for Your Choice

Gear Box



- Delivers high torque.
- Planetary gear box
- No noise generated.
- No heat transmitted.
- No gear vibration.
- High efficiency (over 95%)

Cooler

- High efficiency.
- Powerful cooling performance.

ATC Units

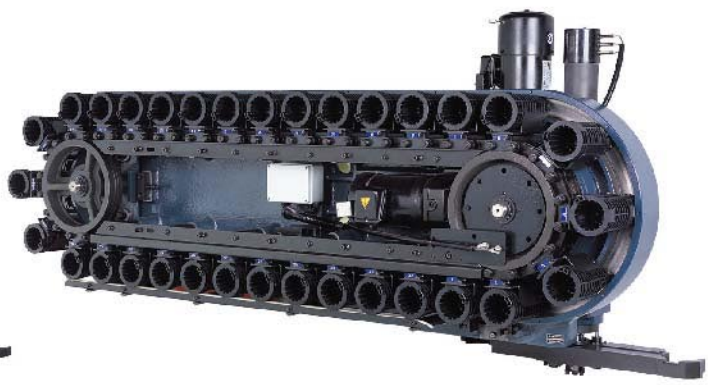
Armless Type

(Only moves on Z-axis for tool changing)

- 24 tools for BT/CAT-40
- 20 tools for BT/CAT-50

Arm Type

- 24 tools for
  BT / CAT / BBT-40, HSK A63
  BT / CAT / BBT-50, HSK A100



Arm Type

- 32 tools for
  BT / CAT / BBT-40, HSK A63
  BT / CAT / BBT-50, HSK A100

Standard Features-Great Equipment

Rigid tapping

High pressure coolant
(P:3.5 kg/cm², Q:100 ℓ/min)

Automatic chip removal
(Screw type chip conveyor)

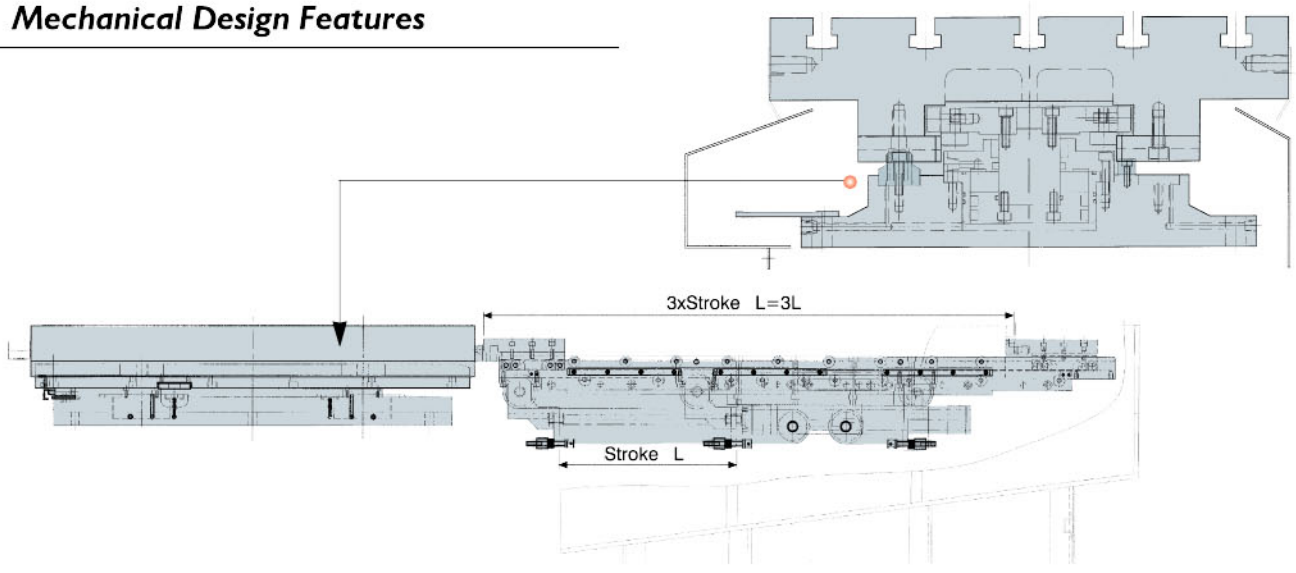
Remote handwheel

Automatic Pallet Changer

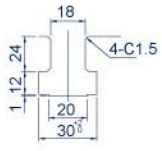
Chain Type (Patented)

JOHNFORD designed, built and integrated APC is the best you will find. Our side load twin Pallet system is fast, yet heavy duty. A complete pallet exchange takes only 15 seconds, yet our heavy mechanism provides plenty of beef for fixtures and a load of parts. Our pallets are made of cast iron and are available T-slotted or drilled and tapped. Our hydraulic clamping mechanism provides twin large diameter cylinders for clamping. The pallets locate on precision ground hardened steel pins and bushings. Repeatability is excellent at .0001" !

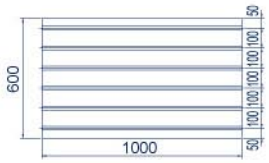
Mechanical Design Features



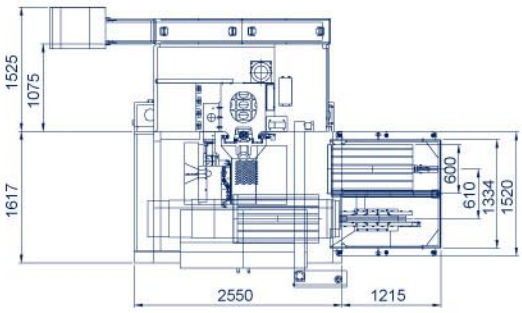
SV-33+APC Dimensions



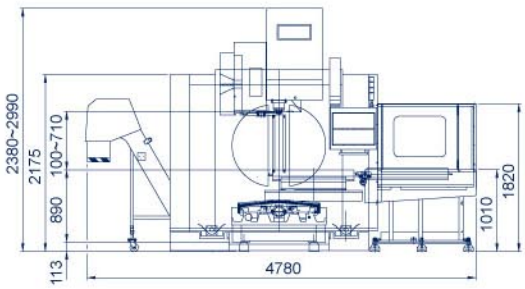
T-Slot



Table

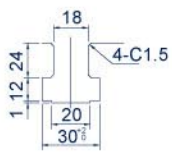


Top View (floor space required)

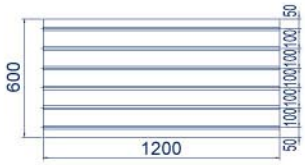


Front View

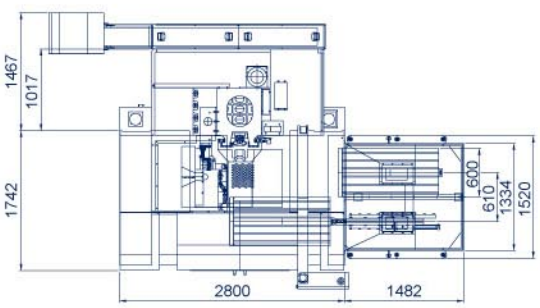
SV-41+APC Dimensions



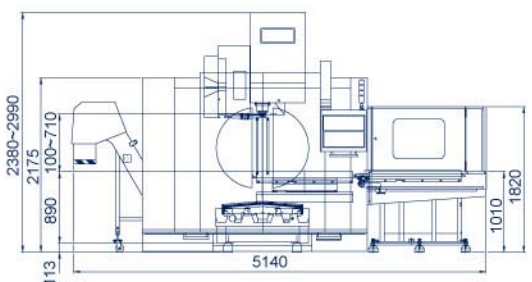
T-Slot



Table

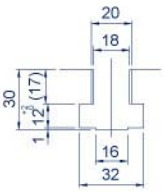


Top View (floor space required)

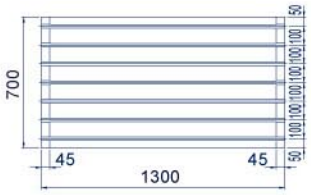


Front View

SV-48 / 48H+APC Dimensions



T-Slot



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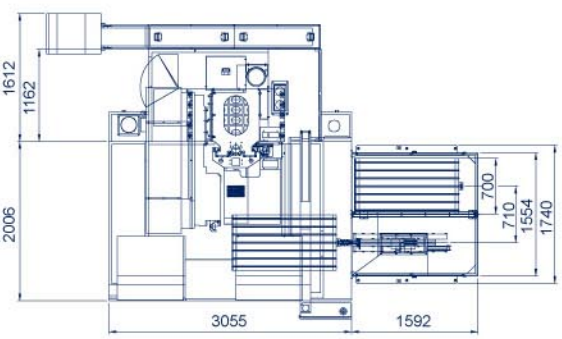
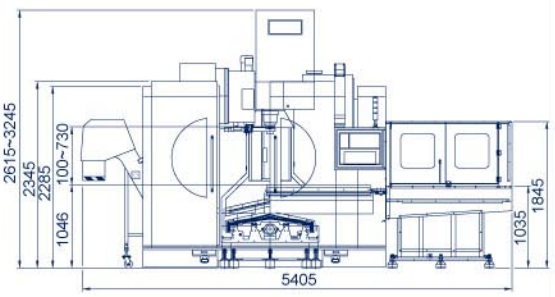


Top View (floor space required)

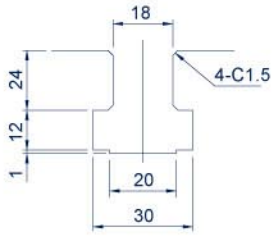


Front View

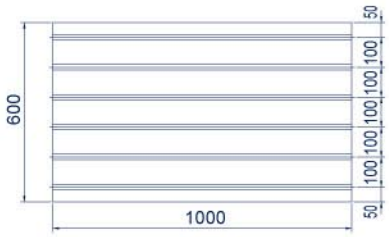
Dimensions

SV-33 / 33H

( ) For SV-33H



T-Slot



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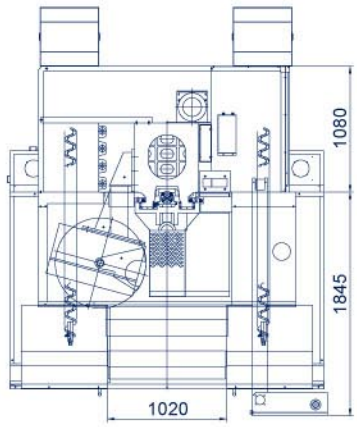
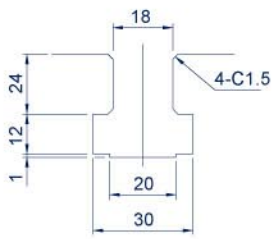


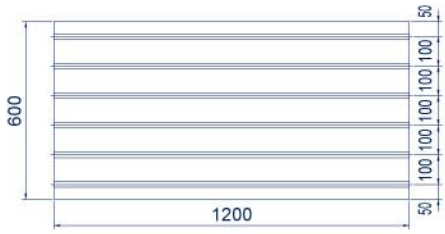
Top View (floor space required)

SV-41 / 41H

( ) For SV-41H



T-Slot



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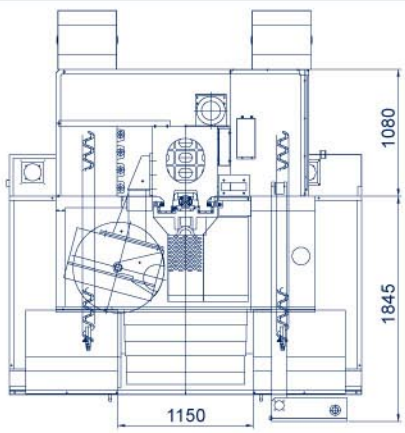
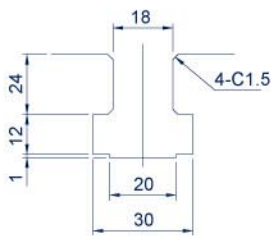
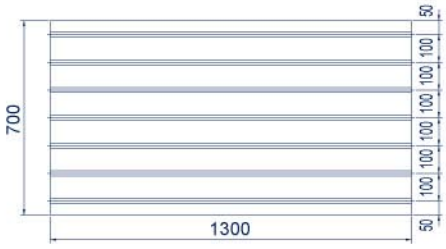


Top View (floor space required)

SV-48 / 48H



T-Slot



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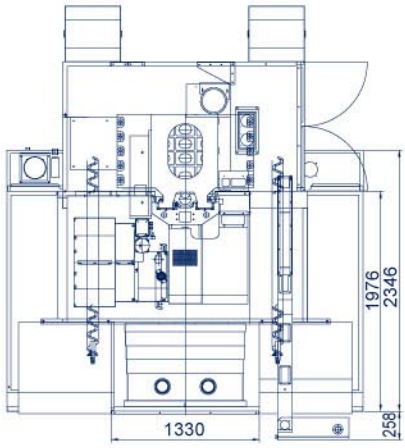
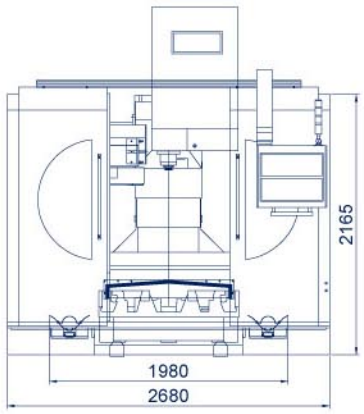
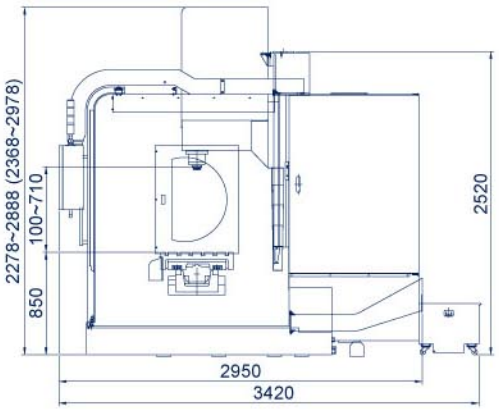


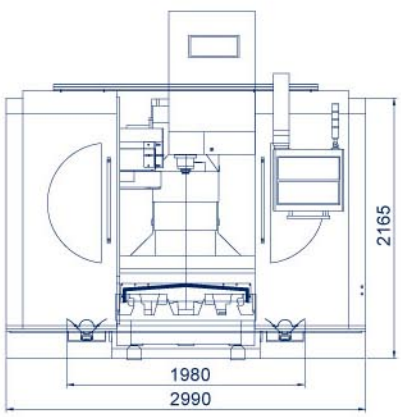
Top View (floor space required)



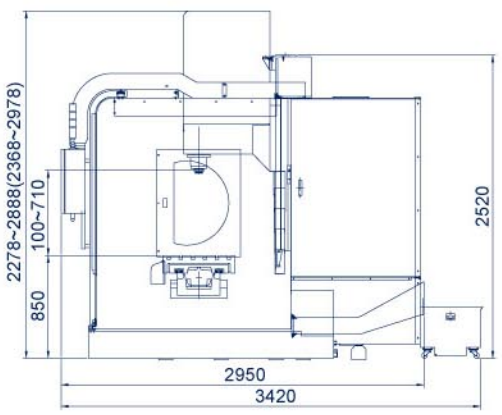
Front View



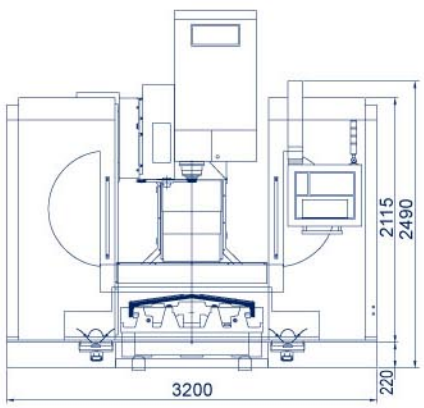
Side View



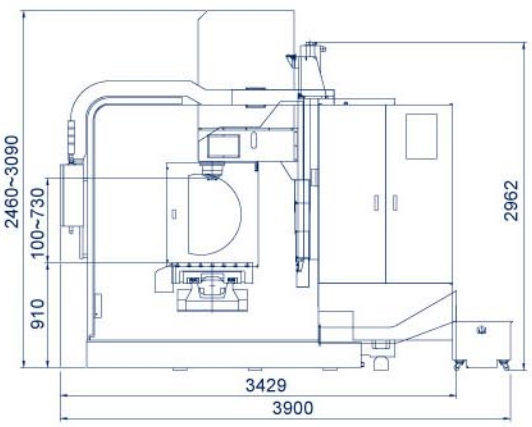
Front View



Side View



Front View



Side View

Specifications

Item		SV-33	SV-33H	SV-41	SV-41H	SV-48	SV-48H
Table working surface (mm)		1000 x 600 (39.4" x 23.6")		1200 x 600 (47.2" x 23.6")		1300x700 (51.2" x 27.6")	
Longitudinal travel (X) (mm)		850 (33.5")		1050 (41.3")		1220 (48")	
Cross travel (Y) (mm)		610 (24")				710 (28")	
Vertical travel (Z) (mm)		610 (24")				630 (24.8")	
Spindle nose to table (mm)		100~710 (3.94"~28")				100 ~ 730 (3.94"~28.7")	
Spindle to column (mm)		640 (25.2")				740 (29.1")	
Spindle speed & taper (rpm)	Std.	60~10000 (BT / CAT-40)	60~6000 (BT / CAT-50)	60~10000 (BT / CAT-40)	60~6000 (BT / CAT-50)	60~10000 (BT / CAT-40)	60~6000 (BT / CAT-50)
	Opt.	①Cartridge 12000 (BT/CAT/BBT-40) ②Direct drive 15000 (BBT-40) ③Built-in 15000/18000/ 20000 (HSK A63)	Cartridge 8000/10000 (BT/CAT/BBT-50)	①Cartridge 12000 (BT/CAT/BBT-40) ②Direct drive 15000 (BBT-40) ③Built-in 15000/18000/ 20000 (HSK A63)	Cartridge 8000/10000 (BT/CAT/BBT-50)	①Cartridge 12000 (BT/CAT/BBT-40) ②Direct drive 15000 (BBT-40) ③Built-in 15000/18000/ 20000 (HSK A63)	Cartridge 8000/10000 (BT/CAT/BBT-50)
Spindle motor (cont. / 30 min) (kW)	Std.	9 / 11 P motor	11 / 15 Hi-Lo Gear	9 / 11 P motor	11 / 15 Hi-Lo Gear	7.5 / 11 Hi-Lo Gear	11 / 15 Hi-Lo Gear
	Opt.	①7.5 / 11 Hi-Lo Gear (12000 rpm) ②7.5 / 11 (15000 rpm, BBT-40) ③17 / 20 (15000/ 18000/20000 rpm)	Power larger than 11 / 15 with Hi-Lo Gear	①7.5 / 11 Hi-Lo Gear (12000 rpm) ②7.5 / 11 (15000 rpm, BBT-40) ③17 / 20 (15000/ 18000/20000 rpm)	Power larger than 11 / 15 with Hi-Lo Gear	①7.5 / 11 Hi-Lo Gear (12000 rpm) ②7.5 / 11 (15000 rpm, BBT-40) ③17 / 20 (15000/ 18000/20000 rpm)	Power larger than 11 / 15 with Hi-Lo Gear
X-Y-Z Rapid traverse (m/min)		30-30-20				24-24-24	
Cutting feed (m/min)		1~12000					
Tool selection		Bi-direction random type, Shortest path					
No.of tools		Armless 24	Armless 20	Armless 24	Armless 20	Armless 24	Armless 20
		Arm type 24 / 32 (Opt.)				Arm type 24 / 32 (Opt.)	Arm type 24 / 32 (Opt.)
Max. tool diameter <Without adjacent tools> (mm)		75 (3") <100 (4")>	125 (5") <250 (9.8")>	75 (3") <100 (4")>	125 (5") <250 (9.8")>	75 (3") <100 (4")>	125 (5") <250 (9.8")>
Max. tool length (mm)		320 (12.6")	400 (15.7")	320 (12.6")	400 (15.7")	320 (12.6")	400 (15.7")
Max. tool weight (kg)		10 (22 lb)	15 (33 lb)	10 (22 lb)	15 (33 lb)	10 (22 lb)	15 (33 lb)
Table load capacity (kg)		1200 (2640 lb)				1500 (3300 lb)	
Machine weight (kg)		6500 (14300 lb)	7000 (15400 lb)	7000 (15400 lb)	7500 (16500 lb)	7000 (15400 lb)	7500 (16500 lb)
Machine dimensions (LxWxH) (mm)		2680 x 3420 x 2888 (105.5"x134.6"x113.7")	2680 x 3420 x 2978 (117.7"x134.6" x117.2")	2990 x 3420 x 2888 (117.7"x134.6"x113.7")	2990 x 3420 x 2978 (117.7"x134.6"x117.2")	3200 x 3900 x 3090 (126"x154"x122")	
Cutting capacity (S45C) (mm)	Milling	180 cc/min	270 cc/min	180 cc/min	270 cc/min	180 cc/min	270 cc/min
	Drilling	Ø40	Ø52	Ø40	Ø52	Ø40	Ø52
	Tapping	M30 x P3.5	M42 x P4.5	M30 x P3.5	M42 x P4.5	M30 x P3.5	M42 x P4.5

- All data subject to change without notice.
- All the specifications are listed with the FANUC CNC system.

Standard Accessories:

1. Coolant system
2. Spindle air blast
3. Auto lubrication with alarm
4. Tools, tool box and various manuals
5. LED working lamp
6. Screw type chip conveyor
7. Chip flushing coolant
8. Full enclosure splash guard
9. FANUC 0*i*-MF controller

Optional Accessories:

1. Contact tool setting system (Renishaw TS-27R or BULM NT-A2 / NT-A3)
2. CNC Rotary table
3. Automatic pallet changer (A.P.C.)
4. High pressure coolant thru tool tip
5. High pressure coolant thru spindle (20bar/30bar or more)
6. Arm type ATC 24/32 tools (No.40, No.50, HSK)
7. Chain type chip conveyor
8. Cartridge spindle (12000 rpm for BT/CAT/BBT-40)
9. Direct drive spindle (15000 rpm for BBT-40)
10. Built-in spindle (15000/18000/20000 rpm for HSK A63)
11. Cartridge spindle (8000/10000 rpm for BT/CAT/BBT-50)
12. Internal cooling ballscrew
13. Manual guide *i*(0*i*MF)
14. Electronic compensation of thermal expansion
15. Workpiece measuring system (OMP-60)

CNC Control Specs

■ CNC system type

○: Std. △: Opt. -: Nil

Type / Model	SV-33/41/48/33H/41H/48H
FANUC 0*i*MF	○
FANUC 31*i*MB	△
Heidenhain *i*TNC530 HSCI	△
Siemens 840D	△
Siemens 828D	△

■ Fanuc specifications

○: Std. △: Opt. -: Nil

	Item	Specifications		0iMF	31iMB
Display unit	8.4" color LCD			○	-
	10.4" color LCD			△	○
Function	Data Server with 2GB CF card			△	△
	AICC Ⅱ			△	○
	High speed processing			-	△
	Conversational programming with graphic function	Manual guide 0*i*	0*i*MF	○	-
		Manual guide *i*	31*i*MB / 0*i*MF (10.4" LCD)	△	○
	NC program memory	1280 meter (about 512 KB)		○	○

■ Siemens specifications

○: Std. △: Opt. -: Nil

	Item	Specifications	828D	840D
Operation Panel	10.4" color LCD		○	○
	15.1" color LCD		-	△
	Machine panel MCP483C		○	○
	TCU without hard disk	CF card	○	○
	PCU 50 with hard disk	Include HD & Ethernet	-	△
	Ethernet		○	○
Function	ShopMill programming		△	△
	Automatic residual material detection		△	△
	Universal interpolator NURBS		○	○
	Spline interpolation for 3 - axes		△	△

■ Heidenhain specifications

○: Std. △: Opt. -: Nil

	Item	Specifications	iTNC530 HSCI
Display unit	Visual display unit 15" TFT display		○
Function	Main computer	0.5 ms block processing time	○
	NC programming memory	21GB on SSDR	○
Software option 1	• Cylindrical surface interpolation • Feed rate in mm/min • Tilting the working plane • Circular interpolation in 3 axes with tilted working plane • HSC path control with special nominal-position value filters		△
Software option 2	**3-D machining** • Motion control with minimum jerk • 3-D tool compensation through surface normal vectors • TCPM: Tool center point management • Keeping the tool normal to the contour • Tool radius compensation normal to the tool direction • Manual traverse in the active tool-axis system **Interpolation** • Linear in 5 axes (Subject to export permit) • Spline: execution of splines (3rd degree polynomial)		△

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