**Description**

<table>
<thead>
<tr>
<th>Description</th>
<th>FSG-1224ADII</th>
<th>FSG-1632ADII</th>
<th>FSG-1640ADII</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>116&quot; (2950mm)</td>
<td>139 3/8&quot; (3540mm)</td>
<td>168 1/2&quot; (4280mm)</td>
</tr>
<tr>
<td>B</td>
<td>84 21/32&quot; (2150mm)</td>
<td>106 3/4&quot; (2680mm)</td>
<td>118&quot; (3000mm)</td>
</tr>
<tr>
<td>C</td>
<td>37&quot; (940mm)</td>
<td>63&quot; (1600mm)</td>
<td>63&quot; (1600mm)</td>
</tr>
<tr>
<td>D</td>
<td>23 1/5&quot; (600mm)</td>
<td>31 1/4&quot; (800mm)</td>
<td>31 1/4&quot; (800mm)</td>
</tr>
<tr>
<td>E</td>
<td>95 7/8&quot; (2430mm)</td>
<td>111 3/4&quot; (2840mm)</td>
<td>137 1/8&quot; (3480mm)</td>
</tr>
<tr>
<td>F</td>
<td>38 1/16&quot; (970mm)</td>
<td>38 19/32&quot; (980mm)</td>
<td>38 19/32&quot; (980mm)</td>
</tr>
<tr>
<td>G</td>
<td>38 3/16&quot; (990mm)</td>
<td>68 7/32&quot; (1733mm)</td>
<td>68 7/32&quot; (1733mm)</td>
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<tr>
<td>H</td>
<td>42&quot; (1070mm)</td>
<td>81 7/8&quot; (2080mm)</td>
<td>81 7/8&quot; (2080mm)</td>
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<tr>
<td>I</td>
<td>15 11/31&quot; (390mm)</td>
<td>15 11/31&quot; (390mm)</td>
<td>19 11/31&quot; (500mm)</td>
</tr>
<tr>
<td>J</td>
<td>11 3/4&quot; (305mm)</td>
<td>15 3/4&quot; (405mm)</td>
<td>15 3/4&quot; (405mm)</td>
</tr>
<tr>
<td>K</td>
<td>2&quot; (50mm)</td>
<td>9 1/2&quot; (240mm)</td>
<td>9 1/2&quot; (240mm)</td>
</tr>
<tr>
<td>L</td>
<td>7 7/16&quot; (190mm)</td>
<td>7 7/16&quot; (190mm)</td>
<td>7 7/16&quot; (190mm)</td>
</tr>
<tr>
<td>M</td>
<td>15 3/16&quot; (386mm)</td>
<td>3 3/8&quot; (86mm)</td>
<td>3 3/8&quot; (86mm)</td>
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<tr>
<td>N</td>
<td>3 3/8&quot; (86mm)</td>
<td>14&quot; (355mm)</td>
<td>14&quot; (355mm)</td>
</tr>
<tr>
<td>O</td>
<td>2&quot; (50mm)</td>
<td>8&quot; (205mm)</td>
<td>8&quot; (205mm)</td>
</tr>
<tr>
<td>P</td>
<td>5&quot; (127mm)</td>
<td>5&quot; (127mm)</td>
<td>3/8&quot; (9.5mm)</td>
</tr>
</tbody>
</table>
FEATURES

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.

- **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.

- **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.

- **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.

- **Grinding flow chart**
  ![](chart.png)

Additional Features:
- Cycle Interrupt- Table park at left or right for part inspection
- CBN mode for wheel dressing from table (Option)

INSPECTION

- **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"/sec (0.03mm/sec).

- **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).

- **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).

- **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).
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.

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.

ASSEMBLY

Driving Force Test on Column
Driving force test on table
Driving force test on saddle

ASSEMBLY

The column is placed on a granite surface plate and the perpendicularity of the guideways is checked with a precision interference gauge. The possibility of the column guide ways is inspected with a precision interference gauge. Friction and stability 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 guideway system is composed of hardened and ground steel guideways with precision needle roller bearings to provide equal load carrying capacity and to allow the table to be raised without deviation, even during rapid traverse movement.

Saddle Guideway System
The guideway system of the saddle is composed of hardened and ground steel guideways with precision needle roller bearings. The cross powerfeed motor and the cross handwheel are automatically engaged. Crossed roller bearings provide excellent linearity 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.

Crossed Transmission
The saddle incorporates a specially designed pre-compensating feed nut and hardened and ground backlash, 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 0.000050" (0.001mm). Once the worm and wormgear are engaged, the cross powerfeed motor and the cross handwheel are automatically engaged.

MACHINE CONSTRUCTION

FSG-12/16ADII Series
AUTOMATIC PRECISION SURFACE GRINDING MACHINE

MACHINE CONSTRUCTION

FSG-1640ADII
Note:Machine shown with optional accessories

FSG-1632ADII
Note:Machine shown with optional accessories

FSG-1224ADII
Note:Machine shown with optional accessories
ACCESSORIES

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

MACHINE LAMP
- B01-0903 (12, 30V) 12/16 SERIES

GRINDING WHEEL
- B44-0401 Suitable for 14” x 2” x 5” (356mm x 50mm x 127mm) grinding wheel

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

WHEEL FLANGE
- B05-0403 (12/16 SERIES) Suitable for 14” x 2” x 5” (356mm x 50mm x 127mm) 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: 30°
Max. Length: 4” (100mm)

BALANCING STAND
- B13-0601 Suitable for 8” - 14” (203 – 355mm) grinding wheel

STANDARD DRESSING ATTACHMENT
- B13-0406 (12 SERIES)
- B13-0409 (16 SERIES) Suitable for 14” (356mm) grinding wheel

PARALLEL DRESSING ATTACHMENT (HYDRAULIC)
- B13-0401 (12 SERIES)
- B13-0405 (16 SERIES) Suitable for 14” (356mm) grinding wheel

ROTOR DIAMOND DRESSER
- B13-0306 (12 SERIES)
- B13-0307 (16 SERIES) Suitable for 14” (356mm) grinding wheel

ACCESSORIES

DYNAMIC BALANCING SYSTEM
- B44-0401

ROTARY DIAMOND DRESSER
- B13-0401 (12 SERIES)
- B13-0405 (16 SERIES) Suitable for 14” (356mm) grinding wheel

MACHINE LAMP
- B01-0903 (12, 30V) 12/16 SERIES

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

DUST COLLECTOR
- B17-0102 Suction Motor: 1/2HP 2P
Space: 18 1/2” x 19” 11/16”
(470 x 500mm)
Height: 23” (585mm)

COOLANT SYSTEM WITH DOUBLE FILTER
- B17-0901 Volume: 9.5L
Pump: 1/8HP
Coolant Capacity: 20L/min
Space: 26” x 19” (660 x 480mm)
Height: 24” (610mm)

COOLANT SYSTEM WITH AUTO. PAPER FEEDING DEVICE & MAGNETIC SEPARATOR (WITH 1 ROLL OF PAPER)
- B17-0402
Volume: 120L
Paper feeding motor: 25W
Pump: 1/8HP
Coolant Capacity: 20L/min
Space: 21” 1/2” x 9” 3/8” (550 x 1000mm)
Height: 30” 1/2” (775mm)

FREQUENCY CONVERTER FOR SPINDLE
- B48-0042 (12, 16 SERIES)
SMF Voltage: 400V
- B48-0043 (12, 16 SERIES)
SMF Voltage: 200V

OTHER OPTIONAL ACCESSORIES
- 1. Ball screw instead of leadscrew on 4. Double side water baggle (12, 16 SERIES)
- 2. Holes plugs
- 3. Balancing arbor
- 4. Wrench
- 5. Hex. wrench
- 6. Hex. wrench
- 7. Hex. wrench
- 8. Diamond dresser with diamond (B03-0401)
- 9. Splash guard
- 10. Leveling pads
- 11. Levelling screws & nuts
- 12. Hex. wrench
- 13. Fuse
- 14. Hole plugs

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

<table>
<thead>
<tr>
<th>Description</th>
<th>FSG-1224ADII</th>
<th>FSG-1632ADII</th>
<th>FSG-1640ADII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. grinding length</td>
<td>15 3/4&quot;x31 1/2&quot; (400x800mm)</td>
<td>15 3/4&quot;x39 3/8&quot; (400x1000mm)</td>
<td></td>
</tr>
<tr>
<td>Max. grinding width</td>
<td>24&quot;(610mm)</td>
<td>32&quot;(810mm)</td>
<td>40&quot;(1015mm)</td>
</tr>
<tr>
<td>Max. distance from table surface to spindle centerline</td>
<td>12&quot;(305mm)</td>
<td>16&quot;(405mm)</td>
<td></td>
</tr>
<tr>
<td>Longitudinal movement of table</td>
<td>25 5/8&quot;(650mm)</td>
<td>33 7/16&quot;(850mm)</td>
<td>41 1/4&quot;(1050mm)</td>
</tr>
<tr>
<td>Crosswise movement of table</td>
<td>13 3/4&quot;(350mm)</td>
<td>16&quot;(405mm)</td>
<td>18&quot;(460mm)</td>
</tr>
<tr>
<td>Handwheel per revolution</td>
<td>1/8&quot;<del>1 1/4&quot;(3</del>32mm)</td>
<td>0.25&quot;(6mm)</td>
<td>0.0025&quot;(0.1mm)</td>
</tr>
<tr>
<td>Micro Feed per graduation</td>
<td>0.005&quot;(0.1mm)</td>
<td>0.00005&quot;(0.001mm)</td>
<td></td>
</tr>
<tr>
<td>Automatic transverse increment</td>
<td>0.00005&quot;<del>0.002&quot;(0.001</del>0.04mm)</td>
<td>25ipm(500 mm/min)</td>
<td></td>
</tr>
</tbody>
</table>

### Grind Spindle drive

| Speed                        | 60Hz/1750rpm, 50Hz/1450rpm | 5HP/4P |

### Standard grinding wheel

<table>
<thead>
<tr>
<th>Diameter</th>
<th>14&quot;(355mm)</th>
<th>16&quot;x86&quot;x81 7/8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>2&quot;(50mm)</td>
<td>(2950x1490x2080mm)</td>
</tr>
<tr>
<td>Bore</td>
<td>5&quot;(127mm)</td>
<td>(3340x1730x2080mm)</td>
</tr>
</tbody>
</table>

### Hydraulic system

<table>
<thead>
<tr>
<th>Power rating</th>
<th>1HP/6P</th>
<th>2HP/6P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevating drive</td>
<td>1/6&quot;HP/4P</td>
<td>AC servo 1kw</td>
</tr>
<tr>
<td>Power rating</td>
<td>1/6&quot;HP/4P</td>
<td>AC servo 1kw</td>
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</table>

### Floor Space

<table>
<thead>
<tr>
<th>Total space required</th>
<th>116&quot;x59&quot;x81 7/8&quot; (2950x1490x2080mm)</th>
<th>139 3/8&quot;x68&quot;x81 7/8&quot; (3340x1730x2080mm)</th>
<th>168 1/2&quot;x86&quot;x81 7/8&quot; (4280x1730x2080mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net weight approx.</td>
<td>4849 lbs(2200kgs)</td>
<td>6394 lbs(2900kgs)</td>
<td>7710 lbs(3500kgs)</td>
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<tr>
<td>Gross weight approx.</td>
<td>5951 lbs(2700kgs)</td>
<td>7862 lbs(3550kgs)</td>
<td>9240 lbs(4200kgs)</td>
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<tr>
<td>Rated power, approx.</td>
<td>5.6kw(7.5HP)</td>
<td>6.3kw(8.5HP)</td>
<td></td>
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</tbody>
</table>

### 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

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

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

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FSG-1224ADII</th>
<th>FSG-1632ADII</th>
<th>FSG-1640ADII</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A (lbs)</strong></td>
<td>690(314)</td>
<td>946(403)</td>
<td>930(423)</td>
</tr>
<tr>
<td><strong>B (lbs)</strong></td>
<td>230(106)</td>
<td>433(197)</td>
<td>543(247)</td>
</tr>
<tr>
<td><strong>C (lbs)</strong></td>
<td>924(420)</td>
<td>1320(600)</td>
<td>1474(670)</td>
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</tbody>
</table>

Grinding with Magnetic Chuck

Grinding without Magnetic Chuck