

TWIN SPINDLE

Vertical Machining Centers



GEMINI MINI SERIES

GEMINI Jr.

GEMINI Jr. XL

GEMINI XL

GEMINI 400 XL

GEMINI MAX

Twin Spindle Vertical Machining Centers

The new era has seen continuous demand from the customers to improve machine accuracies, productivity in terms of machining cycle time and need for automation interface. To meet the demands of the customers AMS has developed few special machining centers.

With the increase in input costs including infrastructure and man power costs, machine tool users have become more cautious in the resource utilization. These conditions have led to development of the twin spindle machines "Gemini" where the productivity of the machine is nearly double to that of single spindle machines with similar specifications.

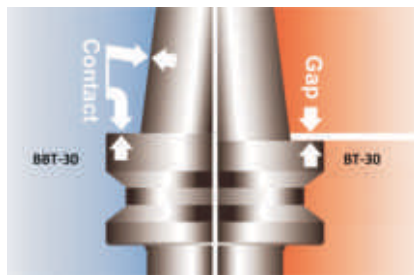
The twin spindle machines are also advantageous as they occupy lesser floor space as compared to two similar machines together and can be operated by a single operator or by a single robot. The machines are built on sturdy structures to house the two spindles which are precisely assembled to obtain high accuracies. The twin spindle machines have gained popularity in the auto-component manufacturing industry due to its suitability for high volume production and structural rigidity.



High Speed Spindle

AMS Gemini Machines equipped with high rigid, high speed spindle with quadruplex back to back arrangement, optimally pre loaded and grease lubricated. The spindles are dynamically balanced to perform better. Spindles with BT30, BT40 & BT50 are available as standard. HSK A63 & A100 tapered spindles are offered as options. The Gemini-mini is available with BBT-30 spindle as well.

BBT-30 Spindles



BBT is a spindle system that provides dual contact between the spindle face and the flange face of tooling. BBT greatly increase tool rigidity, reduce run out and add significant productivity to machining applications. The unique tool holding technology increases surface contact with the tool holder, maximizing rigidity and clamping pressure. There is a significant advantage in tool life, accuracy and cutting capability when compared to standard tool holders.

Quality & Inspection

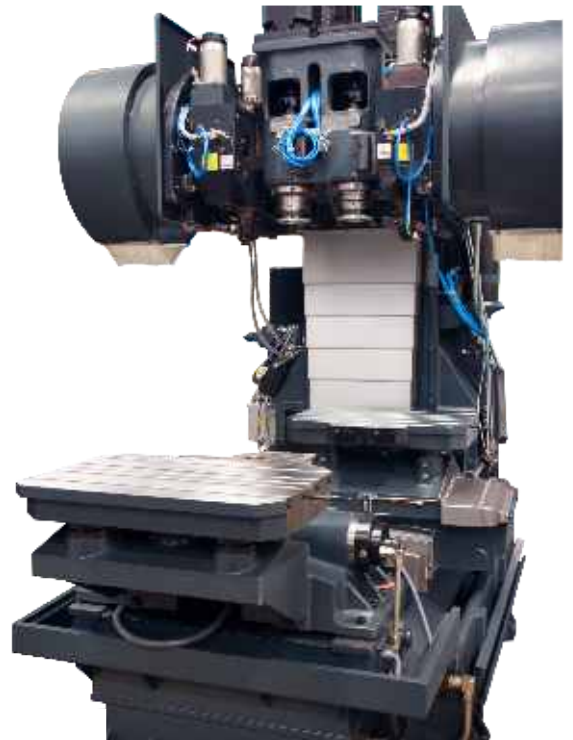


The machine geometric accuracies are fully inspected to assure the highest accuracy standards. The high precision laser unit is applied for inspecting positioning accuracy & repeatability & ball bar tester to inspect the geometric error & ensures superior circular accuracy through parameter adjustment.

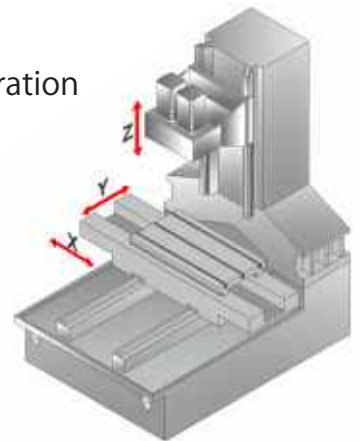


Cutting inspection

Heavy cut & NAS test before shipment, each AMS machine is subject to cutting tests which are combined with proper parameter adjustments to guarantee the best possible cutting quality.



Axes Configuration



Automatic Tool Changer



Gemini Jr, Gemini XL, Gemini 460, Gemini Mini and Gemini Max are with 20 x 2 tool automatic tool changer as standard feature.

Centre distance between spindles

Gemini mini S	: CD 250 mm
Gemini mini L	: CD 360 mm
Gemini jr. / jr. XL	: CD 250 mm
Gemini XL / Max	: CD 400 mm
Gemini 460	: CD 460 mm

Accuracy

	VDI DGQ 3441	ISO 230-2
Positioning	0.015 mm	0.010 mm
Repeatability	± 0.005 mm	± 0.003 mm

Automatic pallet changer

The automatic pallet changer system on the machine reduces unproductive time during machining. Machining can be carried out on one pallet, while the other can be used for preparation (seating and clamping of work-pieces etc.).

Rotary type pallet changer option is available on some of the Gemini models.



Rotary Pallet Changer	Gemini Mini S	Gemini Mini L	Gemini Jr./Jr. XL	Gemini XL	Gemini 460 XL
Pallet size (mm)	600 x 400	800 x 400	700 x 450	800 x 450	920 x 450
Max. load on pallet (Kgf.)	200	200	300	350	300
Pallet changing time (Sec.)	10	10	10	12	12
Machine (width x depth)	2500 x 4100	3000 x 4100	2500 x 3800	3200 x 4200	3200 x 4200

Coolant system



Std. Coolant tank



Grundfos or Wanner Pump

Through coolant increases tool life, allows higher cutting speeds, and clears chips during deep hole drilling. Two systems are available.

1. CTS with Grundfos Pump (21 bar pressure)
2. CTS with Wanner Pump (50 bar pressure).

Coolant Tank:

Large capacity chip tray, reliable & trouble free, convenient & easy to maintain

CNC Control System Options



Fanuc OiMATE MD / OiMD



Siemens 828D

Fanuc OiMF is standard for Gemini Series

Siemens 828 is optional for Gemini mini Series

Chip Conveyor



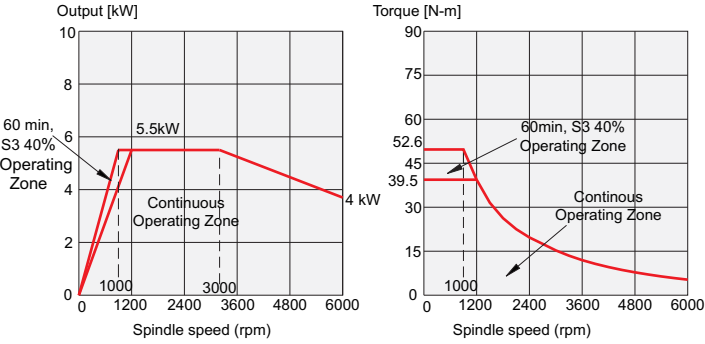
Removing chips is very important in terms of productivity & environmental protection. AMS provides various chip handling systems for better work environment. Coil conveyor & screw conveyor also offered

	Al Chips	Cast Iron Chips	Steel (Short Chips)
Scraper	✓	✓	
Slat cum scraper	✓	✓	✓
Magnetic		✓	✓

Spindle Power Torque Diagram

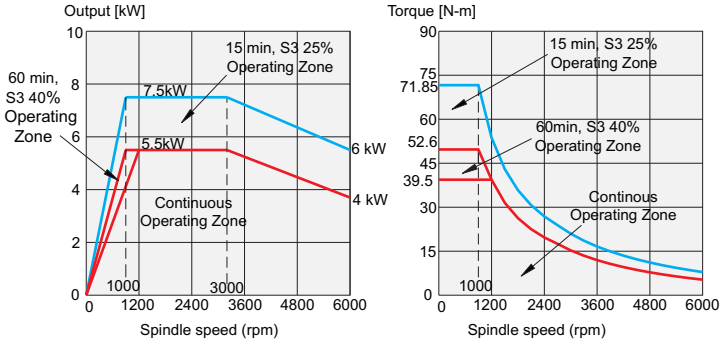
GEMINI MINI S & GEMINI MINI-L

Make : Fanuc, Rated Power : 11 kW (5.5 kW per spindle)
Max. Spindle Speed : 8000 rpm



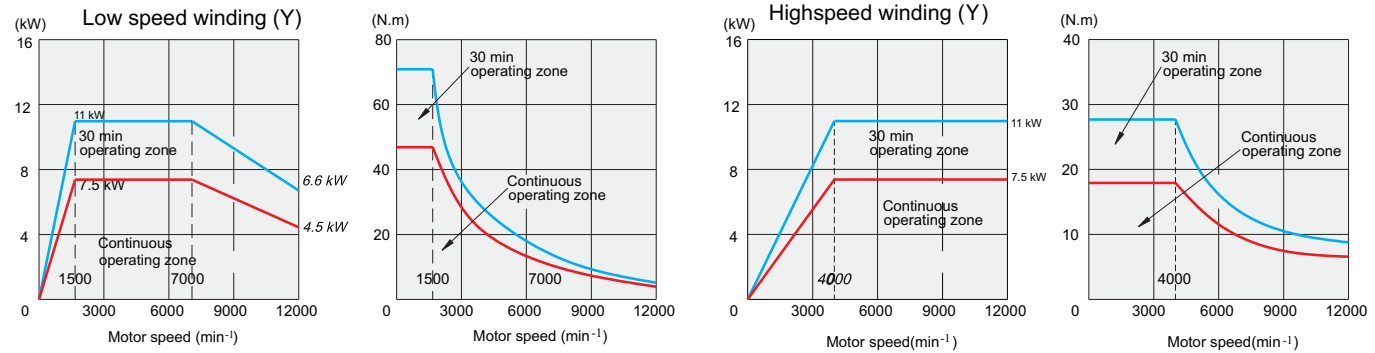
GEMINI Jr.

Make : Fanuc, Rated Power : 7.5/5.5 kW
Max. Spindle Speed : 6000 rpm



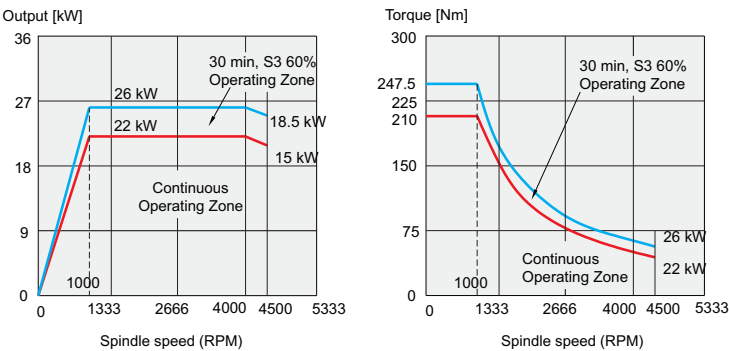
GEMINI-XL

Make : Fanuc, Rated Power : 11/7.5 kW
Max. Spindle Speed : 12000 rpm

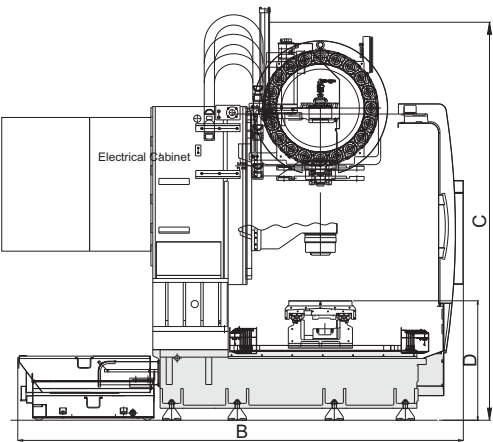
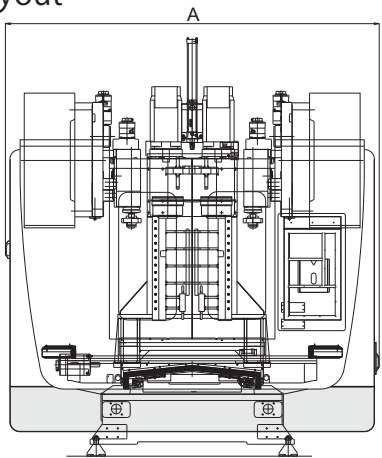


GEMINI-MAX

Make : Fanuc, Rated Power : 26 / 22 kW (Opt.)
Max. Spindle Speed : 4000 rpm



Machine Layout



	A (width)	B (depth)	C (height)	D
Gemini Mini s	2000	2950	3100	960
Gemini Mini l	2200	2950	3100	960
Gemini Jr	2000	3100	3450	925
Gemini Jr XL	2000	3100	3450	925
Gemini XL	2300	3600	3450	985
Gemini 460 XL	2400	3600	3450	985
Gemini Max	3000	4200	3800	985

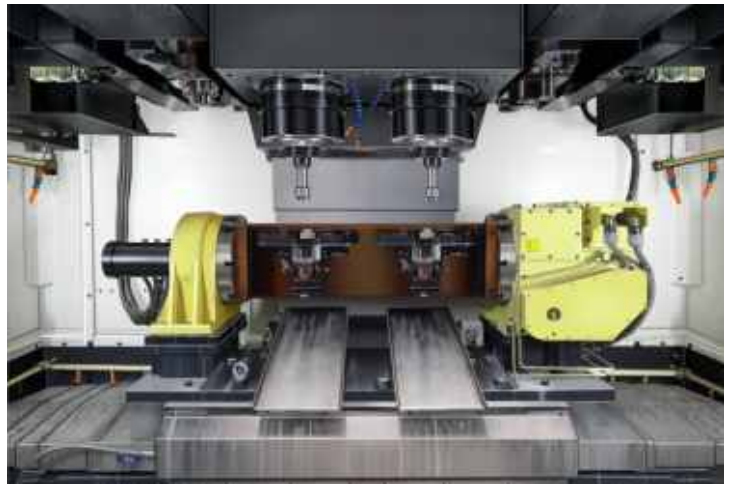
Total Solutions

From the planning stage to Production

- Process identification
- Fixture development & Interface
- Automation integration
- Complete prove-out

Application Solutions

The application engineering team of AMS has wide experience in identifying the process for machining and providing suitable workholding and tooling solutions. This ranges across the markets from high speed & productivity solutions for the automotive industry to the high precision and accuracy solutions for the aerospace or mould making industry. This not only includes support in selection of the most suitable machines but also designing the fixtures and identification of the ideal cutting tool for the selected process. The entire prove out of the components to meet the desired cycle time can be undertaken when solutions are opted for.



Automation Solutions

It is a constant endeavor to provide better productivity on our products. Our machines are made suitable for automation interface of different types. With the experience of providing machining solutions AMS is capable of augmenting the manufacturing process with integration of automation solutions. Either semi-automated with auto-unloading or fully automated with unmanned operations there are myriad of options to choose from suiting the machining process and layout. Our automation solutions provide enhanced productivity, output consistency and minimized dependency on man power.



Advantages of Twin Spindle Machine

Twin Spindle machines are best suited for Automobile Industry catering to High volume Production

- Productivity & Economy.
- Two times the productivity, two parallel spindles machining two identical work pieces at once.
- Reduction in cycle time (Almost 42 % reduction)
- Reduction in cost per component (Almost 35 % reduction)
- Reduction in the man power requirement & maintenance cost.
- Less floor space requirement
- Energy efficient

Standard Features

- | | | |
|--|---|---|
| <ul style="list-style-type: none">• Twin spindle• Rigid tapping• Tool shank: BT-30 (Gemini mini series), BT-40 (Gemini Jr./Jr.XL/XL), BT-50 (Gemini Max) | <ul style="list-style-type: none">• Operation manual• Three tier indication lamp• Work light• Full guarding• Flood coolant, Chip flushing | <ul style="list-style-type: none">• Coolant tank & Chip tray• Laser calibration & ball bar test• 20 (2) tool side mounted ATC• Panel cooler for electrical cabinet |
|--|---|---|

Optional Features

- | | | |
|--|--|--|
| <ul style="list-style-type: none">• Increased day light area• Through spindle coolant system• Tool shank: BBT-30(Gemini mini series), HSK A63 (Gemini Jr.XL/XL), | <ul style="list-style-type: none">• HSK A100 (Gemini Max)• Chip conveyor• Higher spindle speed• Automatic pallet changer (Rotary type)• Distance between two spindles: | <ul style="list-style-type: none">• 550 mm (Gemini Max)• CNC Rotary table• TPM Friendly machine• Tooled up solutions• Power back up system |
|--|--|--|

Specifications

		Gemini Mini - S	Gemini Mini - L	Gemini Jr	Gemini Jr XL	Gemini XL	Gemini 460 XL	Gemini Max
CAPACITY								
Longitudinal travel (X - Axis)	mm	400	600	500	500	600	600	750
Headstock travel (Y - Axis)	mm	400	450	450	450	450	450	500
Cross travel (Z - Axis)	mm	500	500	600	600	600	600	600
Spindle face to table top	mm	190 - 690	160-660	175 - 775	175 - 775	145 - 745	145 - 745	250-850
Distance between two spindles	mm	250	360	250	250	400	460	400
Distance from floor to table top	mm	960	960	925	925	985	985	985
TABLE								
Table size	mm x mm	800 x 400	1100 x 450	900 x 450	900 x 450	1200 x 480	1200 x 480	1400 x 520
T - slot Table	size	M 12@100 P	M 12@90 P	M 12@100 P	M 12@100 P	M 12@100 P	M 12@100 P	M 16@100 P
Max. load on Table	kgf	350	250	500	500	500	500	1000
SPINDLE & AXES								
Spindle taper		7 / 24 No.30	7 / 24 No.30	7 / 24 No.40	7 / 24 No.40	7 / 24 No.40	7 / 24 No.40	7 / 24 No.50
Spindle speed - Std.	rpm	60 - 6000	60 - 6000	80 - 8000	80 - 8000	80 - 8000	80 - 8000	40-4000
- Opt.		80 - 8000	80 - 8000		100-10000	100-10000	100-10000	
Spindle power	kW	11	11	7.5 / 5.5 (2)	7.5 / 5.5 (2)	7.5 / 5.5 (2)	7.5 / 5.5 (2)	15 / 11 (2)
Spindle power - Opt	kW				11 / 7.5 (2)	11 / 7.5 (2)	11 / 7.5 (2)	26 / 22 (2)
Rapid traverse - X / Y / Z	m/min	50 / 50 / 40	50 / 50 / 40	24 / 24 / 24	50 / 50 / 40	50 / 50 / 40	50 / 50 / 40	40 / 40 / 40
Feed rate	mm/min	1 - 10000	1 - 10000	1 - 10000	1 - 10000	1 - 10000	1 - 10000	1 - 10000
Guideway Type		LM	LM	LM	LM	LM	LM	LM
ACCURACY -- As per ISO 230-2								
Positioning accuracy	mm	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Repeatability	mm	± 0.003	± 0.003	± 0.003	± 0.003	± 0.003	± 0.003	± 0.003
AUTOMATIC TOOL CHANGER								
Tool change system		Twin Arm	Twin Arm	Twin Arm	Twin Arm	Twin Arm	Twin Arm	Twin Arm
Tool storage capacity - Std.	Nos.	20 (2)	20 (2)	20 (2)	20 (2)	20 (2)	20 (2)	20 (2)
Pull stud		DIN 69872 / MAS 403	DIN 69872 / MAS 403	DIN 69872 / MAS 403	DIN 69872 / MAS 403	DIN 69872 / MAS 403	DIN 69872 / MAS 403	DIN 69872 / MAS 403
Max. tool dia with adjacent pockets full / empty	mm	63	63	80	80	80	80	125
Max. tool length	mm	200	200	250	250	250	250	350
Max. tool weight	kgf	3	3	8	8	8	8	15
Chip to chip time**	sec	3.9	3.9	5.9	4.8	4.8	4.8	6
Tool shank type - Std.		BT-30	BT-30	BT-40	BT- 40	BT- 40	BT - 40	BT- 50
- Opt.		BBT-30	BBT-30		HSK A63	HSK A63	HSK A63	HSK A100
CNC System - Std. FANUC								
		0iMF	0iMF	0iMF	0iMF	0iMF	0iMF	0iMF
- Opt. Siemens								
		828 D	828 D	-	-	-	-	-
INSTALLATION DATA								
Floor space	mm x mm	2000 x 2950	2200 x 2950	2000 x 3100	2000 x 3100	2300 x 3600	2400 x 3600	3000 x 4200
Machine height	mm	3100	3100	3450	3450	3450	3450	3800
Basic machine weight	kgf	5200	5500	6000	6000	7500	7500	10500
Power supply (Basic Machine)	kVA	23	25	25	25	40	40	80

** Valid for standard specifications *All specifications are subject to change without prior notice



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