

# AV SERIES

High Efficiency Vertical Machining Center

**YAMA SEIKI**  
MACHINING CENTERS by **AWEDA**

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ISO 9001



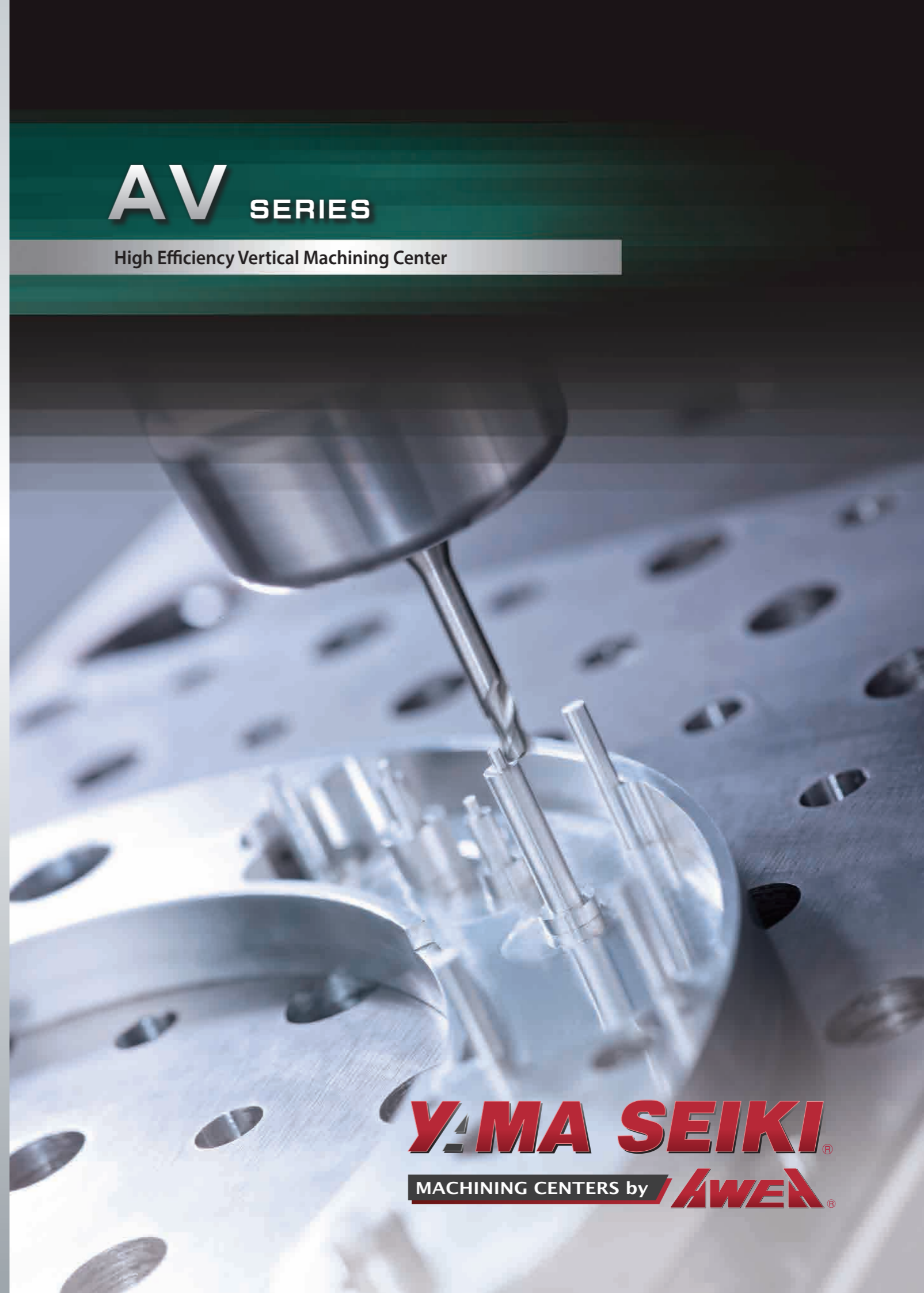
ISO 14001



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**YAMA SEIKI**  
MACHINING CENTERS by **AWEDA**





## High Efficiency Vertical Machining Center

Introducing Yama Seiki's highly efficient vertical machining center with advanced technology and manufacturing abilities, the AV Series. Based on a super rigidity structure and 3 axes high precision linear guideway design that features a fast arm type ATC with chip conveying system, it will provide you with a fast, strong, stable machining performance at a high CP value. It is widely used by high precision machine parts manufacturers and can easily meet your demands of today and tomorrow.



**AV-1250**  
X : 1,250 mm ( 49.2" )  
Y : 620 mm ( 24.4" )  
Z : 620 mm ( 24.4" )



**AV-1000**  
X : 1,020 mm ( 40.1" )  
Y : 550 mm ( 21.6" )  
Z : 635 mm ( 25" )



**AV-860**  
X : 860 mm ( 33.8" )  
Y : 600 mm ( 23.6" )  
Z : 600 mm ( 23.6" )

**AV** Series 610 / 650 / 760 / 860 / 1000 / 1060 / 1250 / 1460

## High Efficiency Vertical Machining Center

Thanks to our advanced developing skills, the AV series was designed especially for the high precision machine parts manufacturers. The AV Series displays high accuracy and efficient machining capabilities and boasts the highest CP value amongst its class.

- High torque belt type spindle design. The spindle and motor are evaluated in-house using the dynamic balance test to ensure optimal machining ability.
- X, Y, Z axes are all adopted with high precision linear guide way design to provide easy control and efficient movement.
- Highly efficient 24T arm type design is reliable and shortens tool change time.
- The hang type control panel and spacious operating area provide an ergonomic working environment.

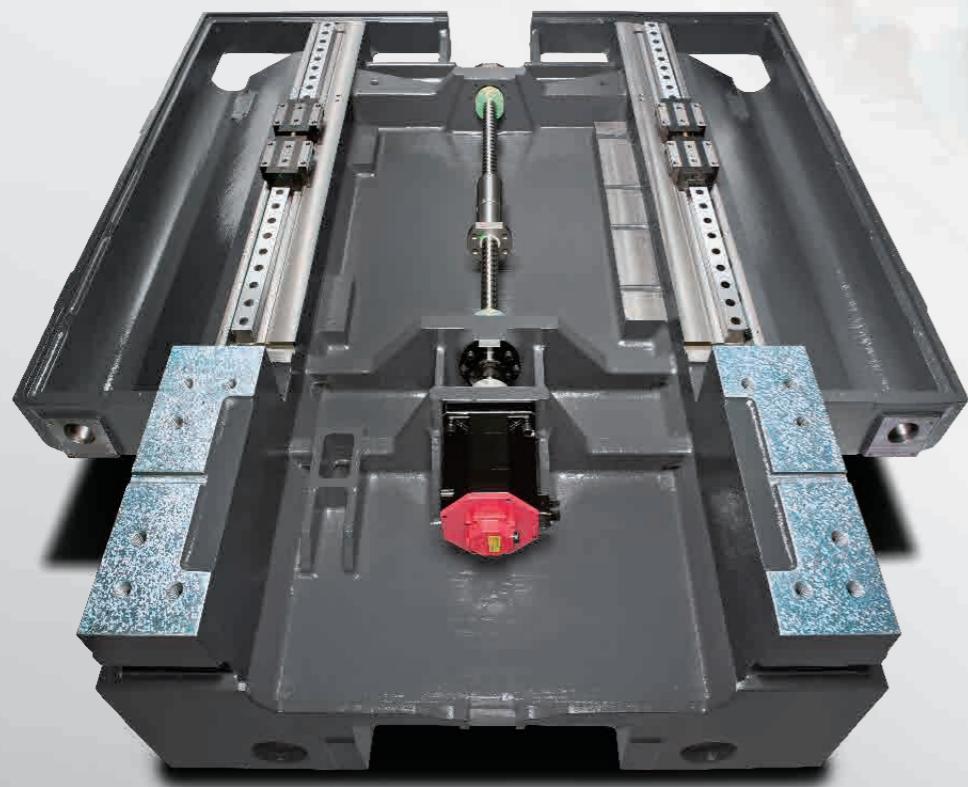
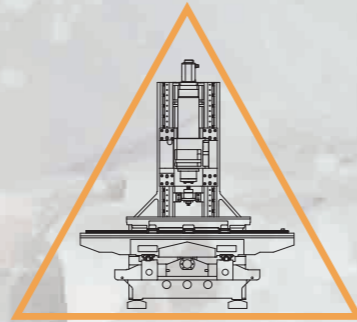


# AV Series 610 / 650 / 760 / 860 / 1000 / 1060 / 1250 / 1460

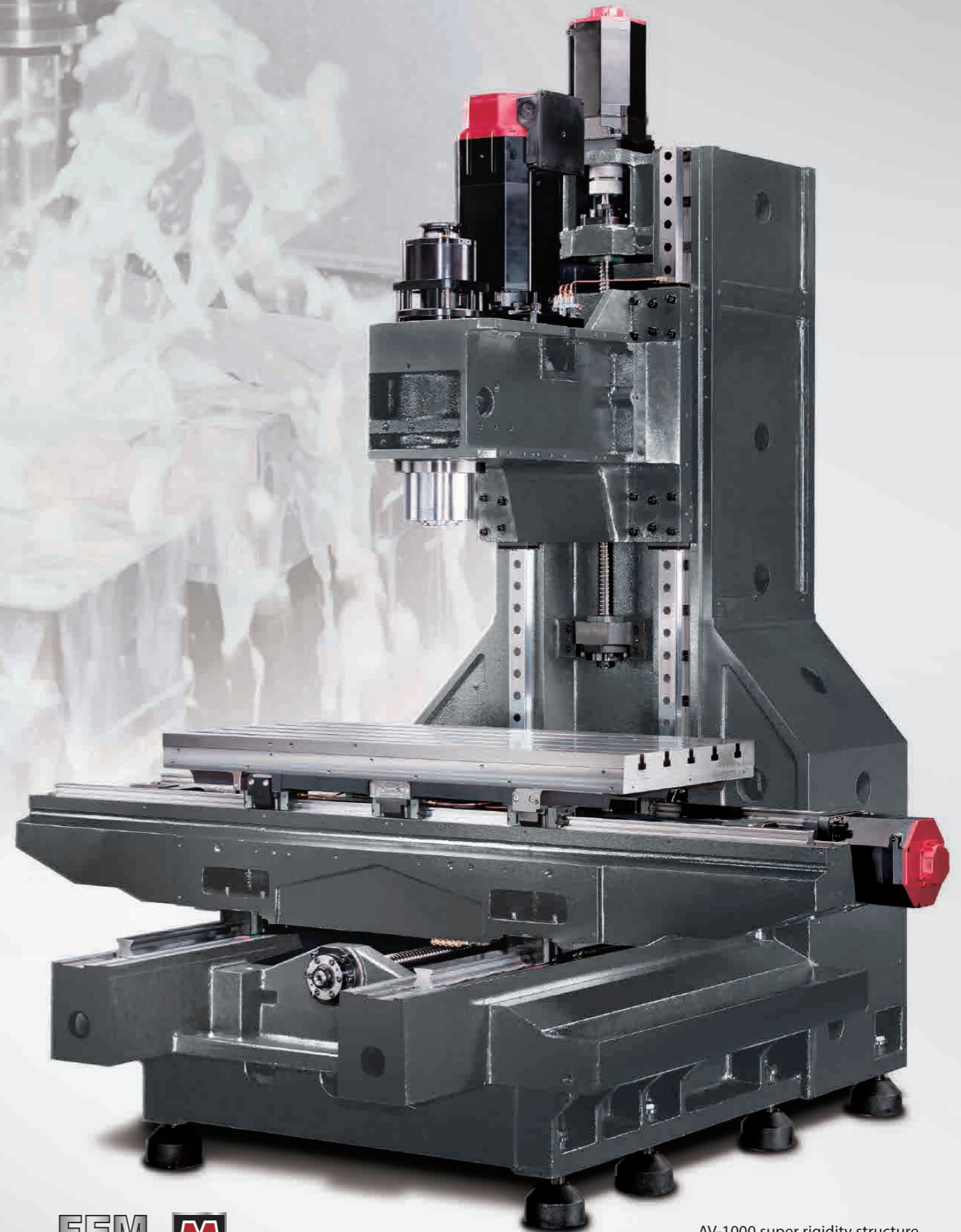
## High Efficiency Vertical Machining Center

### Super Rigidity Structure

- All casting components utilize the Finite Element Analysis ( FEA ) . It provides optimal machine design and light-weighted structural advantages to ensure the best machine rigidity.
- $\Delta$  ( Delta ) wide span column mechanism increases machining rigidity and stabilizes the base during fast movement.
- Rib reinforced working table increases machining stability and will restrain vibrations.



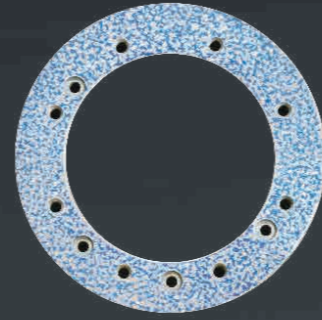
- The column and bed are all precisely hand scraped to ensure optimal assembly precision, structural strength and balanced load.
- The T-shaped MEEHANITE casting base provides strong support and optimal dynamic precision.



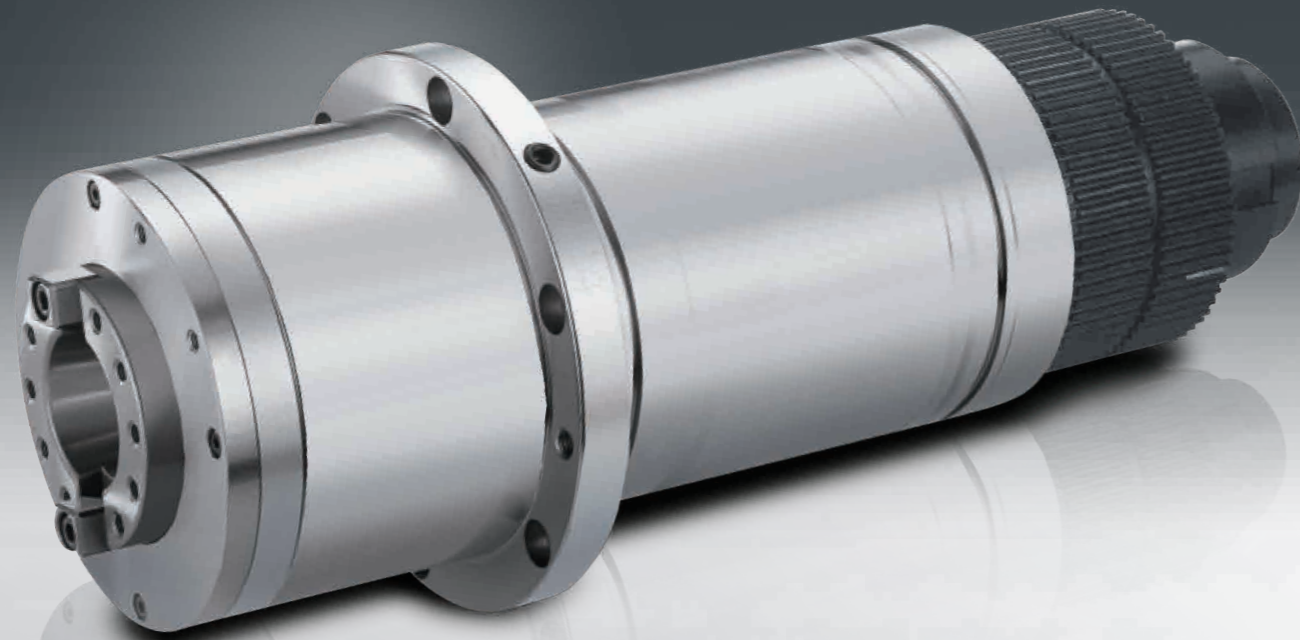
AV-1000 super rigidity structure

# High Performance Spindle System

- The high torque belt type spindle provides 8,000 / 10,000 spindle speed.
- The spindle is equipped with FANUC  $\alpha 8i$  motor which provides maximum output of 11 kW ( 15 HP ).
- All series are standard with spindle oil cooler system to prevent thermal expansion effects and decrease thermal deformation.
- The contact surface between spindle heads and spindle are all precisely hand scraped to ensure optimal performance and precision.



■ The contact surface of spindle heads are all precision hand scraped

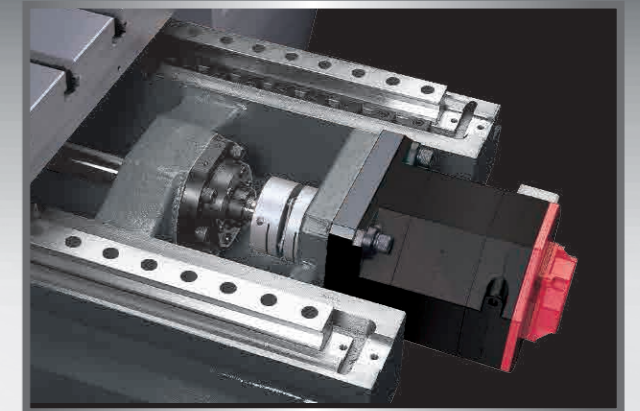


# High Precision Axial Feeding System

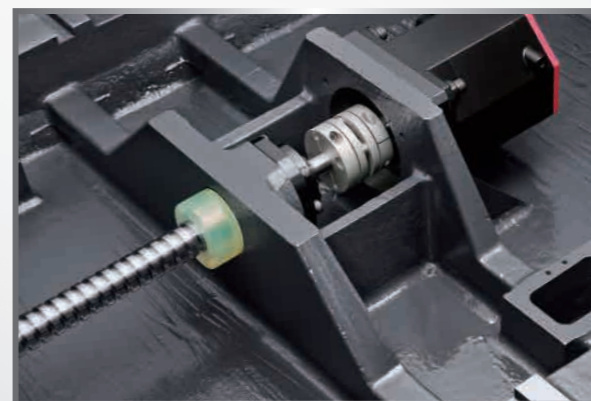
- 3 axes are driven by FANUC  $\alpha i$  series absolute AC direct drive servo motor, which provides powerful thrust, fast acceleration, and deceleration movement. It can greatly decrease motor load and lower thermal expansion to a minimum, ensuring optimal performance and precision.
- The high precision twin rotating nut ball screws provide outstanding heavy-duty cutting and ensure precision as well as a long life span.
- The one-piece ball screw motor mount and bearing box allows the cutting pressure to evenly distribute across the casting body, which increases the axial system overall rigidity and prevents the ball screw from deformation.
- 3 axes maximum feed rate can reach up to 48 m/min ( 1,889 IPM ).



Twin rotating nut ball screw



Direct drive servo motor

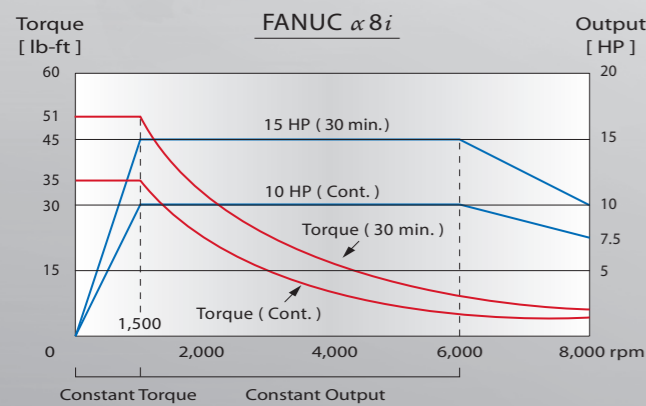


One-piece motor mount

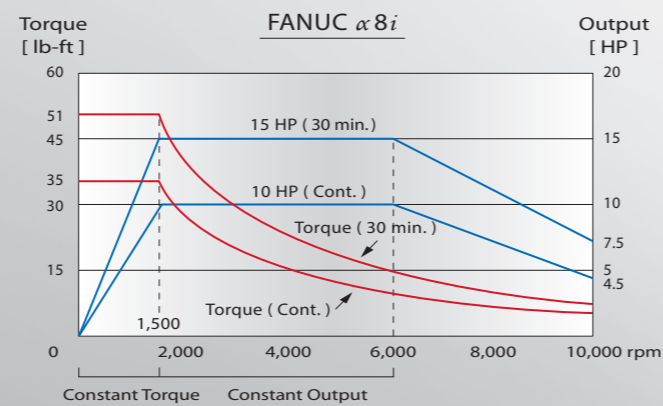


One-piece bearing box

## 8,000 rpm Belt-Driven Spindle



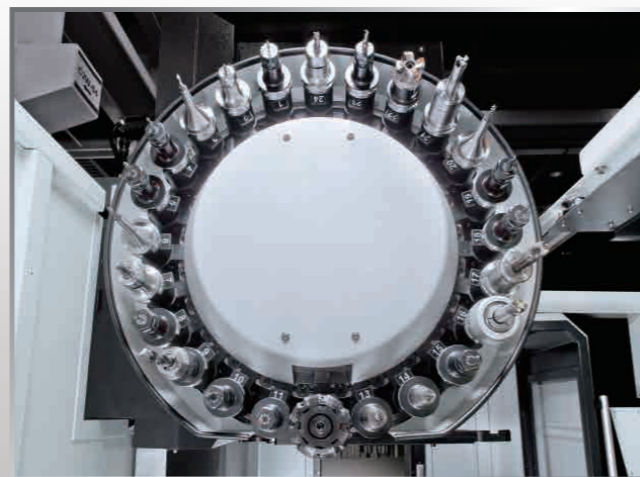
## 10,000 rpm Belt-Driven Spindle





## High Speed ATC System

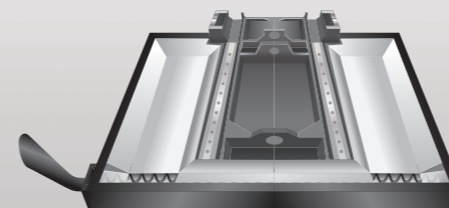
- All series are standard with 24T arm type ATC system which can easily fulfill various types of processing needs.
- Standard short cut tool change function can shorten tool change time and increase working efficiency.
- The chain type tool magazine is supported by the column base which increases stability and decreases tool change vibration, while ensuring precision.



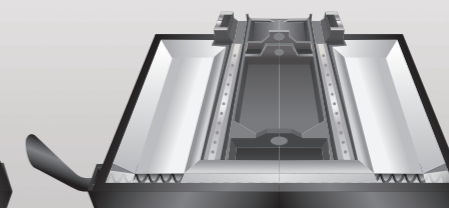
24T Disc type tool magazine

## High Efficiency Chip Disposal System

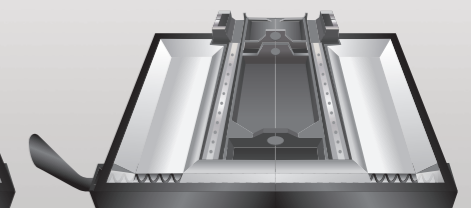
- All series are standard with screw type chip auger. Each model can be equipped with single screw or triple screw type chip conveyors based on different needs.
- The optional high pressure chip flush coolant system is also available.



Single Screw Chip Conveyor



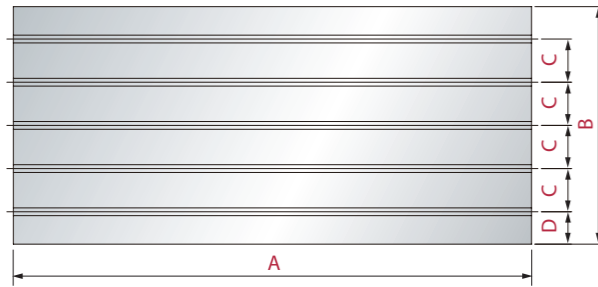
Triple Screw Chip Conveyor



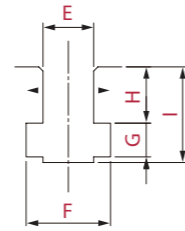
Chain Type Chip Conveyor ( Opt. )

# Dimensions

## Table Dimensions



Models	A		B		C		D	
AV-610	700	27.5	450	17.7	100	3.93	75	2.95
AV-650	750	29.5	510	20.1	100	3.93	105	4.13
AV-760	860	33.8	510	20.1	100	3.93	105	4.13
AV-860	1,000	39.3	600	23.6	100	3.93	100	3.93
AV-1000	1,200	47.2	550	21.6	100	3.93	75	2.95
AV-1060	1,200	47.2	600	23.6	100	3.93	100	3.93
AV-1250	1,350	53.1	620	24.4	100	3.93	110	4.33
AV-1460	1,500	59.1	620	24.4	100	3.93	110	4.33

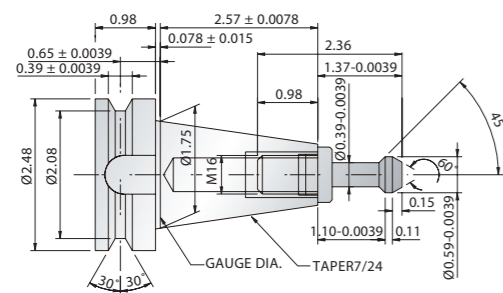


Models	E		F		G		H		I	
AV-610	14	0.55	24	0.94	10	0.39	15.5	0.61	26.5	1.04
AV-650	14	0.55	24	0.94	10	0.39	15	0.59	25.5	1.01
AV-760	14	0.55	24	0.94	10	0.39	15	0.59	25.5	1.01
AV-860	18	0.71	30	1.18	12	0.47	20	0.78	34	1.33
AV-1000	18	0.71	30	1.18	12	0.47	20	0.78	34	1.33
AV-1060	18	0.71	30	1.18	12	0.47	20	0.78	34	1.33
AV-1250	18	0.71	30	1.18	12	0.47	24	0.94	37.5	1.47
AV-1460	18	0.71	30	1.18	12	0.47	24	0.94	37.5	1.47

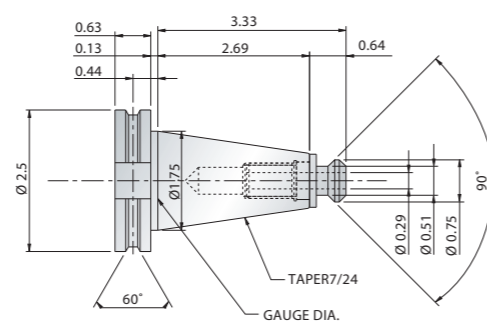
Unit	
mm	inch

## Tool Shank and Pull Stud Dimensions

### BT40

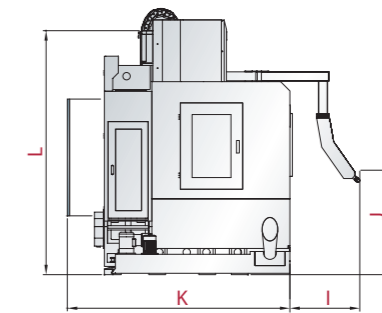
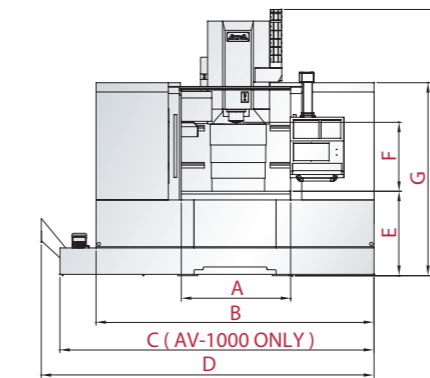
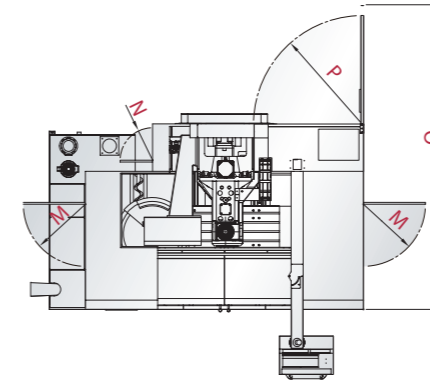


### CAT40



(Unit: inch)

## Machine Dimensions



Unit	
mm	inch

Models	A		B		C		D	
AV-610	900	35.4	2,090	82.2	2,090	82.2	2,420	95.3
AV-650	750	29.5	2,200	86.6	2,415	95.1	2,730	107.4
AV-760	875	29.5	2,200	86.6	2,415	95.1	2,730	107.4
AV-860	1,100	43.3	2,600	102.3	2,810	110.6	3,135	123.4
AV-1000	1,200	47.2	3,000	118.1	3,390	133.4	3,590	141.3
AV-1060	1,300	51.1	3,100	122.1	3,310	130.3	3,635	143.1
AV-1250	1,250	49.2	3,400	133.8	3,400	133.8	3,565	140.3
AV-1460	1,500	59.1	3,850	151.5	3,850	151.5	4,020	158.2

Models	E		F		G		H	
AV-610	850	33.4	600	23.6	1,950	76.7	2,595	102.1
AV-650	850	33.4	610	23.9	1,930	75.9	2,540	100.0
AV-760	850	33.4	610	23.9	1,930	75.9	2,540	100.0
AV-860	950	37.4	700	27.5	2,050	80.1	2,870	112.9
AV-1000	915	35.9	735	28.9	2,080	81.8	2,870	112.9
AV-1060	950	37.4	700	27.5	2,050	80.7	2,870	112.9
AV-1250	880	34.6	720	28.3	2,025	79.7	2,920	114.9
AV-1460	880	34.6	720	28.3	2,025	79.7	2,920	114.9

Models	I		J		K		L	
AV-610	185	7.28	1,220	48.1	2,320	91.3	2,300	90.5
AV-650	475	18.7	880	34.6	2,415	95.1	2,502	98.5
AV-760	180	7.08	880	34.6	2,415	95.1	2,502	98.5
AV-860	665	26.1	1,030	40.5	2,200	86.6	2,540	100.0
AV-1000	755	29.7	1,030	40.5	2,140	84.2	2,635	103.7
AV-1060	665	26.1	1,030	40.5	2,200	86.6	2,540	100.0
AV-1250	665	26.1	1,010	39.7	2,200	87.4	2,617	103.1
AV-1460	665	26.1	1,010	39.7	2,200	87.4	2,617	103.1

Models	M		N		O		P	
AV-610	650	25.5	400	15.7	2,830	111.4	525	20.6
AV-650	670	26.3	400	15.7	2,975	117.1	525	20.6
AV-760	650	25.5	400	15.7	2,975	117.1	545	21.5
AV-860	650	25.5	400	15.7	3,125	123.1	925	36.4
AV-1000	670	26.3	350	13.7	3,320	130.7	1,180	46.4
AV-1060	650	25.5	400	15.7	3,300	129.9	925	36.4
AV-1250	670	26.3	400	15.7	3,115	122.6	550	21.6
AV-1460	670	26.3	400	15.7	3,115	122.6	550	21.6

Specifications are subject to change without notice.

		AV-610	AV-650	AV-760	AV-860	AV-1000	AV-1060	AV-1250	AV-1460
<b>Specifications</b>									
X-axis travel	mm ( inch )	610 ( 24.02 )	650 ( 25.5 )	760 ( 29.9 )	860 ( 33.8 )	1,020 ( 40.1 )	1,060 ( 41.7 )	1,250 ( 49.2 )	1,400 ( 55.1 )
Y-axis travel	mm ( inch )	450 ( 17.7 )	510 ( 20.1 )	510 ( 20.1 )	600 ( 23.6 )	550 ( 21.6 )	600 ( 23.6 )	620 ( 24.4 )	620 ( 24.4 )
Z-axis travel	mm ( inch )	450 ( 17.7 )	510 ( 20.1 )	510 ( 20.1 )	600 ( 23.6 )	635 ( 24.9 )	600 ( 23.6 )	620 ( 24.4 )	620 ( 24.4 )
Distance from spindle center to column	mm ( inch )	558 ( 21.9 )	600 ( 23.6 )	600 ( 23.6 )	800 ( 31.4 )	610 ( 23.9 )	800 ( 31.4 )	790 ( 31.1 )	790 ( 31.1 )
Distance from spindle nose to table top	mm ( inch )	150 ~ 600 ( 5.91 ~ 23.6 )	100 ~ 610 ( 3.93 ~ 23.9 )	100 ~ 610 ( 3.94 ~ 24.0 )	100 ~ 700 ( 3.93 ~ 27.5 )	100 ~ 735 ( 3.93 ~ 28.9 )	100 ~ 700 ( 3.93 ~ 27.5 )	100 ~ 720 ( 3.93 ~ 28.3 )	100 ~ 720 ( 3.93 ~ 28.3 )
<b>Working Table</b>									
Table size ( X )	mm ( inch )	700 ( 27.5 )	750 ( 29.5 )	860 ( 33.9 )	1,000 ( 39.3 )	1,200 ( 47.2 )	1,200 ( 47.2 )	1,350 ( 53.1 )	1,500 ( 59.1 )
Table size ( Y )	mm ( inch )	450 ( 17.7 )	510 ( 20.1 )	510 ( 20.1 )	600 ( 23.6 )	550 ( 21.6 )	600 ( 23.6 )	620 ( 24.4 )	620 ( 24.4 )
Table load capacity	kg ( lb )	450 ( 990 )	500 ( 1,100 )	500 ( 1,100 )	700 ( 1,540 )	700 ( 1,540 )	700 ( 1,540 )	1,000 ( 2,200 )	1,000 ( 2,200 )
<b>Spindle</b>									
Spindle motor ( cont. / 30 min. )	kW ( HP )	7.5 / 11 ( 10 / 15 )							
Spindle speed	rpm	Belt-driven 8,000 / 10,000 ( Opt. )							
Spindle taper		BT40 / CAT40 / DIN40 ( Opt. )							
<b>Feed rate</b>									
X / Y axes rapid feed rate	m/min ( IPM )	32 ( 1,260 )	48 ( 1,890 )	48 ( 1,890 )	48 ( 1,890 )	36 ( 1,418 )	48 ( 1,890 )	48 ( 1,890 )	48 ( 1,890 )
Z-axis rapids feed rate	m/min ( IPM )	24 ( 945 )	32 ( 1,260 )	32 ( 1,260 )	32 ( 1,260 )	24 ( 945 )	32 ( 1,260 )	36 ( 1,418 )	36 ( 1,418 )
Cutting feed rate	m/min ( IPM )	10 ( 394 )							
<b>Tool Magazine</b>									
Tool magazine capacity	T	24							
Max. tool length ( from gauge line )	mm ( inch )	300 ( 11.8 )							
Max. tool weight	kg ( lb )	7 ( 15.4 )							
Max. tool diameter / adj. pocket empty	mm ( inch )	Ø 80 ( 3.14 ) / Ø 150 ( 5.91 )							
<b>Accuracy</b>									
Positioning accuracy ( JIS B 6338 ) / Full Travel	mm ( inch )	± 0.003 / 300 ( ± 0.000118 / 11.8 )							
Positioning accuracy ( VDI 3441 ) / Full Travel	mm ( inch )	P ≤ 0.01 ( P ≤ 0.00039 )							
Repeatability ( JIS B 6338 ) / Full Travel	mm ( inch )	± 0.002 ( ± 0.000078 )							
Repeatability ( VDI 3441 ) / Full Travel	mm ( inch )	Ps ≤ 0.008 ( Ps ≤ 0.00031 )							
<b>General</b>									
Control system		FANUC Oi-MD/ MITSUBISHI M70							
Pneumatic pressure requirement	kg / cm <sup>2</sup> ( PSI )	6 ( 85.2 )							
Power requirement	kVA	20	25	25	30	30	30	35	35
Coolant tank capacity	liter ( gal )	150 ( 40 )	320 ( 85 )	320 ( 85 )	355 ( 94 )	350 ( 93 )	400 ( 105 )	460 ( 121 )	480 ( 126 )
Machine weight	kg ( lb )	3,500 ( 7,700 )	4,200 ( 9,240 )	5,000 ( 11,030 )	5,800 ( 12,760 )	7,000 ( 15,400 )	7,000 ( 15,400 )	8,000 ( 17,600 )	8,200 ( 18,040 )

Specifications are subject to change without notice.

### Standard Accessories

- Spindle air curtain
- Spindle circular coolant
- Spindle cooling system
- Centralized automatic lubricating
- Fully enclosed splash guard
- Coolant equipment
- Screw type chip auger
- Heat exchanger for electrical cabinet
- Tool box
- Air gun
- Alarm light
- Automatic power off system
- Foundation bolt kit

### Optional Accessories

- 10,000 rpm Belt-driven Spindle
- Coolant through spindle
- Spindle thermal compensation
- Oil skimmer
- CNC rotary table
- A / C cooler for electrical cabine
- Coolant through the tool adapter
- Chip wash down coolant system
- Caterpillar type chip conveyor and bucket
- Automatic tool length measurement
- Automatic work piece measurement
- Spindle power failure anti-falling system