

AF SERIES

High Performance Vertical Machining Center

YAMA SEIKI
MACHINING CENTERS by **AWEDA**

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ISO 9001



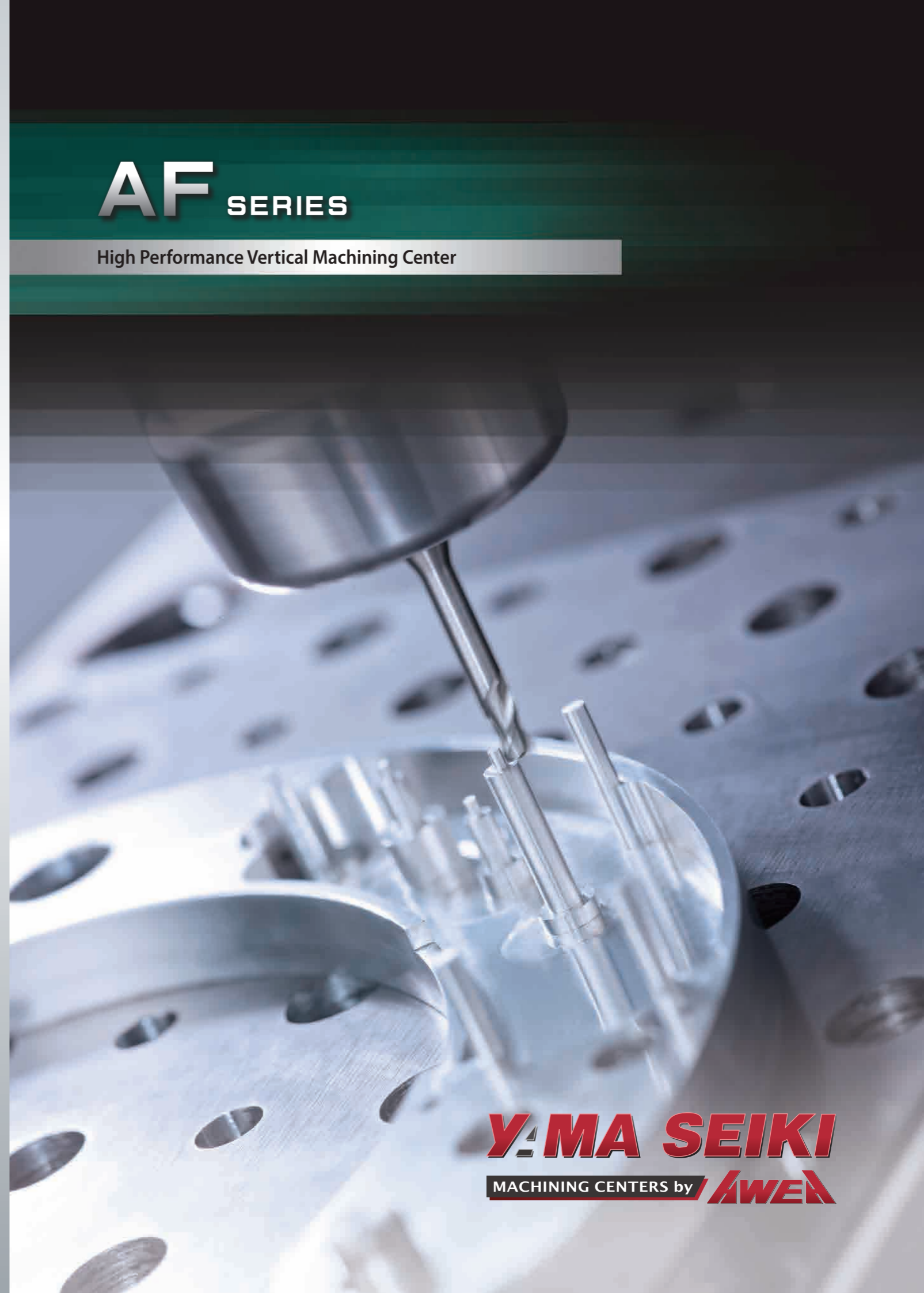
ISO 14001



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YAMA SEIKI
MACHINING CENTERS by **AWEDA**





High Performance Vertical Machining Center

Presenting YAMA SEIKI "The Royal Family of Bridge Machines" of mature manufacturing abilities and advanced technology skills, the AF series are based on a high efficiency direct-driven spindle and super rigidity roller type linear guide way design with super rigidity structure and fast arm type ATC and chip conveying system, to provide you with fast, strong and stable machining performance; with its high CP value, it is broadly used in high precision machine parts manufacturers, which can easily meet your demands of today and tomorrow.



AF-1250
X : 1,250 (49.2")
Y : 620 (24.4")
Z : 620 (24.4")



AF-650
X : 650 (25.5")
Y : 510 (20.1")
Z : 510 (20.1")

(Unit : mm)



AF-1000
X : 1,020 (40.1")
Y : 550 (21.6")
Z : 635 (25.0")

AF Series 610 / 650 / 860 / 1000
1060 / 1250 / 1460 / 1400 / 1600 / 1800

High Performance Vertical Machining Center

Thanks to our advanced developing skills, the AF series are designed especially for high precision machine parts manufacturers. The AF series shows high precision and high efficiency machining capability and has the highest CP value among peer models.

- High speed and high efficiency direct-driven spindle design ensures contour precision machining ability and meets all your cutting requirements.
- X, Y, Z axes are all adopted with heavy-weighted roller type linear guide way design, to provide the best control and support.
- High efficiency 24T arm type design is reliable and shortens tool changing time.
- The hang type control panel and spacious operating area provide an ergonomic working environment.



AF Series

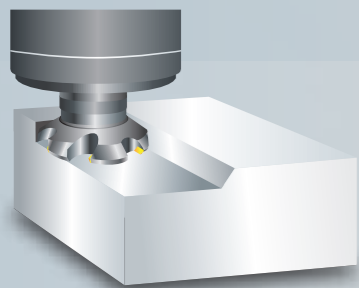
610 / 650 / 860 / 1000
1060 / 1250 / 1460 / 1400 / 1600 / 1800

High Performance Vertical Machining Center

Powerful machining capability and certified quality do not only fulfill various machining demands, but also is longer lasting and provides stable precision.

Test Model **AF-1000**

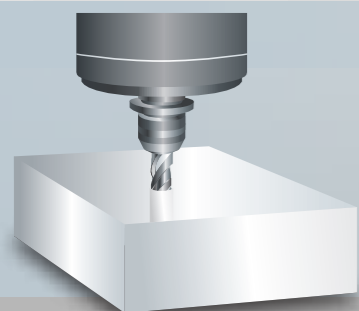
Spindle Motor : FANUC α T8 / 15000 i
Spindle Power : 7.5 / 11 kW (Cont. / 30 min.)
Work Piece Material : S50C



Milling

176 cc/mm Removal Rate

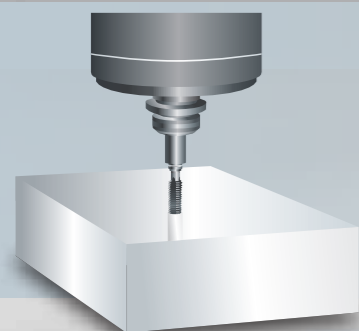
Spindle Speed	Feed Rate	Depth of Cut	Spindle Load
1,200 rpm	2,200 mm/min	1 mm	122%



Drilling

70 cc/mm Removal Rate

Spindle Speed	Feed Rate	Rotary Feed Rate	Spindle Load
1,100 rpm	143 mm/min	0.13 mm/rev	60%



Tapping

M20 Tool

Spindle Speed	Feed Rate	Spindle Load
200 rpm	250 mm/min	75%



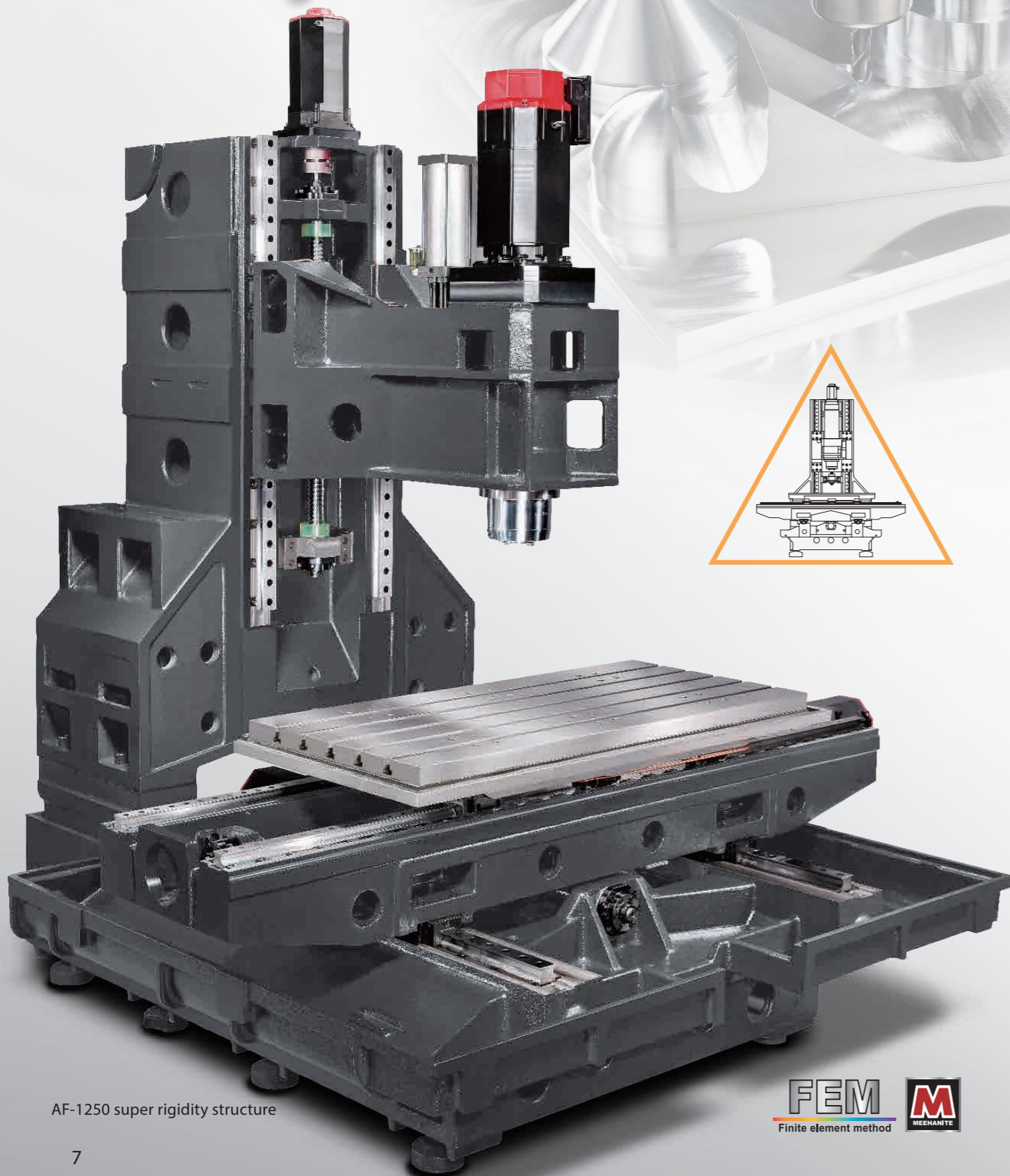
AF

Series

610 / 650 / 860 / 1000

1060 / 1250 / 1460 / 1400 / 1600 / 1800

High Performance Vertical Machining Center

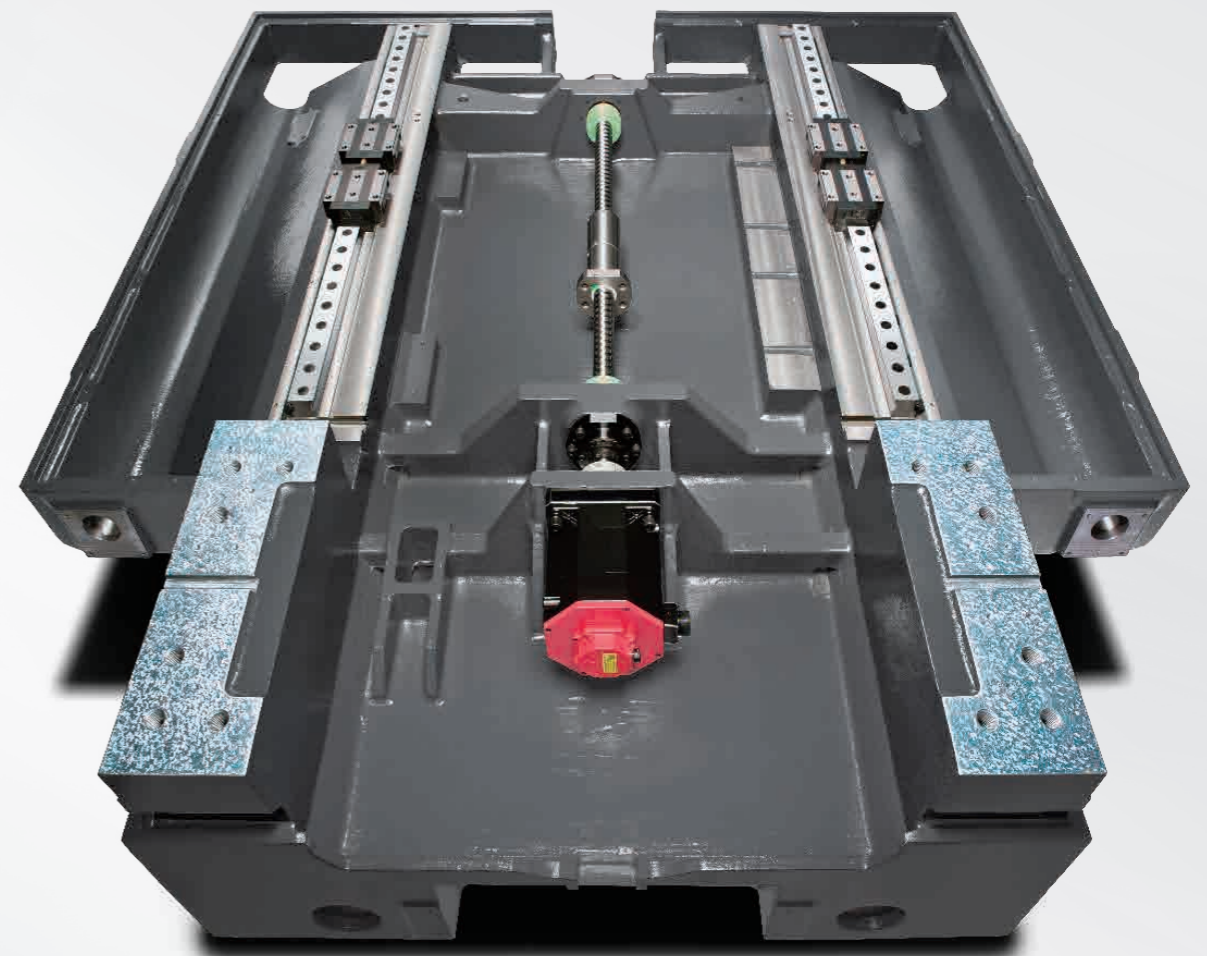


AF-1250 super rigidity structure



Super Rigidity Structure

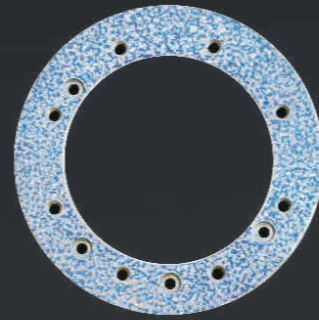
- All casting components are utilized with the Finite Element Analysis (FEA) which provides optimal machine design and light-weighted structure advantages while ensuring the best machine rigidity.
- Δ (Delta) wide span column mechanism ensures a stable base during fast movement while increasing machining rigidity.
- Rib reinforced working table restrains vibration while increasing machining stability.
- X, Y, Z axes are all adopted with super rigidity roller type linear guide ways to provide features of the heavy-duty cutting ability from box ways and high speed low wear advantages from linear guide ways.



- The base uses the best wide span design which provides strong support and optimal dynamic precision.
- The column and bed are all precision hand scraped to ensure optimal assembly precision, structural strength and balanced load.

High Performance Spindle System

- The direct-driven system efficiently blocks the heat that are generated from the motor which reduces thermal deformation while increasing working accuracy during long hours.
- 10,000 rpm, 12,000 rpm and 15,000 rpm are available, which can meet different working conditions and equipped with various FANUC spindle motor.
- Floating type hydraulic tool release device eliminates pressure on the spindle bearing while releasing a tool.
- The contact surface between spindle head and spindle are all precision hand scraped, to ensure optimal performance and precision.



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

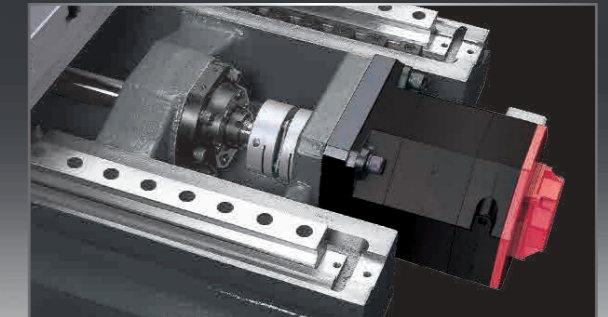


High Precision Axial Feeding System

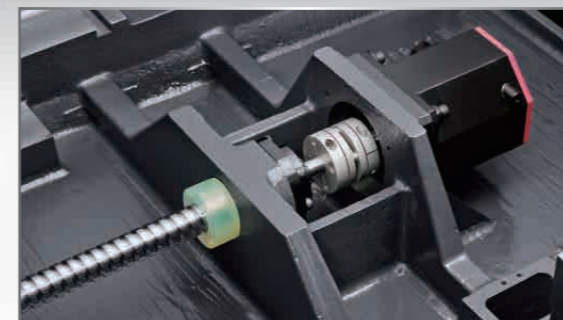
- 3 axes are driven by FANUC αi series absolute AC direct-driven servo motor, which provides a powerful thrust and fast acceleration and deceleration movement. It can greatly decrease motor load, lower thermal expansion effects to minimum, while ensuring optimal performance and precision.
- The high precision twin rotating nut ball screws provide outstanding heavy-duty cutting and ensures precision and 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 (1,890 IPM).



Twin rotating nut ball screw



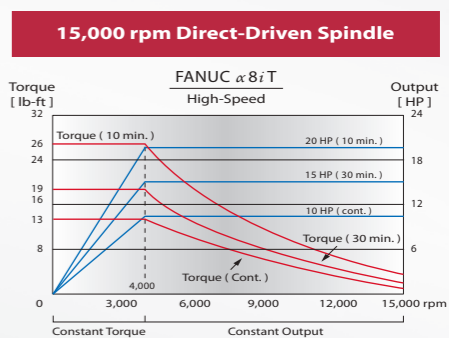
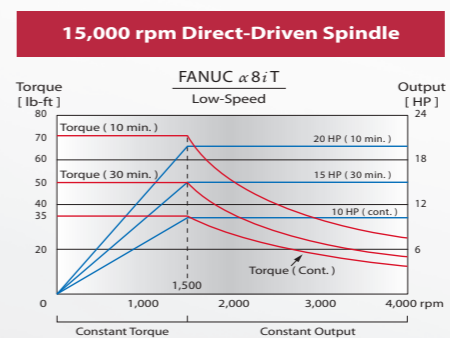
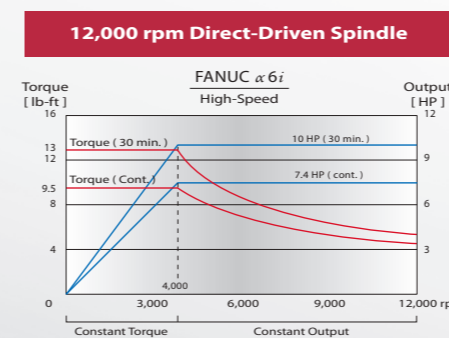
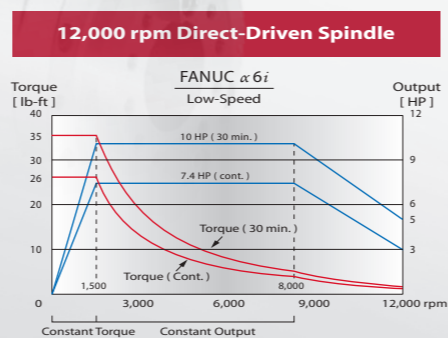
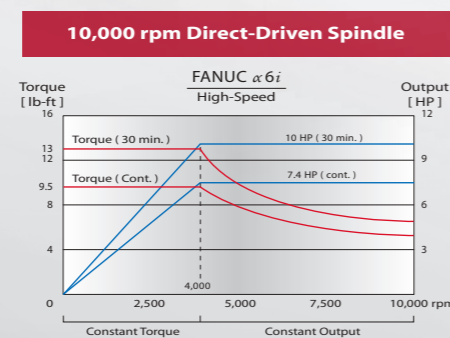
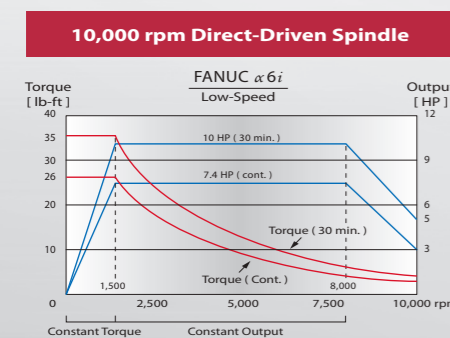
Direct-driven servo motor



One-piece motor mount



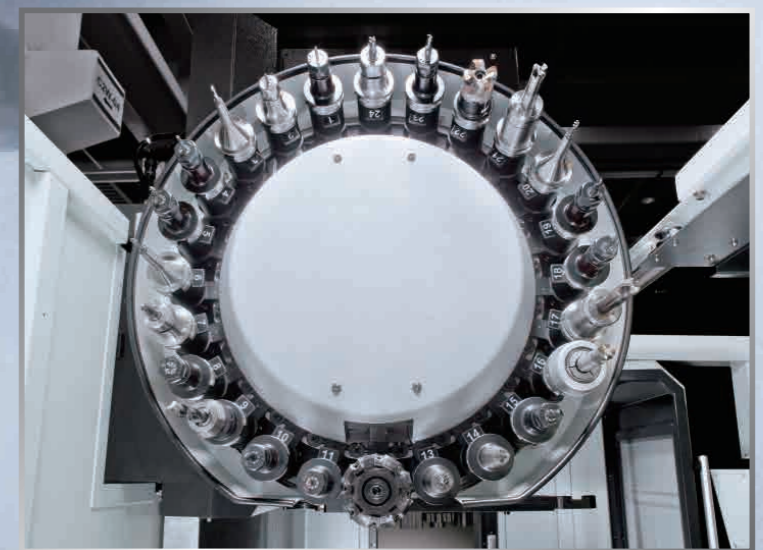
One-piece bearing box





High Speed ATC System

- All series come 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.
- T-T : 1.9 seconds

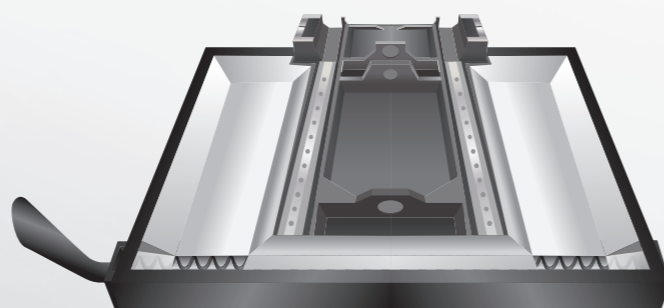


24T Disc type tool magazine

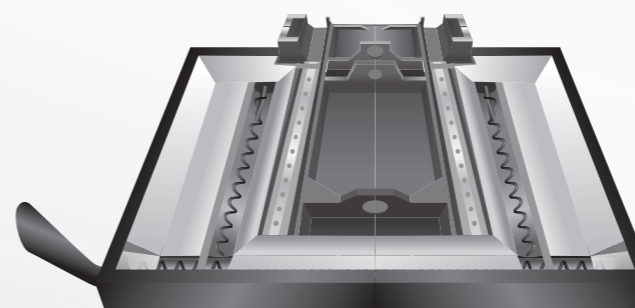


High Efficiency Chip Disposal System

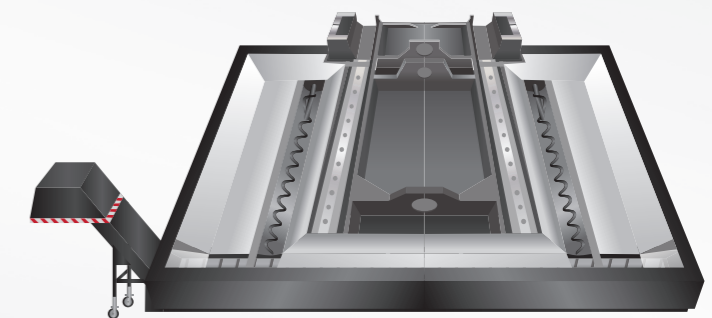
- All series come standard with screw type chip conveyor. Each model can be equipped with single screw or triple screw type chip conveyors based on different needs.
- The optional high pressure chips flush coolant system is also available.



■ Single Screw Chip Conveyor



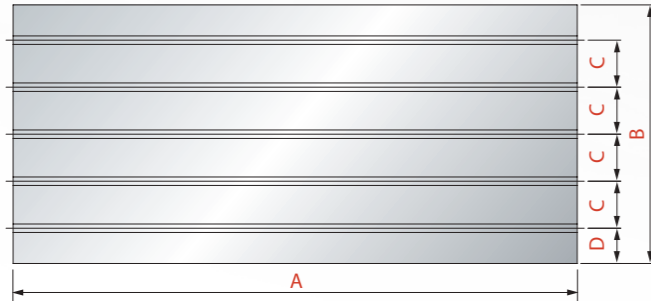
■ Triple Screw Chip Conveyor



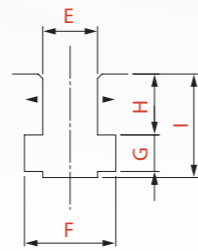
■ Chain Type Chip Conveyor (Opt.)

Dimensions

Table Dimensions



T-slot Dimensions



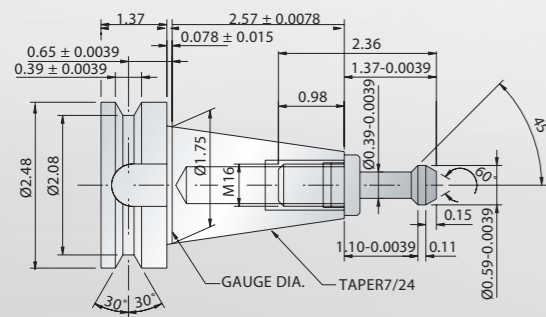
Models	A		B		C		D	
AF-610	700	27.5	450	17.7	100	3.93	75	2.95
AF-650	750	29.5	510	20.1	100	3.93	105	4.13
AF-860	1,000	39.3	600	23.6	100	3.93	100	3.93
AF-1000	1,200	47.2	550	21.6	100	3.93	75	2.95
AF-1060	1,200	47.2	600	23.6	100	3.93	100	3.93
AF-1250	1,350	53.1	620	24.4	100	3.93	110	4.33
AF-1460	1,500	59.1	620	24.4	100	3.93	100	3.93
AF-1400	1,500	59.1	800	31.4	150	5.91	100	3.93
AF-1600	1,700	66.9	800	31.4	150	5.91	100	3.93
AF-1800	1,900	74.8	800	31.4	150	5.91	100	3.93

Unit	
mm	inch

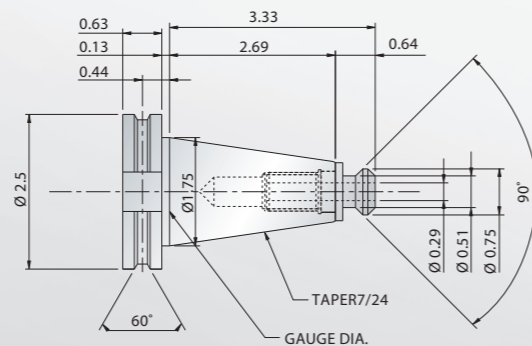
Models	E		F		G		H		I	
AF-610	14	0.55	24	0.94	10	0.39	15.5	0.61	26.5	1.04
AF-650	14	0.55	24	0.94	10	0.39	15	0.59	25.5	1.01
AF-860	18	0.71	30	1.18	12	0.49	20	0.78	34	1.33
AF-1000	18	0.71	30	1.18	12	0.49	20	0.78	34	1.33
AF-1060	18	0.71	30	1.18	12	0.49	20	0.78	34	1.33
AF-1250	18	0.71	30	1.18	12	0.49	24	0.94	37.5	1.47
AF-1460	18	0.71	30	1.18	12	0.49	24	0.94	37.5	1.47
AF-1400	18	0.71	30	1.18	13	0.51	20	0.78	34	1.33
AF-1600	18	0.71	30	1.18	13	0.51	20	0.78	34	1.33
AF-1800	18	0.71	30	1.18	13	0.51	20	0.78	34	1.33

Tool Shank and Pull Stud Dimensions

BT40

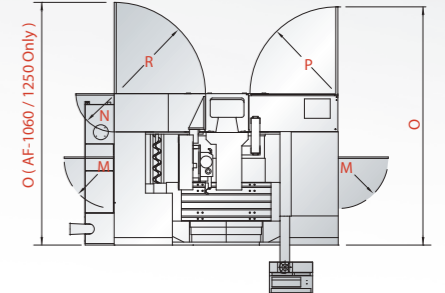
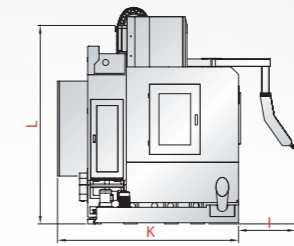
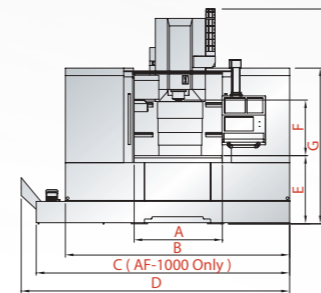


CAT40



(Unit : inch)

Machine Dimensions



Models	A		B		C	
AF-610	900	35.4	2,090	82.2	2,090	82.2
AF-650	750	29.5	2,200	86.6	2,415	95.1
AF-860	1,100	43.3	2,600	102.3	2,810	110.6
AF-1000	1,200	47.2	3,000	118.1	3,390	133.4
AF-1060	1,300	51.1	3,100	122.1	3,310	130.3
AF-1250	1,250	49.2	3,400	133.8	3,400	133.8
AF-1460	1,500	59.1	3,850	151.5	3,850	151.5
AF-1400	1,550	60.9	3,950	155.5	3,950	155.5
AF-1600	1,750	68.8	4,400	173.2	4,400	173.2
AF-1800	1,900	74.8	4,880	192.1	4,880	192.1

Unit	
mm	inch

Models	D		E		F		G		H	
AF-610	2,420	95.2	800	31.4	600	23.6	1,900	74.8	2,595	102.1
AF-650	2,730	107.4	850	33.4	610	23.9	1,930	75.9	2,540	100.0
AF-860	3,135	123.4	950	37.4	700	27.5	2,050	80.7	2,870	112.9
AF-1000	3,590	141.3	915	35.9	735	28.9	2,080	81.8	2,870	112.9
AF-1060	3,635	143.1	950	37.4	700	27.5	2,050	80.7	2,870	112.9
AF-1250	3,565	140.3	880	34.6	720	28.3	2,025	79.7	2,920	114.9
AF-1460	4,020	158.2	880	34.6	720	28.3	2,025	79.7	2,920	114.9
AF-1400	4,070	160.2	1,050	41.3	1,000	39.3	2,315	91.1	3,405	133.9
AF-1600	4,520	177.9	1,050	41.3	1,000	39.3	2,315	91.1	3,405	133.9
AF-1800	5,000	196.8	1,050	41.3	1,000	39.3	2,315	91.1	3,405	133.9

Models	I		J		K		L		M	
AF-610	400	15.7	1,210	48.1	2,320	91.3	2,270	89.3	650	25.5
AF-650	475	18.7	880	34.6	2,415	95.1	2,502	98.5	670	26.3
AF-860	665	26.1	1,100	43.3	2,200	86.6	2,540	100.0	650	25.5
AF-1000	755	29.7	1,030	40.5	2,140	84.2	2,635	103.7	670	26.3
AF-1060	665	26.1	1,100	43.3	2,200	86.6	2,540	100.0	650	25.5
AF-1250	665	26.1	1,010	39.7	2,220	87.4	2,617	103.1	670	26.3
AF-1460	665	26.1	1,010	39.7	2,220	87.4	2,617	103.1	670	26.3
AF-1400	655	26.1	1,150	45.2	2,950	116.1	2,980	117.3	900	35.4
AF-1600	655	26.1	1,150	45.2	2,950	116.1	2,980	117.3	900	35.4
AF-1800	655	26.1	1,150	45.2	2,950	116.1	2,980	117.3	900	35.4

Models	N		O		P		Q		R	
AF-610	400	15.7	2,830	111.4	545	21.4	1,100	43.3	-	-
AF-650	400	15.7	2,975	116.4	525	20.6	1,100	43.3	-	-
AF-860	400	15.7	3,125	123.1	925	36.4	-	-	840	33.1
AF-1000	350	13.7	3,320	130.7	1,180	46.4	-	-	1,050	41.3
AF-1060	400	15.7	3,300	129.9	925	36.4	-	-	1,100	43.3
AF-1250	400	15.7	3,115	122.6	550	21.6	-	-	895	35.2
AF-1460	400	15.7	3,115	122.6	550	21.6	-	-	895	35.2
AF-1400	-	-	3,675	144.6	600	23.6	-	-	-	-
AF-1600	-	-	3,675	144.6	600	23.6	-	-	-	-
AF-1800	-	-	3,675	144.6	600	23.6	-	-	-	-

Specifications are subject to change without notice.

		AF-610	AF-650	AF-860	AF-1000	AF-1060	AF-1250	AF-1460	AF-1400	AF-1600	AF-1800	
Specifications												
X-axis travel	mm (inch)	610 (23.9)	650 (25.5)	860 (33.8)	1,020 (40.1)	1,060 (41.7)	1,250 (49.2)	1,400 (55.1)	1,400 (55.1)	1,600 (62.9)	1,800 (70.8)	
Y-axis travel	mm (inch)	450 (17.7)	510 (20.1)	600 (23.6)	550 (21.6)	600 (23.6)	620 (24.4)	620 (24.4)	800 (31.4)	800 (31.4)	800 (31.4)	
Z-axis travel	mm (inch)	450 (17.7)	510 (20.1)	600 (23.6)	635 (24.9)	600 (23.6)	620 (24.4)	620 (24.4)	800 (31.4)	800 (31.4)	800 (31.4)	
Distance from spindle nose to table top	mm (inch)	558 (21.9)	600 (23.6)	800 (31.4)	610 (23.9)	800 (31.4)	790 (31.1)	790 (31.1)	963 (37.9)	963 (37.9)	963 (37.9)	
Distance between columns	mm (inch)	150 ~ 600 (5.91 ~ 23.6)	100 ~ 610 (3.93 ~ 23.9)	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)	200 ~ 1,000 (7.87 ~ 39.3)	200 ~ 1,000 (7.87 ~ 39.3)	200 ~ 1,000 (7.87 ~ 39.3)	
Working Table												
Table size (X direction)	mm (inch)	700 (27.5)	750 (29.5)	1,000 (39.3)	1,200 (47.2)	1,200 (47.2)	1,350 (53.1)	1,500 (59.1)	1,500 (59.1)	1,700 (66.9)	1,900 (74.8)	
Table size (Y direction)	mm (inch)	450 (17.7)	510 (20.1)	600 (23.6)	550 (21.6)	600 (23.6)	620 (24.4)	620 (24.4)	800 (31.4)	800 (31.4)	800 (31.4)	
Table load capacity	kg (lb)	450 (990)	500 (1,100)	700 (1,540)	700 (1,540)	700 (1,540)	1,000 (2,200)	1,000 (2,200)	1,200 (47.2)	1,500 (58.9)	1,800 (70.8)	
Spindle												
Spindle motor (cont. / 30 min.)	kW (HP)	5.5 (7.4 HP) / 7.5 (10 HP) [10,000 / 12,000 rpm] ; 7.5 (10 HP) / 11 (15 HP) [15,000 rpm]						11 (15 HP) / 15 (20 HP)				
Spindle speed	rpm	Direct-driven 10,000 / 12,000 / 15,000						Direct-driven 8,000				
Spindle taper		BT40						BT50				
Feed rate												
X / Y axes rapid feed rate	m / min (IPM)	32 (1,260)	32 (1,260)	36 (1,418)	36 (1,418)	36 (1,418)	48 (1,890)	48 (1,890)	30 (1,180)	30 (1,180)	30 (1,180)	
Z-axis rapids feed rate	m / min (IPM)	24 (945)	24 (945)	24 (945)	24 (945)	24 (945)	36 (1,418)	36 (1,418)	24 (945)	24 (945)	24 (945)	
Cutting feed rate	m / min (IPM)	1-10 (1- 394)										
Tool Magazine												
Tool magazine capacity	T	24										
Max. tool length	mm (inch)	250 (9.84)				300 (11.8)			350 (13.7)			
Max. tool weight	kg (lb)	7 (15.4)						15 (33)				
Max. tool diameter / adj. pocket empty	mm (inch)	Ø 80 (3.14) / Ø 150 (5.91)						Ø 127 (5.00) / Ø 200 (7.87)				
Accuracy												
Positioning accuracy (JIS B 6338)	mm (inch)	± 0.01 (± 0.00039)										
Positioning accuracy (VDI 3441)	mm (inch)	P = 0.01 (0.00039)						P = 0.012 (0.00047)				
Repeatability (JIS B 6338)	mm (inch)	± 0.003 (± 0.00011)										
Repeatability (VDI 3441)	mm (inch)	Ps=0.005 (Ps=0.00019)		Ps = 0.008 (Ps = 0.00031)								
General												
Control system		FANUC Oi- MF										
Pneumatic pressure requirement	kg / cm ² (PSI)	6 (85.2)										
Power requirement	kVA	20	25	30	30	30	35	35	40			
Coolant tank capacity	liter (gal)	150 (39.6)	320 (84.4)	355 (93.7)	350 (92.4)	400 (105.6)	460 (121.4)	480 (126.7)	505 (133.3)	518 (136.7)	600 (158.4)	
Machine weight	kg (lb)	3,500 (7,700)	4,200 (9,240)	5,800 (12,760)	7,000 (15,400)	7,000 (15,400)	8,000 (17,600)	8,200 (18,040)	14,000 (30,800)	16,000 (35,200)	18,000 (39,600)	

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 conveyor
- Automatic power off system
- Heat exchanger for electrical cabinet
- Foundation bolt kit
- Tool box
- Air gun
- Alarm light

Optional Accessories

- Direct-driven Spindle
12,000 / 15,000 rpm
- 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
- Automatic tool length measurement
- Automatic work piece measurement
- Spindle power failure anti-falling system
- Arm type tool magazine