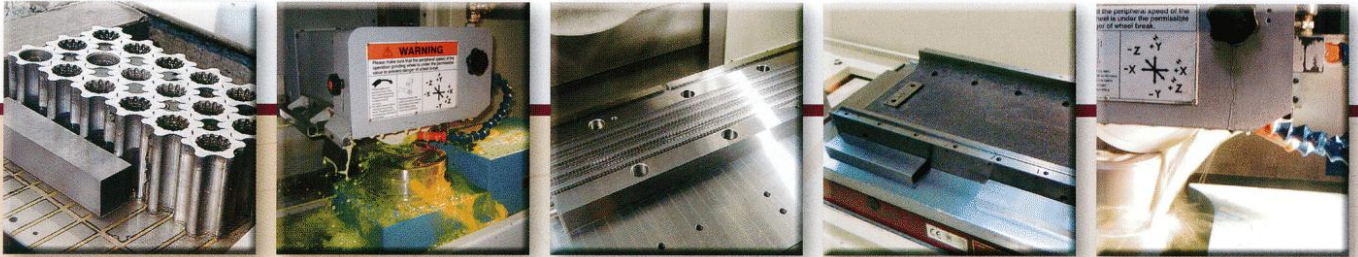


CHEVALIER®

Grinding / Turning / Milling



FSG-ADIII Series

Automatic Precision Surface
Grinding Machine

FSG-1224ADIII • 1632ADIII • 1640ADIII

FSG-1224ADIII • 1632ADIII • 1640ADIII

Machine Features

Automatic Precision Surface Grinding Machine - The highly advanced ADIII series of automatic precision surface grinding machines are a result of the ongoing and extensive research and development program at **CHEVALIER**. In addition to improved accuracy, quality, and machine life, the overall design of the machine incorporates ergonomics; all operating handwheels, levers, stroke setting devices and the pendant control panel are arranged to allow ease of operation, which increases working efficiency.

3-Axes Needle Roller Slide Way

All three axes guideway rails are composed of (S55C) steel that is normalized and then hardened by high frequency induction. The guideways are HRC 60-64 after heat treatment. Precision roller bearings run through a sieve to select exactly matched sets which are then preloaded between the linear guideway to provide a guideway system that will ensure excellent accuracy and precise positioning with stick-slip free movement.

Vertical Drive By AC Servo Motor

The wheelhead travelling on a preloaded linear guideway system is driven by a hardened and ground leadscrew and an AC servo motor providing high torque, speed and accurate positioning with a minimum increment of 0.001mm (0.00005"). A manual pulse generator(MPG) is standard for easy operation.

Crossfeed Speed Control

Saddle continuous movement speed is controlled by a AC servo motor for obtaining better grinding surface finish and dressing grinding wheel from table.

Inspection

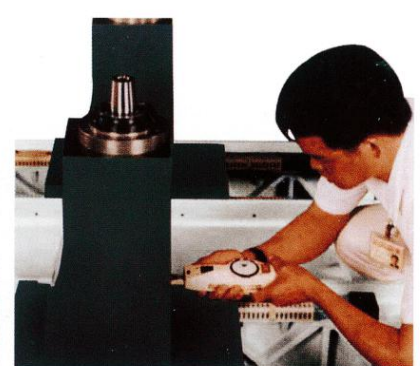
Driving Force Test -After the guide ways are assembled the resistance to movement on each axis is inspected to ensure that the proper preload is set and that friction is minimized, resulting in maximum life of the guide ways.



Driving force test on table



Driving force test on saddle



Driving force test on column

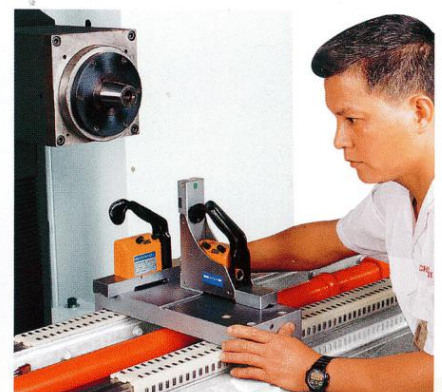
In Process Quality Control -To ensure the quality, accuracy, and longevity of our products, every technician follows step-by-step quality control procedures from casting to final product.



The column is placed on a granite surface plate and the perpendicularity of the guideways is inspected with a precision electro-indicator.



The parallelism of the wheelhead guideways is inspected with a precision electro-indicator.



Parallelism and flatness of the table guideways are checked by "In Process Quality Control". These and numerous other tests throughout production help to maintain and improve the quality of CHEVALIER grinders.

FSG-1224ADIII • 1632ADIII • 1640ADIII

Machine Features

Spindle Temperature Rise Test

To assure spindle temperature rise below 10°C , the spindle is tested under a non-load condition for a minimum of 8 hours. The spindle is run throughout its entire speed range while being continuously monitored by a thermograph.



Runout of Wheel Spindle Conical Surface

Apply a test indicator to the rear, middle and front points of the conical surface of the wheel spindle, and rotate the wheel spindle, the variation shall be under 0.0015mm ($0.00006''$).



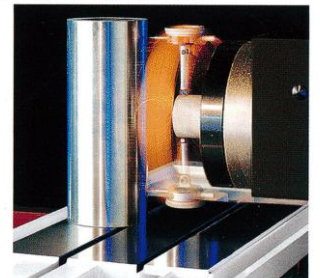
Spindle Dynamic Balancing Test

The spindle of each machine is calibrated by a portable precision dynamic vibration measuring device. The final amplitude of spindle vibration shall be under 0.03mm/s ($0.0012''/\text{s}$).



Parallelism and Squareness of Wheel Spindle Centerline to Table Surface

Place a cylinder gauge on the table, swing the test indicator which is fixed on the wheel spindle, and obtain the readings of the indicator when table is at its right, middle and left positions. The parallelism is 0.008mm ($0.0003''$) or less and the squareness is under 0.005mm ($0.0002''$).



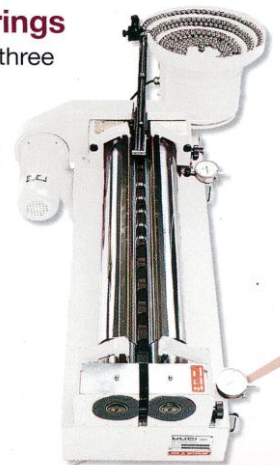
Parallelism of Table Surface to Table Cross Transverse

Attach the base of a test indicator to the wheel head. Touch the stylus of the indicator to the table surface. Traverse the table in and out. The indicator variation shall be within 0.004mm ($0.00016''$).



Sifting of Steel Roller Bearings

The steel roller bearings used in all three axes guideways are sieved by an automatic machine which assures the tolerance of the bearings within 0.001mm ($0.00004''$).



Parallelism of Table Surface to Table Longitudinal Movement

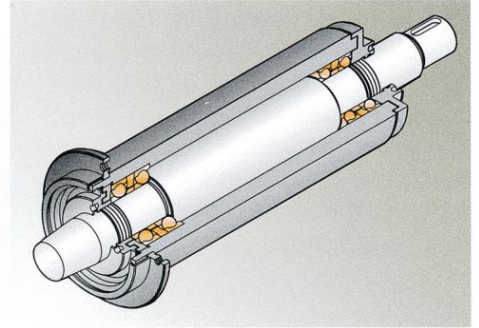
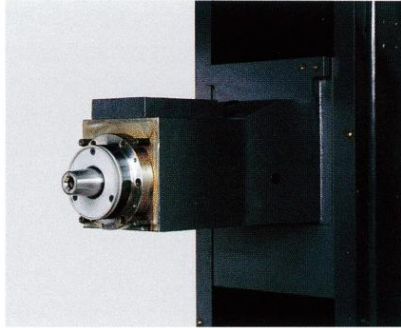
Attach the base of a test indicator to the wheel head. Touch the stylus of the indicator to the table surface. Move the table left to right and reverse, the indicator variation shall be within 0.004mm ($0.00016''$).



FSG-1224ADIII • 1632ADIII • 1640ADIII

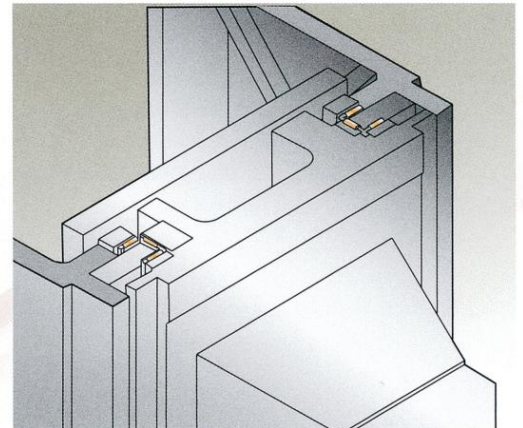
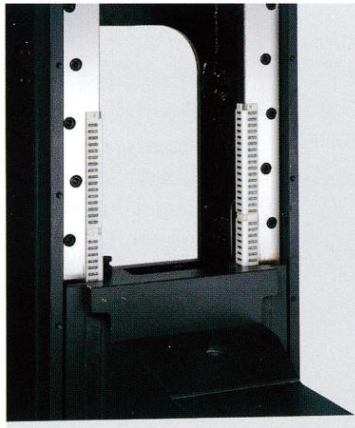
Machine Construction

Spindle - The spindle is supported by 4 Class 7(P4) super precision angular contact ball bearings which have been accurately measured, selected and preloaded, and then assembled in a temperature controlled clean room. The spindle is permanently lubricated and requires no maintenance. Spindle motor, spindle shaft, and couplings are precisely balanced to ensure accuracy and superb surface finish.



Elevating Guideway System -

The wheelhead and column system is composed of hardened and ground inserted steel guideways and precision roller bearings. The wheelhead and column guideways are preloaded providing zero clearance for precise straight line movement. The low friction wheelhead guideway system enables accurate feeds even at 0.001 mm (0.00005") increments. *



FSG-1224ADIII

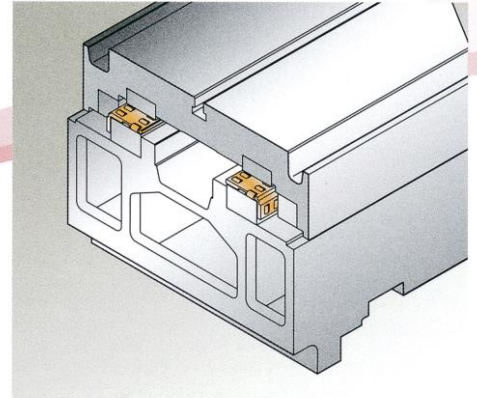
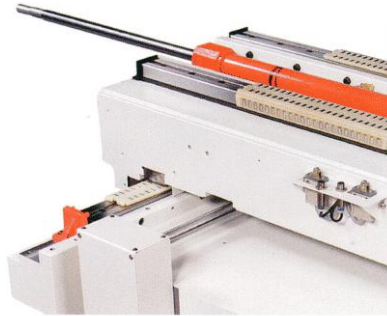
Note: Machine shown with optional accessories

FSG-1224ADIII • 1632ADIII • 1640ADIII

Machine Construction

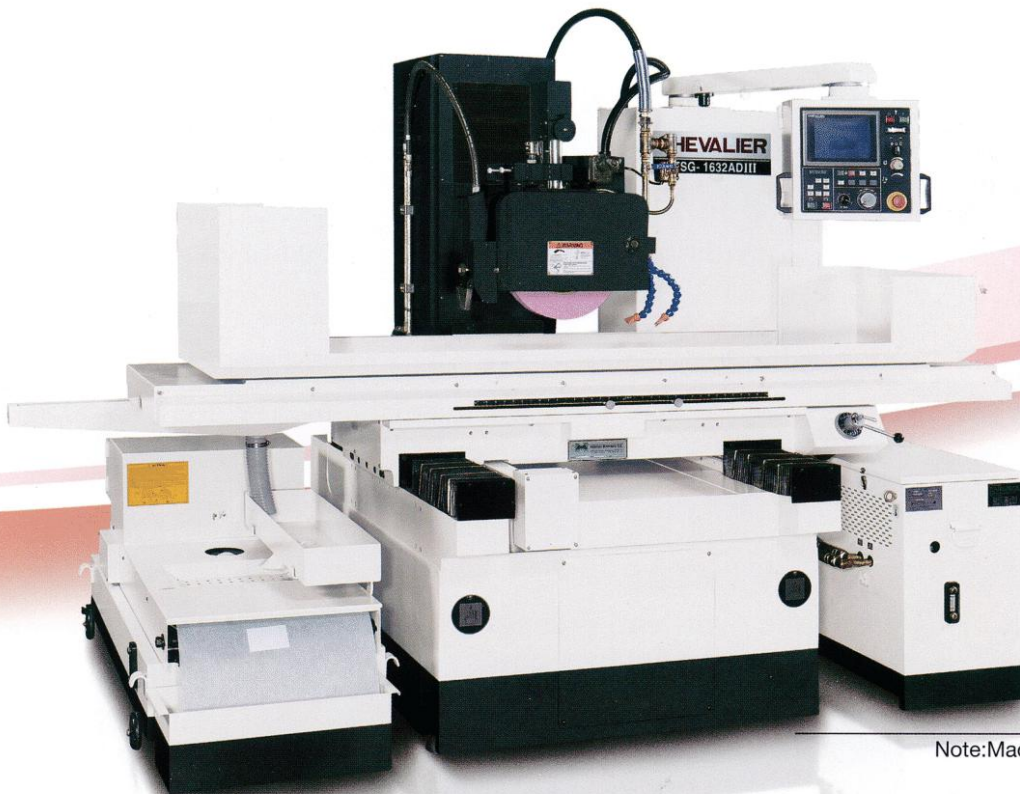
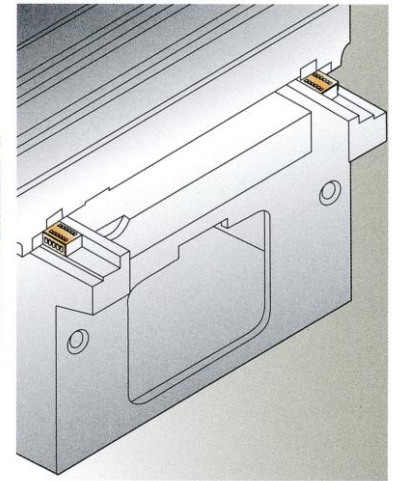
Table Guideway System -

The table guideway system is composed of hardened and ground steel guideways with precision needle roller bearings to provide excellent longevity and low friction, and also to provide precise linear movement without deviation, even during rapid traverse movement.



Saddle Guideway System -

The guideway system of the saddle is composed of specially designed preloaded needle roller bearings and hardened and ground slide rails. The roller bearings consist of independent loading and leading bearings. Loading bearings are to support the vertical load and preloaded leading bearings are to assure accuracy of the cross movement of saddle. The combination of these two features provide excellent longevity and low friction, stick-slip free accurate movement.



FSG-1632ADIII

Note: Machine shown with optional accessories

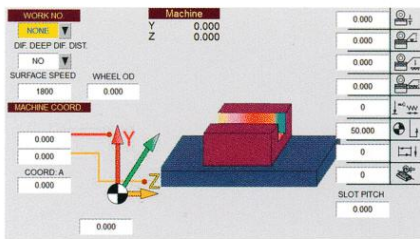
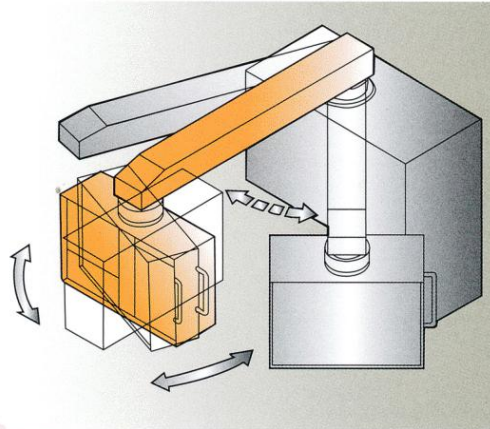
FSG-1224ADIII • 1632ADIII • 1640ADIII

Machine Features

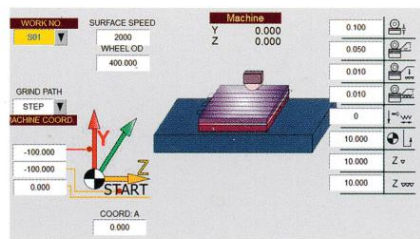
Control Station - The control station can be adjusted to a comfortable position for the operator. All switches, buttons, LEDs, indicating lamps, and displays are ergonomically positioned providing user friendly operation.

The control features are:

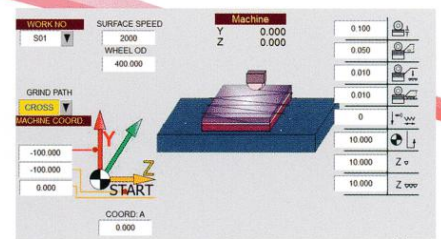
1. High reliability NC control platform.
2. 10.4" TFT high resolution 65,536 pixel color touch panel control interface.
3. Powerful graphic conversational function with surface/plunge standard built-in grinding program.
4. Brief and clear operation panel.
5. Machine abnormal alarm message display and alarm history record.
6. Y axis home positioning function.
7. Multi-language support available.
8. Mechanical coordinates and relative coordinates display.
9. Digital I/O check mode makes service system more efficient.
10. Operation friendly, grinding, wheel dressing and automatic compensation can be accomplished easily without making CNC program.



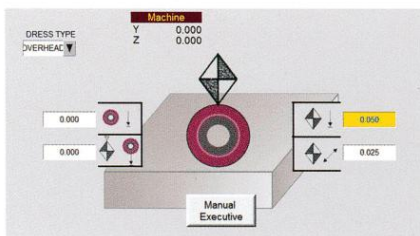
Plunge Grinding Mode



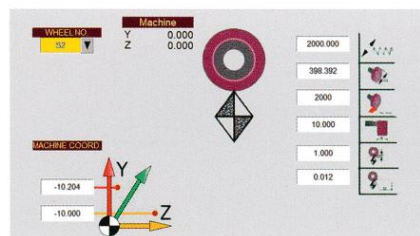
Surface Grinding Mode



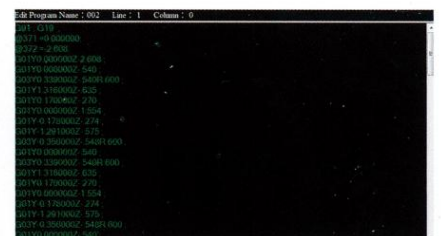
Crisscross Grinding (optional)



Semi Automatic Dressing on Table



Automatic overhead dresser with compensation (optional)



Program edit screen (optional)

FSG-1224ADIII • 1632ADIII • 1640ADIII

Optional Accessories



• **Machine Lamp**
(12V, 50W)



• **Auto Wheel Balancing System(SBS)**



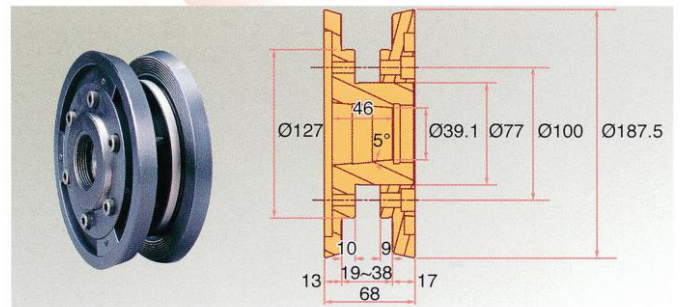
• **Single Face Dresser**



• **Parallel Dressing Attachment (Manual Type)**



• **Universal Wheel Guard and Nozzle**
Suitable for : 356mm (14") grinding wheel



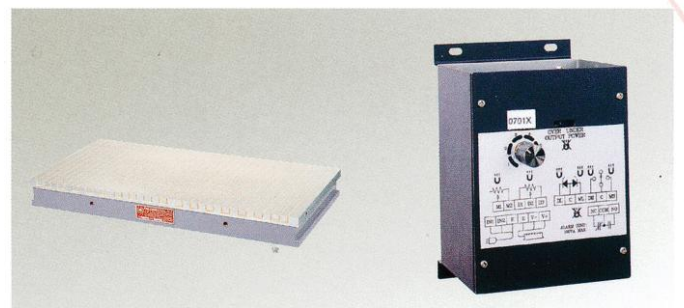
• **Wheel Flange**
Clamping Width : 19~38mm (0.75"~1.5")



• **Balancing Stand with Levelling Bubble**
Max. Dia. : 355mm (14")
Max. Width : 50mm (2")



• **Balancing Stand (Roller Type)**
Suitable for :
203~355mm (8"~14") grinding wheel



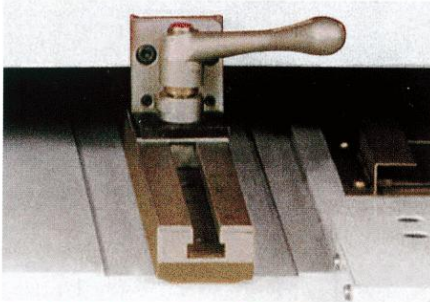
• **Electromagnetic Chuck** • **Chuck Controller**
300 x 600mm (11 3/4" x 23 5/8") Input Voltage : 140VAC
400 x 800mm (15 3/4" x 31 1/2") Output Voltage : 110VDC
400 x 1,000mm (15 3/4" x 39 3/8")
Voltage : 110VDC

*Chuck Control is required for all of the above.

Note: Items marked with • are recommended to be factory installed

FSG-1224ADIII • 1632ADIII • 1640ADIII

Optional Accessories



Saddle Locking Device

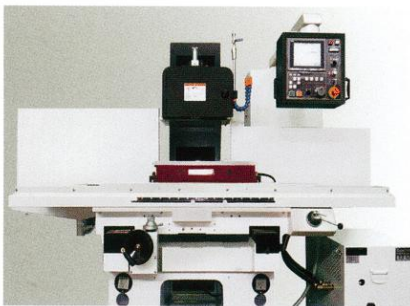


Frequency Converter for Spindle

5HP(Voltage : 400V)
5HP(Voltage : 200V)

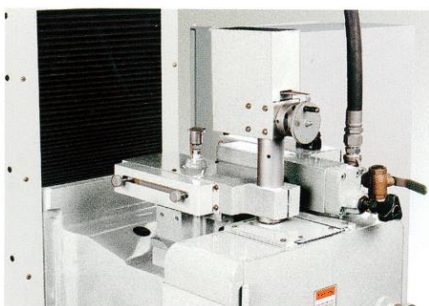


• **Single Side Water Baffle**



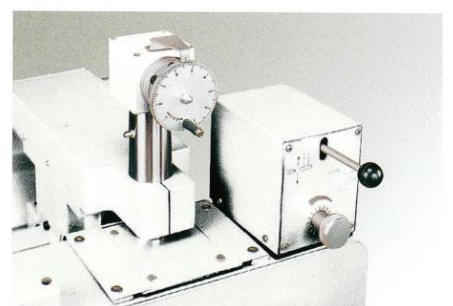
• **Double side water baffle**

Z axis travel is reduced by 20mm (4/5") and max. manual travel is reduced by 35mm (1 3/8")



Over-The-Wheel Auto. Straight Line Dressing & Compensation Device

Suitable for : 355mm (14") Grinding Wheel Dressing Width : 70mm (2.75")



• **Parallel Dressing Attachment (Hydraulic)**

Suitable for : 355mm (14") Grinding Wheel Dressing Width : 70mm (2.75")



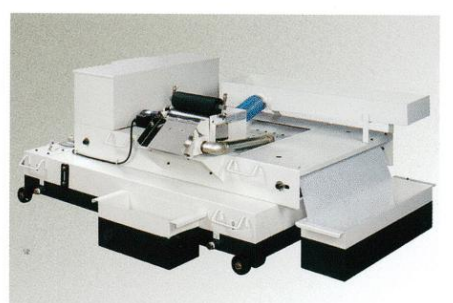
• **Dust Collector**

Suction Motor : 1/2HP, 2P
Space : 470 x 500mm (18 1/2" x 19 11/16")
Height : 585mm (23")



Coolant System With Double Filter

Volume : 95L
Pump : 1/8HP
Coolant Capacity : 20L/min.
Space : 660 x 480mm (26" x 19")
Height : 610mm (24")



Coolant System With Auto. Paper Feeding Device and Magnetic Separator (with 1 Roll of Paper)

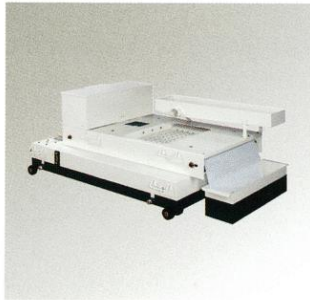
Volume : 120L
Paper feeding motor : 25W
Pump : 1/8HP
Coolant Capacity : 20L/min.
Space : 1,450 x 620mm (57" x 24 3/8")
Height : 760mm (30")

FSG-1224ADIII • 1632ADIII • 1640ADIII

Optional Accessories

Coolant System With Auto. Paper Feeding Device (with 1 Roll of Paper)

Volume : 120L
 Paper feeding motor : 25W
 Pump : 1/8HP
 Coolant Capacity : 20L/min.
 Space : 1,450 x 620mm
 (57" x 24 3/8")
 Height : 760mm(30")



Coolant System With Manual Paper Feeding Device

Volume : 85L
 Pump : 1/8HP
 Coolant Capacity : 20L/min.
 Space : 550 x 1,000mm
 (21 21/32" x 39 3/8")
 Height : 775mm(30 1/2")



Standard Accessories

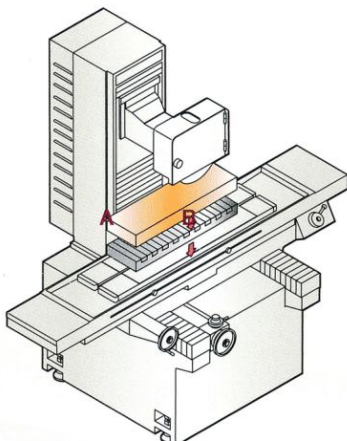
1. Tool box
- 2. Touch-up paint
- 3. Balancing arbor
- 4. Wrench
- 5. Hex. wrench(14mm)
- 6. Diamond dresser with diamond(B03-0401)
7. Wheel flange
8. Grinding wheel
9. Splash guard
10. Levelling pads
11. Levelling screws & nuts
- 12. Hex. wrench
- 13. Hole plugs



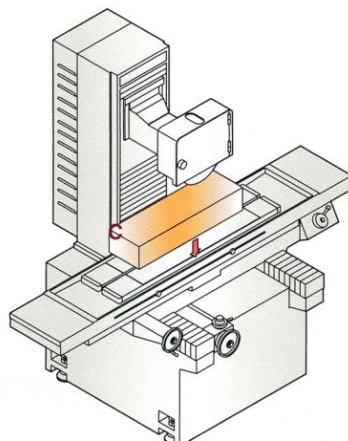
Note: The items marked with • are stored in tool box.

Permissible Load of Machine

Unit : Kg (lbs.)



Grinding with Magnetic Chuck



Grinding without Magnetic Chuck

The total suggested maximum workloads of table are shown as follows:

A=Workpiece B=Magnetic Chuck C=A+B

MODEL	FSG-1224ADIII	FSG-1632ADIII	FSG-1640ADIII
A	314 (690)	403 (886)	423 (930)
B	106 (233)	197 (433)	247 (543)
C	420 (923)	600 (1,319)	670 (1,473)

FSG-1224ADIII • 1632ADIII • 1640ADIII

Specification

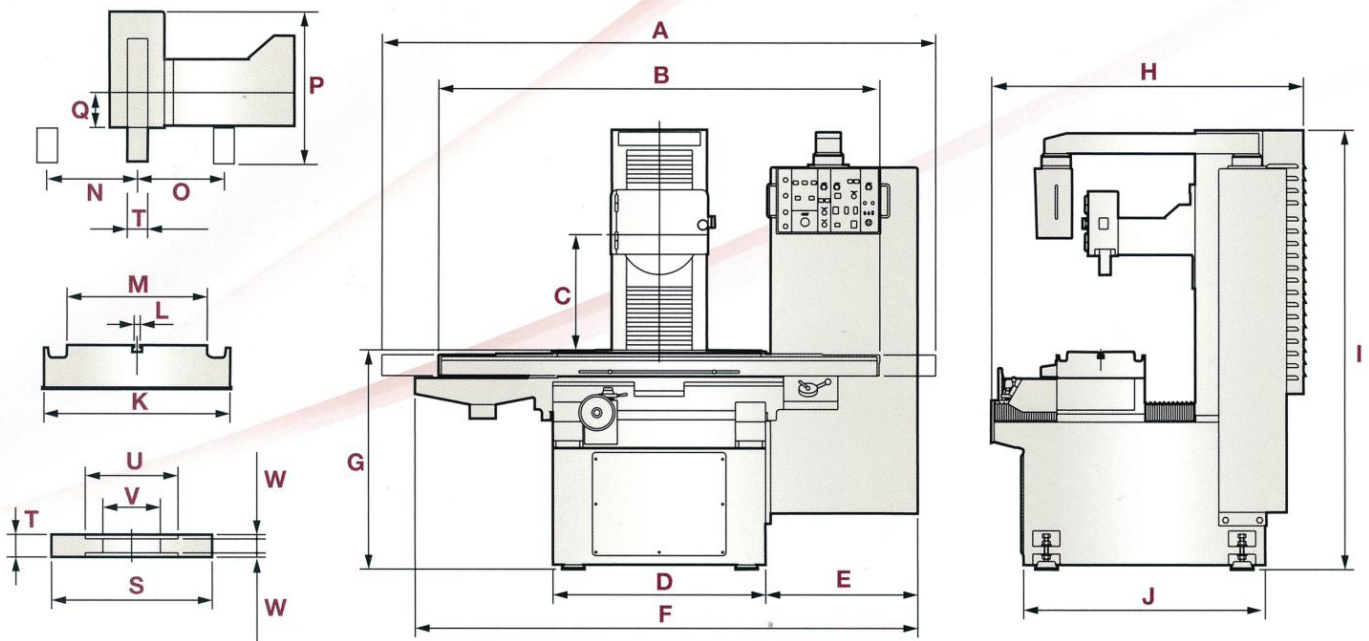
Unit : mm (")

Description		FSG-1224ADIII	FSG-1632ADIII	FSG-1640ADIII
Table Size		300 x 600 (11 3/4" x 23 5/8")	400 x 800 (15 3/4" x 31 1/2")	400 x 1,000 (15 3/4" x 39 3/8")
Max. grinding length	Longitudinal	610 (24")	810 (32")	1,015 (40")
Max. grinding width	Crosswise	305 (12")	405 (16")	
Max.distance from table surface to spindle centerline		610 (24")		
Standard magnetic chuck size		300 x 600 (11 3/4" x 23 5/8")	400 x 800 (15 3/4" x 31 1/2")	400 x 1,000 (15 3/4" x 39 3/8")
Longitudinal movement of table	Longitudinal travel, hydraulic	650 (25 5/8")	850 (33 7/16")	1,050 (41 5/16")
	Maximum travel, manual	700 (27 1/2")	900 (35 3/8")	1,100 (43 1/4")
	Table speed (stepless)	5~25m/min. (16~82fpm)		
Cross movement of table	Rapid travel (approx.)	0~2,250m/min (0~99ipm)		
	Automatic transverse increment	3~32 (1/8"~1 1/4")		
	Maximum manual travel	350 (13.8")	460 (18.1")	
		Optional 315 (12.4") (with double side water baffle)	Optional 425 (16.7") (with double side water baffle)	
	Mini input	0.001 (0.0001")		
Wheelhead vertical infeed	Automatic infeed	0.001~0.04 (0.00005"~0.002")		
	Rapid travel (approx.)	500m/min. (25 ipm)		
	Mini input	0.0001 (0.00001")		
Grinding Spindle drive	Speed	60Hz/1,750rpm, 50Hz/1,450rpm		
	Power rating	5HP/4P		
Standard grinding wheel	Diameter	355 (14")		
	Width	50 (2") Double Recess		
	Bore	127 (5")		
Hydraulic system	Power rating	1HP/6P	2HP/6P	
Crossfeed drive	Power rating	AC servo 1kW		
Elevating drive	Power rating	AC servo 1kW		
Floor Space	Total space required	2,950 x 1,490 x 2,080 (116" x 59" x 81 7/8")	3,540 x 1,730 x 2,080 (139 3/8" x 68" x 81 7/8")	4,280 x 1,730 x 2,080 (168 1/2" x 68" x 81 7/8")
Weights	Net weight approx.	2,200Kgs (4,840 lbs.)	2,900Kgs (6,380 lbs.)	3,500Kgs (7,700 lbs.)
	Gross weight approx.	2,700Kgs (5,940 lbs.)	3,550Kgs (7,810 lbs.)	4,200kgs (9,240 lbs.)
Rated power, approx.		5.6kW (7.5HP)	6.3kW (8.5HP)	
Packing dimensions (LxWxH)		2,720 x 1,760 x 2,235 (107" x 69.5" x 88")	2,840 x 2,020 x 2,235 (112" x 79.5" x 88")	3,200 x 2,040 x 2,235 (126" x 80.5" x 88")

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms... etc. of the machine without prior notice. All content is for reference only and may be subject to change without notice or obligation.

FSG-1224ADIII • 1632ADIII • 1640ADIII

Dimensional Drawings



Unit : mm (")

Description	FSG-1224ADIII	FSG-1632ADIII	FSG-1640ADIII
A	2,950 (116")	3,540 (139 3/8")	4,280 (168 1/2")
B	2,150 (84 21/32")	2,560 (100 3/4")	3,000 (118")
C	610 (24 7/16")		
D	940 (37")	1,600 (63")	1,600 (63")
E	600 (23 3/5")		300 (11 4/5")
F	2,430 (95 7/8")	2,840 (111 3/4")	3,480 (137 1/8")
G	970 (38 3/16")	980 (38 19/32")	
H	1,490 (58 3/32")	1,733 (68 7/32")	
I	2,080 (81 7/8")		
J	1,070 (42")	1,311 (51 5/8")	
K	390 (15 11/31")	500 (19 11/16")	
L	14 (9/16")		
M	305 (12")	405 (15 3/4")	
N	180 (7")	240 (9 1/2")	
O	190 (7 7/16")	240 (9 1/2")	
P	386 (15 3/16")		
Q	86 (3 3/8")		
S	355 (14")		
T	50 (2")		
U	205 (8")		
V	127 (5")		
W	9.5 (3/8")		



Grinding Machine



Grinding Machine



Turning Machine



Milling Machine

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