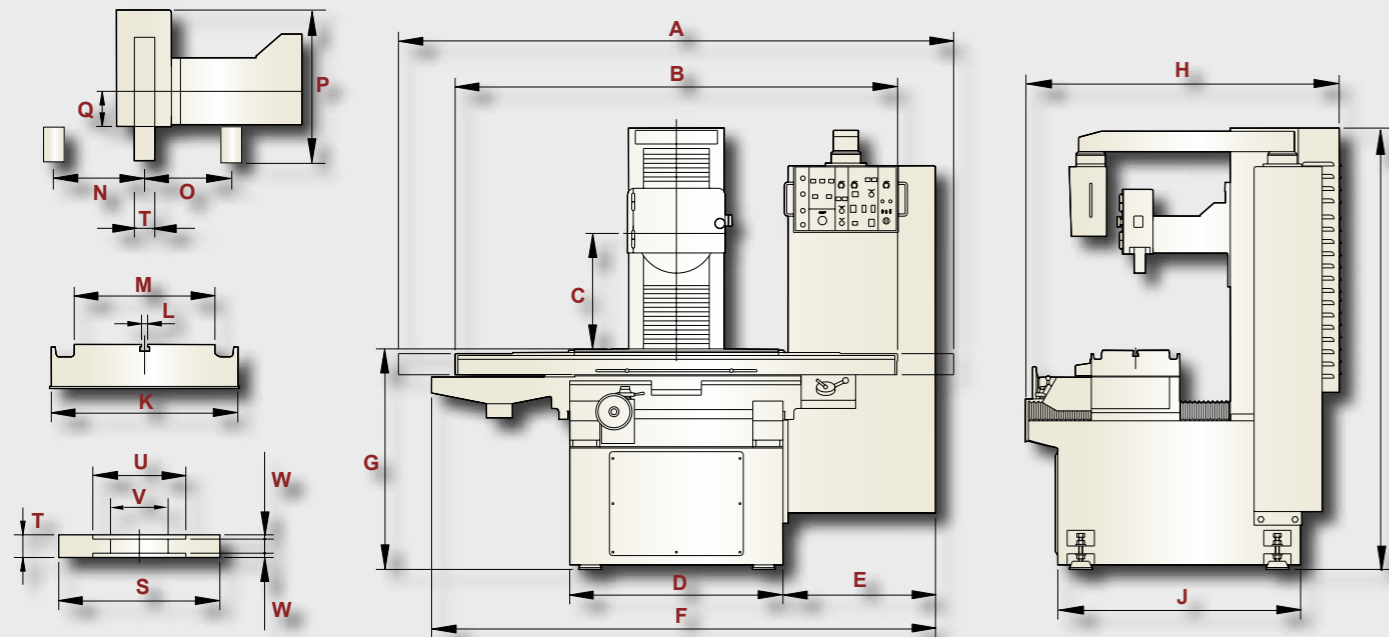


DIMENSIONAL DRAWINGS



Description	FSG-1224ADII	FSG-1632ADII	FSG-1640ADII
A	116"(2950mm)	139 3/8"(3540mm)	168 1/2"(4280mm)
B	84 21/32"(2150mm)	100 3/4"(2560mm)	118"(3000mm)
C		24 7/16"(620mm)	
D	37"(940mm)	63"(1600mm)	63"(1600mm)
E		23 3/5"(600mm)	11 4/5"(300mm)
F	95 7/8"(2430mm)	111 3/4"(2840mm)	137 1/8"(3480mm)
G	38 3/16"(970mm)		38 19/32"(980mm)
H	58 3/32"(1490mm)		68 7/32"(1733mm)
I		81 7/8"(2080mm)	
J	42"(1070mm)		51 5/8"(1311mm)
K	15 11/31"(390mm)		19 11/16"(500mm)
L		9/16"(14mm)	
M	11 3/4"(305mm)		15 3/4"(405mm)
N	7"(180mm)		9 1/2"(240mm)
O	7 7/16"(190mm)		9 1/2"(240mm)
P		15 3/16"(386mm)	
Q		3 3/8"(86mm)	
S		14"(355mm)	
T		2"(50mm)	
U		8"(205mm)	
V		5"(127mm)	
W		3/8"(9.5mm)	

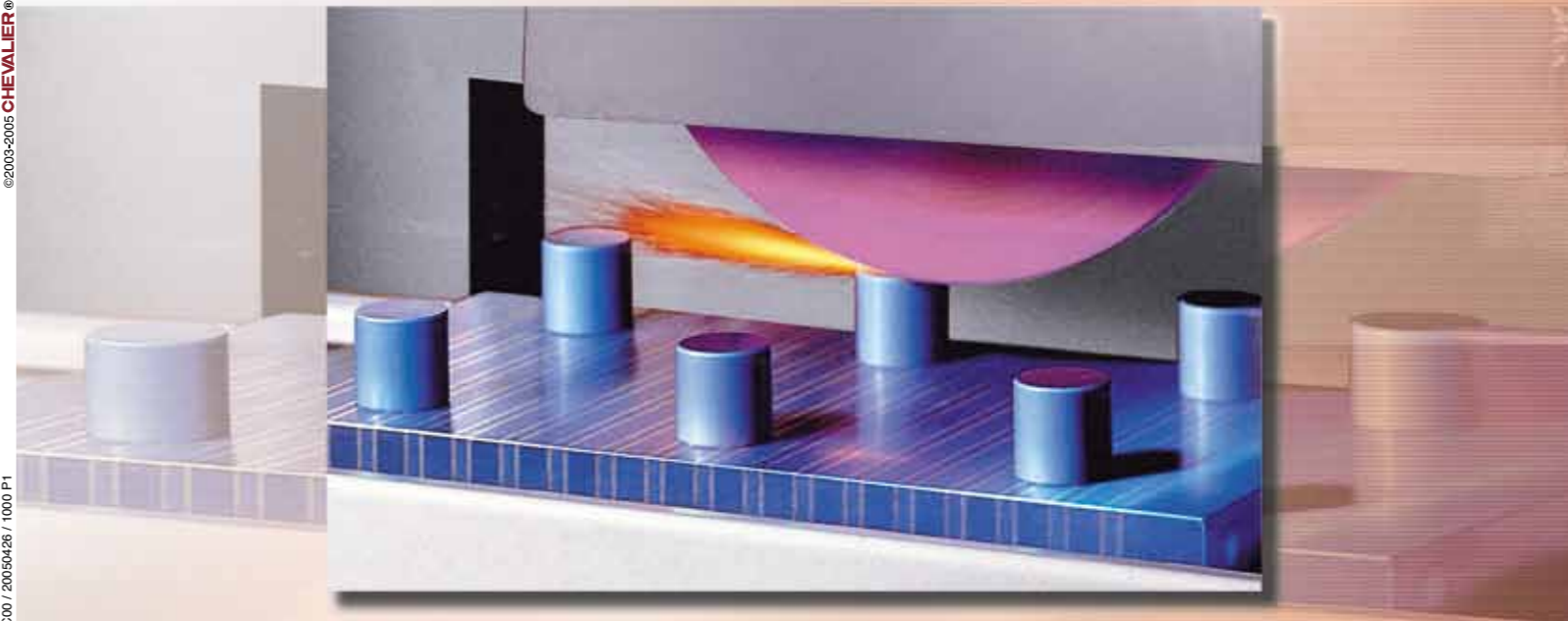
CHEVALIER®

FSG-1224ADII/1632ADII /1640ADII

AUTOMATIC PRECISION SURFACE GRINDING MACHINE

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FSG-12/16ADII Series

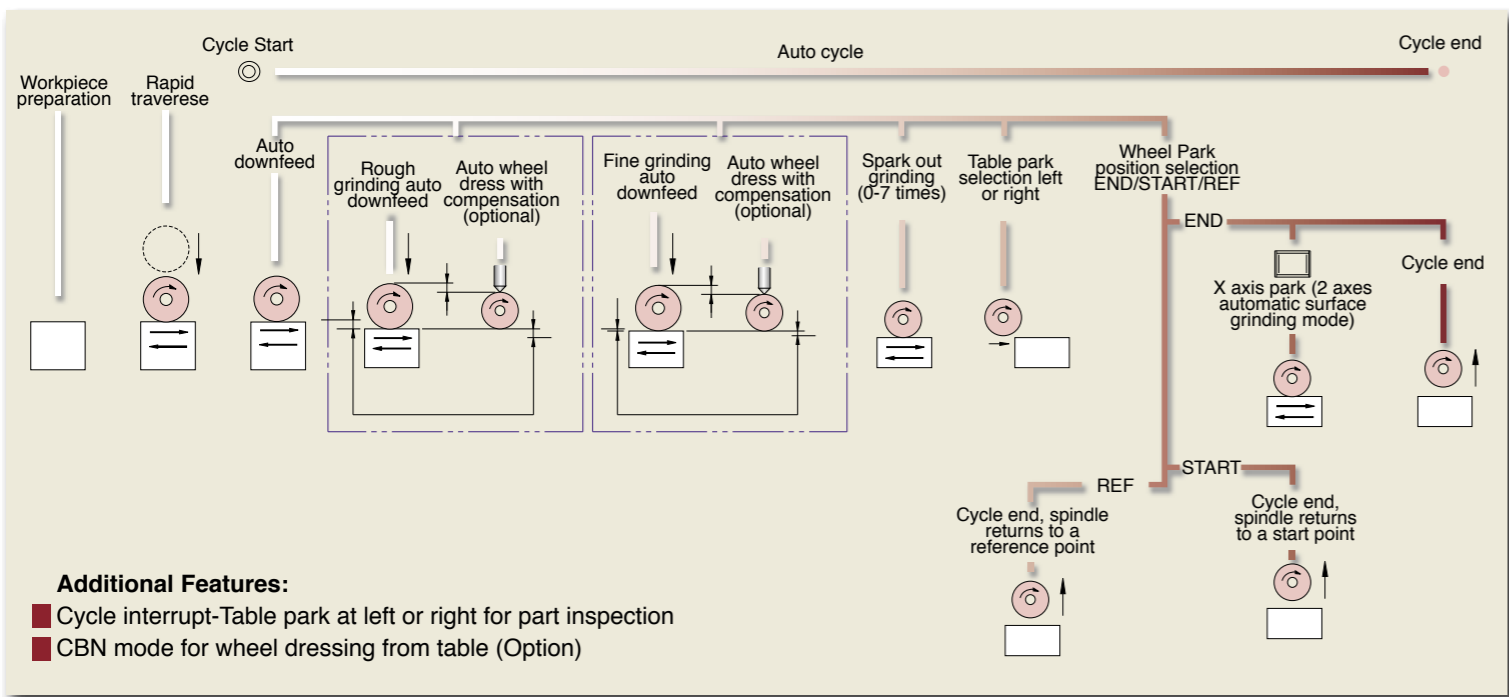
FSG-1224ADII • 1632ADII • 1640ADII
AUTOMATIC PRECISION SURFACE GRINDING MACHINE

The highly advanced ADII 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 accuracies, 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. Therefore, working efficiency is increased.

3 AXES NEEDLE ROLLER SLIDE WAY

All three axes guideway rails are composed of (S55C) steel that is normalized then hardened by high frequency induction. The guideways are HRC 60-64 after heat treating. 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.

Grinding flow chart



AC SERVO VERTICAL DRIVE

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 0.0001" (0.001mm). A manual pulse generator (MPG) is standard for easy operation.

CROSSFEED SPEED CONTROL (OPTION)

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

Spindle Temperature Rise Test

To assure spindle temperature rise below 10°C, the spindle is tested under a no 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 0.00006" (0.0015mm).



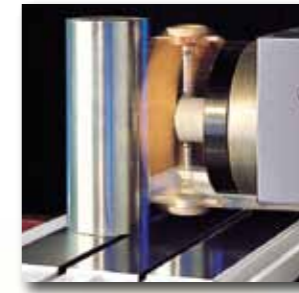
Spindle Dynamic Balancing Test

The spindle of each machine is calibrated by a portable precision dynamic vibration measuring device. The final amplitude of spindle vibration shall be under 0.0012"/s (0.03mm/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 0.0003" (0.008mm) or less and the squareness is under 0.0002" (0.005mm).



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 0.00016" (0.004mm).



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 0.00004" (0.001mm).



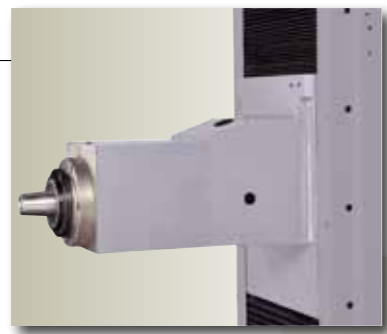
Parallelism of Table Surface to Table Longitudinal Movement

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 0.00016" (0.004mm).



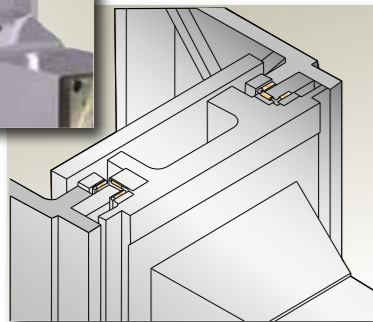
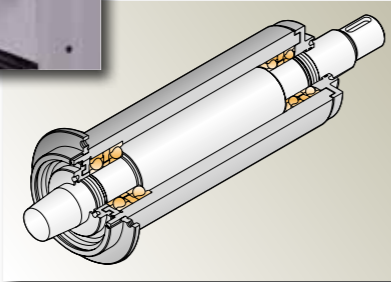
Spindle

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 finishes.



Elevating Guideway System

The wheelhead and column way 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 0.000050"(0.001mm) increments while providing extended way life.



FSG-12/16ADII Series

AUTOMATIC PRECISION SURFACE GRINDING MACHINE



FSG-1224ADII

Note: Machine shown with optional accessories



FSG-1632ADII

Note: Machine shown with optional accessories



FSG-1640ADII

Note: Machine shown with optional accessories

ASSEMBLY

Driving Force Test

After the guide ways assembled, resistance to movement on each axis is inspected to ensure that the proper preload is set and that friction is minimized, resulting in maximum way life.



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.



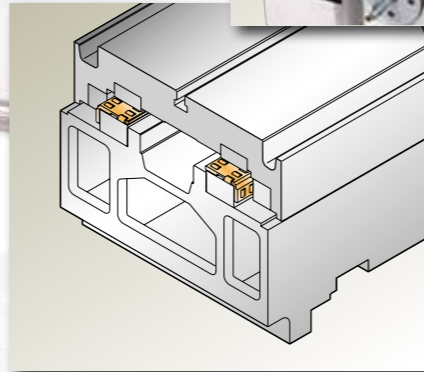
The parallelism of the wheelhead guideways is inspected with a precision electro-indicator.



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

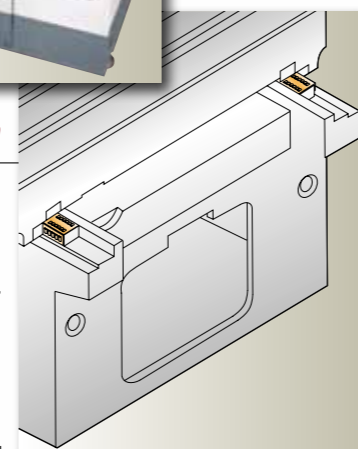
Table Guideway System

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.



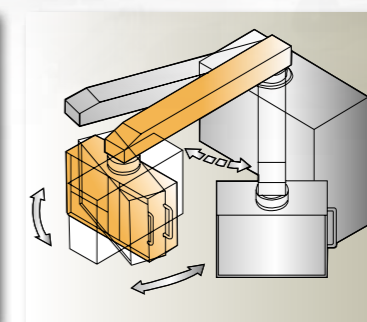
Saddle Guideway System

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.



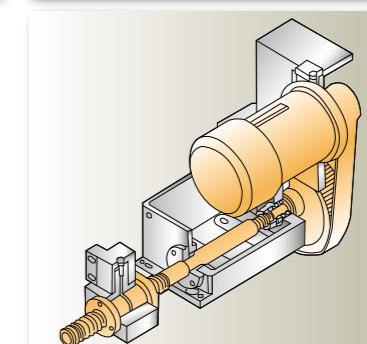
Control Station

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.



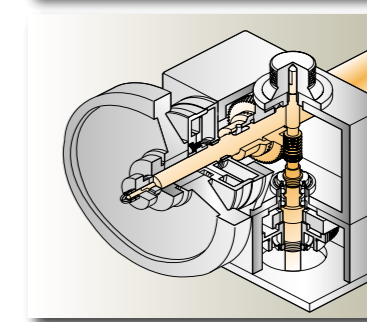
Crossfeed Transmission

The saddle incorporates a specially designed play-compensating feed nut & hardened and ground leadscrew, resulting in the elimination of backlash. Therefore, high accuracy results can be obtained during such operations as plunge grinding.



Micro Crossfeed Device

The micro crossfeed device consists of a worm and worm gear. Turn the lever clockwise to engage the worm and worm gear for fine adjustment at increments of 0.00005"(0.001mm). Once the worm and wormgear are engaged, the cross powerfeed motor and the cross handwheel are automatically.



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



MACHINE LAMP
B01-0903 (12V, 50W)
12/16 SERIES



GRINDING WHEEL
DYNAMIC BALANCING SYSTEM
• B44-0401



CHUCK CONTROLLER
• B23-0701
• B23-0703
Input Voltage: 140VAC
Output Voltage: 110VDC



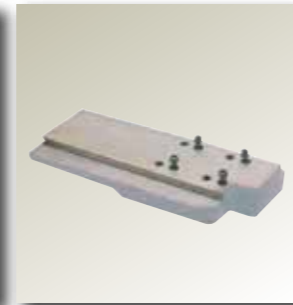
WHEEL FLANGE
B05-0401
(12/16SERIES) Suitable
for 14"x2"x5"
(355x50x127mm)
grinding wheel

PARALLEL DRESSING ATTACHMENT (MANUAL TYPE)

- B13-0902 (12 SERIES)
 - B13-0504 (16 SERIES)
- Suitable for 14" (356mm) grinding wheel



DUAL FACE DRESSER
• B13-0302 (12,16 SERIES)
Max Angle : 90°
Min Angle : 90°
Max Length : 4.3"(110mm)



ADAPTER FOR MOUNTING DIAFORM DRESSER
B41-0401 (12 SERIES)
B41-0402 (16 SERIES)



UNIVERSAL WHEEL GUARD & NOZZLE
B41-0409 (12 SERIES)
B41-0410 (16 SERIES)



BALANCING STAND WITH LEVELLING BUBBLE
B15-0301
Max. Dia : 14"(355mm)
Max. Width : 2"(50mm)



BALANCING STAND (ROLLER TYPE)
B15-0601
Suitable for :
8"-14"(203~355mm)
grinding wheel



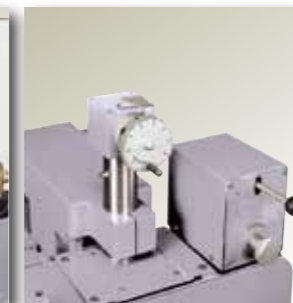
SINGLE FACE DRESSER
• B13-0301



ELECTROMAGNETIC CHUCK
B09-04011 (1224)
11 3/4"x23 5/8"(300x600mm)
B09-04051 (1632)
15 3/4"x31 1/2"(400x800mm)
B09-04061 (1640)
15 3/4"x39 3/8"(400x1000mm)
Voltage : 110VDC
*Chuck Control is required for all of the above.



OVER-THE-WHEEL AUTO. STRAIGHT LINE DRESSING & COMPENSATION DEVICE
B13-0406 (12 SERIES)
B13-0409 (16 SERIES)



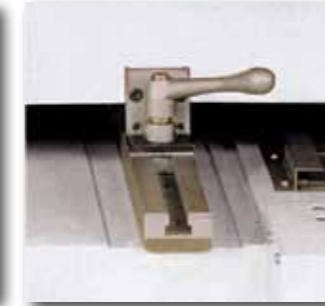
PARALLEL DRESSING ATTACHMENT (HYDRAULIC)
• B13-0401 (12 SERIES)
• B13-0405 (16 SERIES)
Suitable for : 14"(355mm) grinding wheel



ROTARY DIAMOND DRESSER
• B13-0306 (12 SERIES)
• B13-0307 (16 SERIES)
Rapid Elevating Power: 40W
Dressing Power: 100W
Auto Infeed: 0.00005" (0.001mm)
Roller(optional): Ø4"x2"xØ1"
(Ø100x50xØ25mm)



SINGLE SIDE WATER BAFFLE
• B19-0401 (1224)
• B19-0405 (1632)
• B19-0406 (1640)



SADDLE LOCKING DEVICE
B40-0404 (12 SERIES)
B40-0405 (16 SERIES)



FREQUENCY CONVERTER FOR SPINDLE
B48-0402 (12,16 SERIES)
5HP(Voltage : 400V)
B48-0403 (12,16 SERIES)
5HP(Voltage : 200V)



DUST COLLECTOR
• B17-0102
Suction Motor : 1/2HP,2P
Space : 18 1/2"x19 11/16"
(470x500mm)
Height : 23"(585mm)



COOLANT SYSTEM WITH DOUBLE FILTER
B17-0901
Volume : 95L
Pump : 1/8HP
Coolant Capacity : 20L/min
Space : 26"x19"(660x480mm)
Height : 24"(610mm)



COOLANT SYSTEM WITH AUTO. PAPER FEEDING DEVICE & MAGNETIC SEPARATOR (WITH 1ROLL OF PAPER)
B17-0302
Volume : 120L
Paper feeding motor : 25W
Pump : 1/8HP
Coolant Capacity : 20L/min
Space : 57"x24 3/8"(1450x620mm)
Height : 30"(760mm)

Other Optional Accessories

1. Ballscrew instead of leadscrew on crossfeed transmission
2. Creepfeed mechanism on table (table speed 0.032 fpm or 10mm/min, with hydraulic oil cooling system).
3. CBN mode (Variable continuous saddle movement speed) and crisscross mode with frequency converter
4. Double side water baggle

STD. ACCESSORIES

1. Tool box
2. Touch-up paint
3. Balancing arbor
4. Wrench
5. Hex. wrench
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. Fuse
14. Hole plugs

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

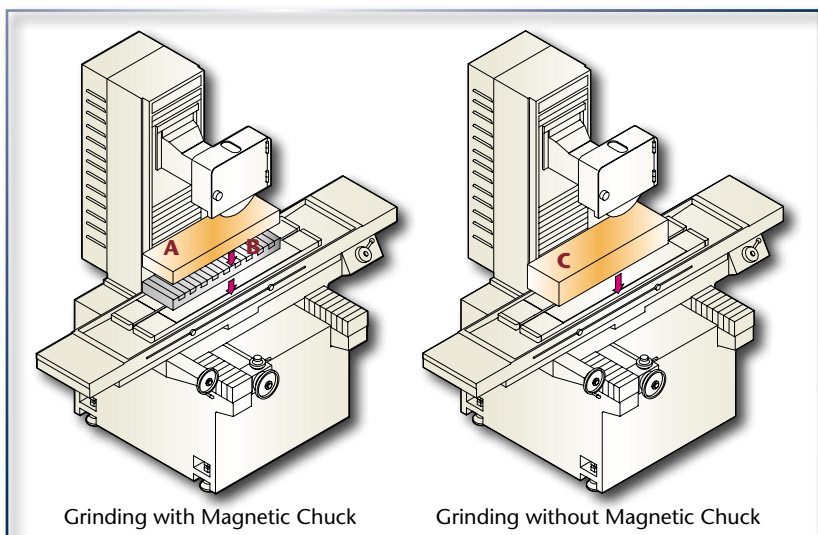


SPECIFICATION

Description		FSG-1224ADII	FSG-1632ADII	FSG-1640ADII
Table Size		11 3/4x23 5/8" (300x600mm)	15 3/4"x31 1/2" (400x800mm)	15 3/4"x39 3/8" (400x1000mm)
Max. grinding length	Longitudinal	24"(610mm)	32"(810mm)	40"(1015mm)
Max. grinding width	Crosswise	12"(305mm)	16"(405mm)	
Max. distance from table surface to spindle centerline			24 7/16"(620mm)	
Standard magnetic chuck size		11 3/4x23 5/8" (300x600mm)	15 3/4"x31 1/2" (400x800mm)	15 3/4"x39 3/8" (400x1000mm)
Longitudinal movement of table	Longitudinal travel, hydraulic	25 5/8"(650mm)	33 7/16"(850mm)	41 5/16"(1050mm)
	Maximum travel, manual	27 1/2"(700mm)	35 3/8"(900mm)	43 1/4"(1100mm)
	Longitudinal travel, hydraulic		16~82fpm(5~25m/min)	
Cross movement of table	Rapid travel, approx.	60Hz/12fpm(3.5m/min), 50H/10fpm(2.9m/min)		
	Automatic transverse increment	1/8"~1 1/4"(3~32mm)		
	Maximum automatic travel	12"(305mm)	16"(405mm)	
	Maximum manual travel	13 3/4"(350mm)	18"(460mm)	
	Handwheel per revolution		0.25"(6mm)	
	Handwheel per graduation		0.0025"(0.1mm)	
	Micro Feed per graduation		0.005"(0.1mm)	
	Micro Feed per graduation		0.00005"(0.001mm)	
Wheelhead vertical infeed	Automatic infeed	0.00005"~0.002"(0.001~0.04mm)		
	Rapid travel, approx.	25ipm(500 mm/min)		
Grinding Spindle drive	Speed	60Hz/1750rpm, 50Hz/1450rpm		
	Power rating	5HP/4P		
Standard grinding wheel	Diameter	14"(355mm)		
	Width	2"(50mm)		
	Bore	5"(127mm)		
Hydraulic system	Power rating	1HP/6P	2HP/6P	
Crossfeed drive	Power rating	1/6"HP/4P		
Elevating drive	Power rating	AC servo 1kw		
Floor Space	Total space required	116"x59"x81 7/8" (2950x1490x2080mm)	139 3/8"x68"x81 7/8" (3340x1730x2080mm)	168 1/2"x86"x81 7/8" (4280x1730x2080mm)
Weights	Net weight approx.	4849 lbs(2200kgs)	6394 lbs(2900kgs)	7710 lbs(3500kgs)
	Gross weight approx.	5951 lbs(2700kgs)	7862 lbs(3550kgs)	9240 lbs(4200kgs)
Rated power, approx.		5.6kw(7.5HP)		6.3kw(8.5HP)
Packing dimensions (LxWxH)		107"x69.5"x88" (2720x1760x2235mm)	112"x79.5"x88" (2840x2020x2235mm)	126"x80.5"x88" (3200x2040x2235mm)

※ Note: The manufacturer reserves the right to modify the design, specifications, mechanisms... etc. of the machine without prior notice.
All the specifications shown above are just for reference.

PERMISSIBLE LOAD OF MACHINE



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-1224ADII	FSG-1632ADII	FSG-1640ADII
A lbs(kg)	690(314)	946(403)	930(423)
B lbs(kg)	230(106)	433(197)	543(247)
C lbs(kg)	924(420)	1320(600)	1474(670)