CHEVALIER®

Grinding / Turning / Milling





FSG-20 • 24ADIV Series

Column Type High Precision 3-Axes Automatic Surface Grinder

FSG-2040ADIV • 2060ADIV
FSG-2440ADIV • 2460ADIV • 2480ADIV
FSG-24120ADIV

FSG-20 • 24ADIV Series

Column Type High Precision 3-Axis Automatic Surface Grinder

Variable Speed Spindle

The built-in spindle driver can control the spindle speed. With the automatic dressing function, the driver will provide a constant surface speed according to the wheel's diameter.

In-Machine Dynamic Balancing

Adjust balance weight at the position.
In-Machine dynamic balance system can limit wheel vibrations to less than 1 μm

Load Force Detection

The spindle load can be measured during machining cycle. The operator can utilize this information to determine whether a wheel needs to be dressed from his or her own discretion. If an abnormal load is detected, the spindle will automatically move up to stop the cycle.

Automatic Dressing on Table

During a machining cycle, the machine can enter an automatic dress cycle. The table will position itself where the diamond is set and will dress and compensate according to operator's settings.

Precision Spindle and Rigid Elevating Guideways

The rigid wheelhead houses a large diameter cartridge type spindle supported by six super precision Class 7 (P4) permanently lubricated angular contact ball bearings. The balanced spindle motors are air cooled to ensure optimum surface finishes and maintain superior accuracy.

Optional Automatic Wheel Dressing with Compensation

The machine efficiency is maximized by the automatic dressing with automatic dressing compensation during rough and/or fine grinding and at the end of rough grinding. This allows the machine to run unattended and reduces machining costs.

Completely Supported Guideways

Extended base guideways for crossfeed and longitudinal travel enhance the machines rigidity and stability in addition to upgrading the machines accuracy and longevity. The permissible loads can be completely supported and table overhang is eliminated.

Rigid Construction

All essential casting is made of high grade dense cast iron which has been stress relieved and ribbed with honeycomb ribs to enhance rigidity and increase stability, which increases cutting capability.

Crossfeed Stroke Setting

The crossfeed travel is set with push buttons on the control panel. This new break through in design is more efficient and user-friendly.

Wheelhead Driven by AC Servo Motor

An AC servo motor provides high torque, high-speed and accurate positioning with a minimum increment of 0.001 mm (0.0001"). A manual pulse generator (MPG) is standard for easy operation.

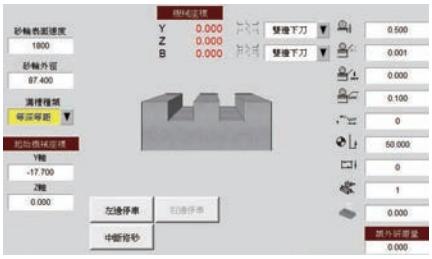
Crossfeed Speed Control

The crossfeed is combined with a servo motor and is controlled by a ratio switch to obtain a better grinding surface finish and better dressing result.

FSG-20 • 24ADIV Series
Control

The Control Features

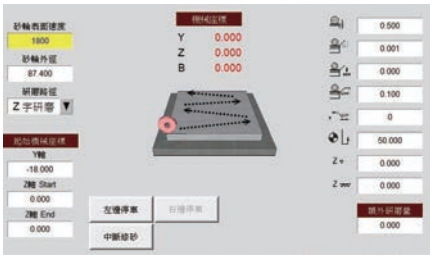
1. High reliability NC control platform.
2. 10.4" TFT high resolution 65,536 pixel color touch panel control interface.
3. Powerful graphic conversational function with surface/plunge standard built-in grinding program.
4. Brief and clear operation panel.
5. Machine abnormal alarm message display and alarm history record.
6. Y and Z axes home positioning function.
7. Mechanical coordinates and relative coordinates display.
8. Digital I/O check mode makes service system more efficient.
9. Operation friendly, grinding, wheel dressing and automatic compensation can be accomplished easily without making CNC program.
10. iMachine Communications Systems™ is ready for remote data collection and data tracking from mobile device (Additional PC and softwares are needed).



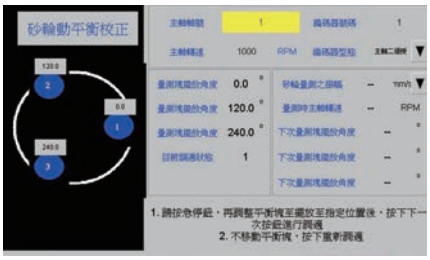
Plunge Grinding Mode



Surface Grinding Mode



Crisscross Grinding Mode



In-Machine Dynamic Balancing



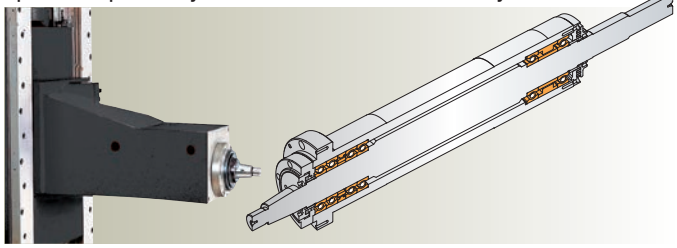
Automatic Overhead Dresser with Compensation (optional)



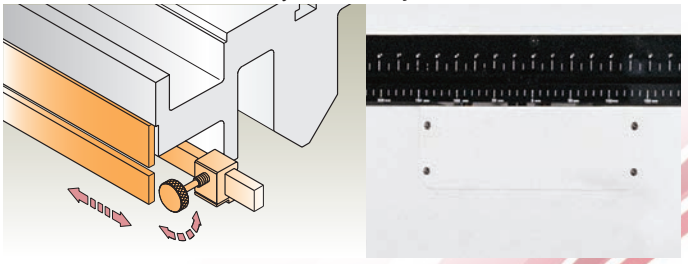
Automatic Dressing on Table (optional)

FSG-20ADIV Series
Machine Construction

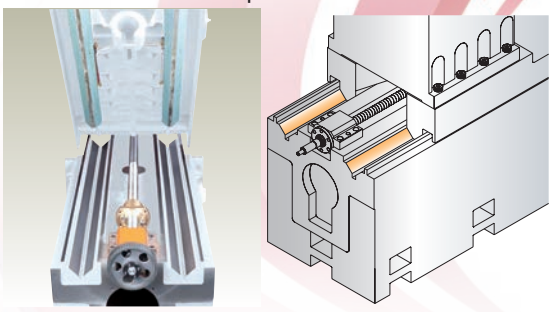
Spindle
The spindle is supported by six pieces of Class 7 (P4) super precision angular contact ball bearings, which have been accurately measured, selected and preloaded and assembled in a temperature controlled clean room. The spindle is permanently lubricated and requires no maintenance. The large diameter spindle is precisely balanced to ensure accuracy.



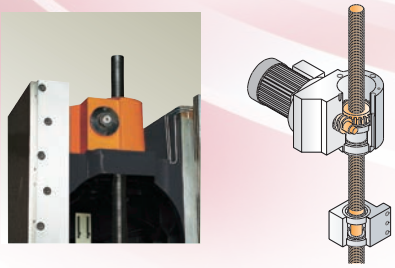
Longitudinal Stroke Adjustment Device
Table reversal is controlled by proximity switches which never make contact. It is simple for operator to adjust table reversal to minimum required stroke, thereby grinding less air and reducing grinding time. Stroke adjustment protection plate is designed to allow table stroke to be adjusted safely.



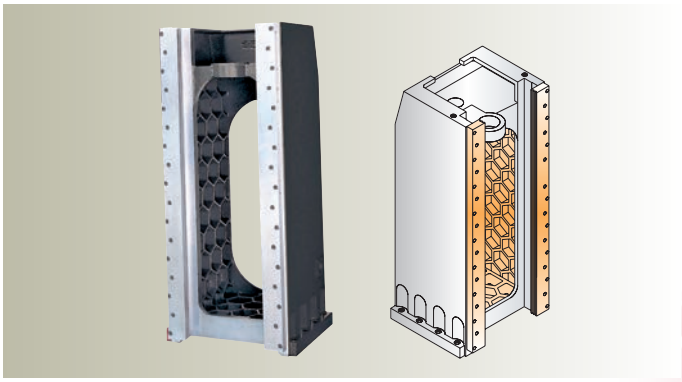
Crossfeed Guideways
Double "V" guideways are ground and laminated with Turcite-B then precisely hand scraped. Continuous lubrication is provided to ensure smooth and precise crossfeed increments.



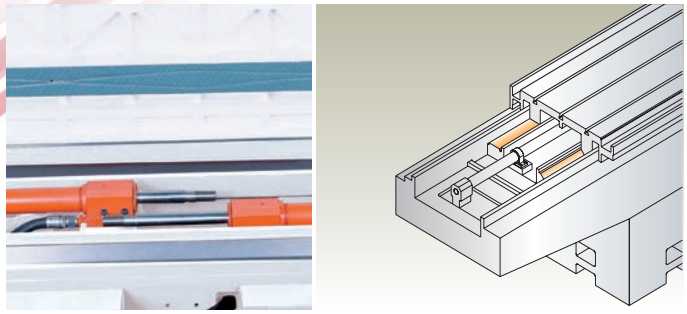
Elevating Transmission Mechanism
The wheelhead travelling on a preloaded hardened and ground guideway system is driven by a hardened and ground leadscrew and an AC servo motor providing high torque, speed and accurate positioning with minimum increment of 0.001 mm (0.0001"). A manual pulse generator (MPG) is standard for easy operation.



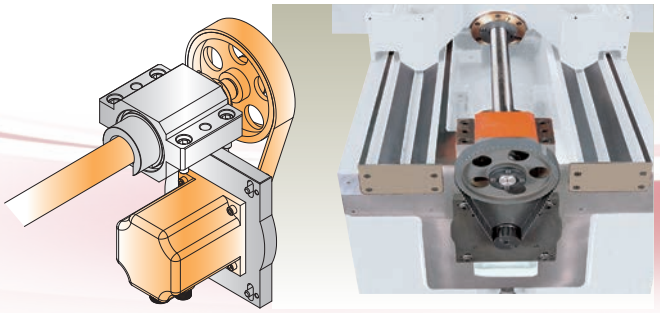
Column
The column is made of high grade dense cast iron which has been stress relieved and ribbed with honeycomb type ribs to enhance rigidity and increase stability thereby increasing the grinding performance.



Longitudinal Slide Way
One "V" and one flat table guideways are laminated with Turcite-B and precisely hand scraped to ensure high accuracy. Continuous lubrication is provided to assure smooth stick-slip free movement of the table and accurate positioning.



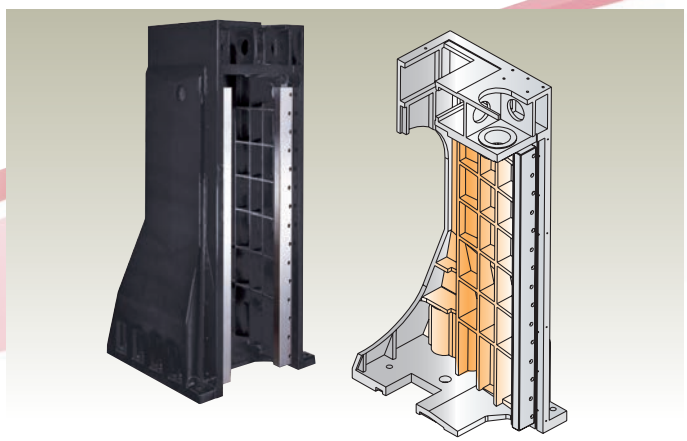
Crossfeed Transmission Mechanism
Enlarged precision leadscrew with backlash adjustment device is driven by an AC motor. The encoder type stroke setting key allows crossfeed reversal points to be set from operator's control panel, thereby working efficiency is increased.



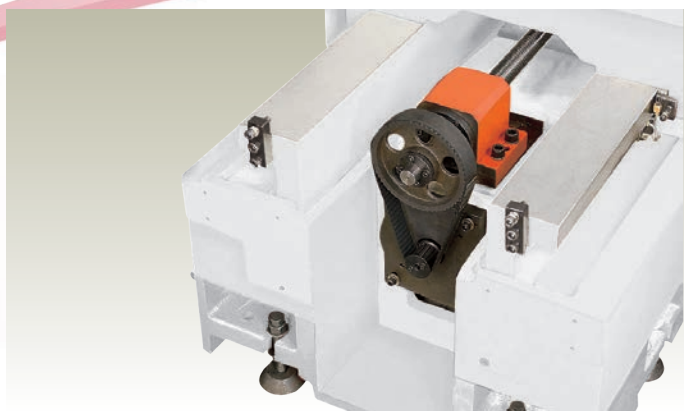
FSG-24ADIV Series
Machine Construction

Stable Structure
The column is made of high-grade dense cast iron that has been stress relieved. With ribbed and computer analyzed structure, the stability and rigidity is greatly increased.

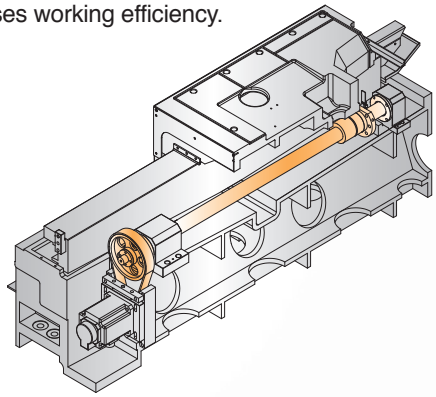
Spindle travels on hardened and ground square ways, and is driven by precision ballscrew and an AC servomotor for heavy grinding and smooth and accurate movement.



Crossfeed Slideway
Hardened and ground guideways are laminated with Turcite-B, then precisely hand scrapped. Continuous lubrication is provided to assure smooth stick-slip free movement of the table and accurate positioning.

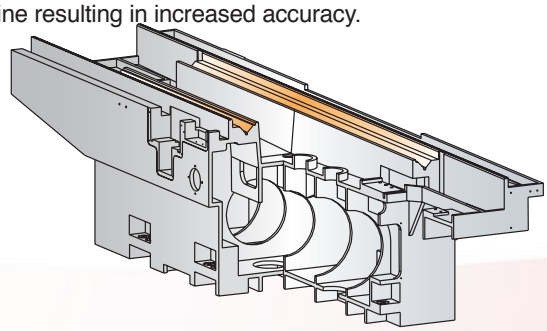


Crossfeed Transmission Mechanism
An AC servo motor and the ballscrew drives the column in a linear motion. The encoder type stroke setting key allows the crossfeed reversal points to be set from operator's control panel that increases working efficiency.



Longitudinal Slideways
With double "V" guideways, which are laminated with Turcite-B anti-friction material, for smooth and stable longitudinal movement.

The table is full supported on the well-designed front base of machine resulting in increased accuracy.

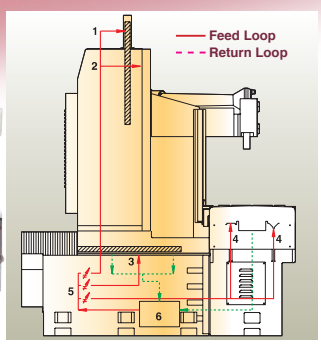


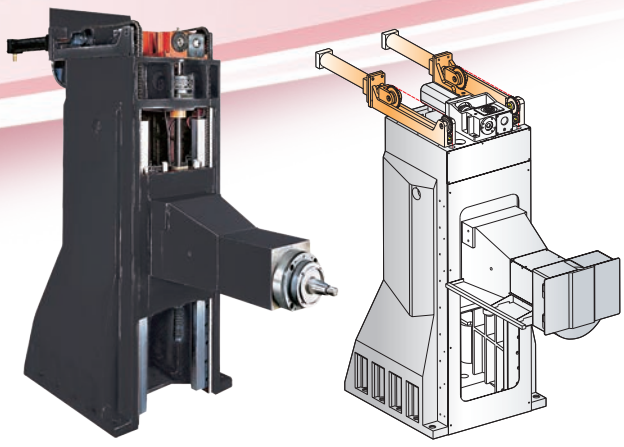
Spindle Counter Weights Balance System
Pneumatic counter weights balance system is installed to eliminate backlash and wear of elevating screws.

Automatic Lubrication System (FSG-20 • 24 ADIV Series)
The series is quipped with a central continuous lubrication system. A warning light will illuminate if the oil pressure drops below preset pressure.

1. Elevating leadscrew
2. Column guideways
3. Cross guideways
4. Table guideways
5. Flow divider
6. Lubricator







Elevating Transmission Mechanism

FSG-20 • 24ADIV Series

Optional Accessories

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



Machine lamp



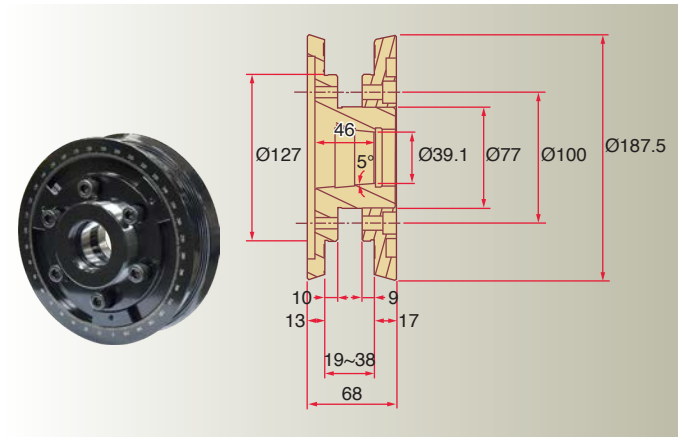
• **Diamond dresser**

1.0 Carat



Water baffle

for 20ADIV series



• **Wheel flange** (Bore size: Ø127mm)

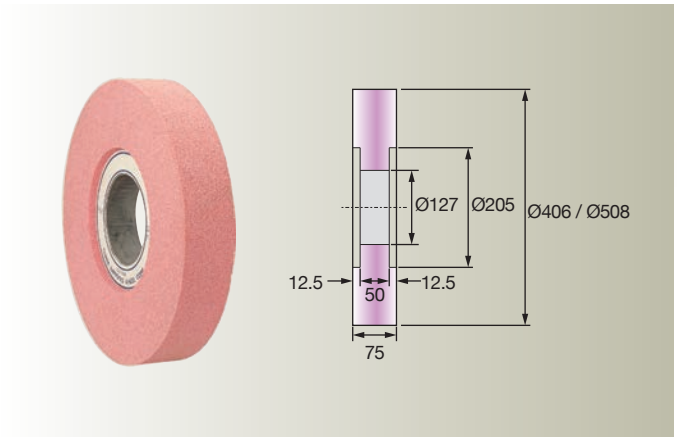
for 20ADIV series

Clamping width: 19~38 mm (3/4" ~ 1 1/2")

for 24ADIV series

Clamping width: 32~50mm (1 1/4" ~ 2")

Clamping width: 43~50mm (1.7" ~ 2")



• **Grinding wheel**

for 20ADIV series

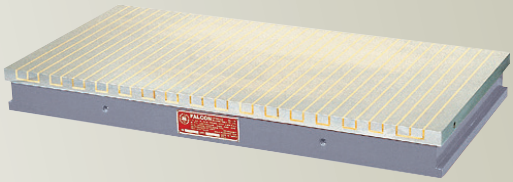
Ø355 x 50 x Ø127 mm

for 24ADIV series

Ø406 x 75 x Ø127mm (Ø16" x 3" x Ø5") Double recessed

Ø508 x 75 x Ø127mm (Ø20" x 3" x Ø5") Double recessed





* To order chuck control is required.

• **Chuck control**

Input Voltage: 135VAC Output Voltage:110VDC 10A, with variable holding power, auto demagnetization

* Must be ordered with electro magnetic chuck.

• **Electromagnetic chuck**

for 20ADIV series

500x1,000mm (19 5/8" x 39 3/8")

500x1,500mm (19 5/8" x 59")

(Voltage: 110V DC)

for 24ADIV series

600x1,000mm (24" x 39 3/8"), 1pc

600x1,500mm (24" x 59"), 1pc

(Voltage: 110VDC)

600x1,000mm (24" x 39 3/8"), 2pcs

600x1,500mm(24" x 59"), 2pcs

FSG-20 • 24ADIV Series

Optional Accessories



- **Spindle motor**

  for 20ADIV series

  15 HP / 6 P for 508 mm (Ø20") grinding wheel

  for 24ADIV series

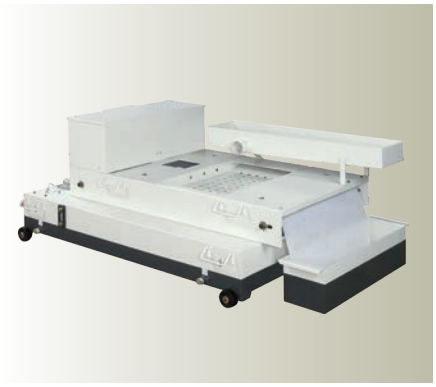
  25 HP / 4 P
  15 HP / 6 P for Ø508 mm (Ø20") grinding wheel
  25 HP / 6 P for Ø508 mm (Ø20") grinding wheel



- **Hydraulic temperature regulator**

  for 20ADIV series

  Volume: 20 L
  Cooling capacity: 3,750 kcal/hr, 50 Hz
  4,500 kcal/hr, 60 Hz

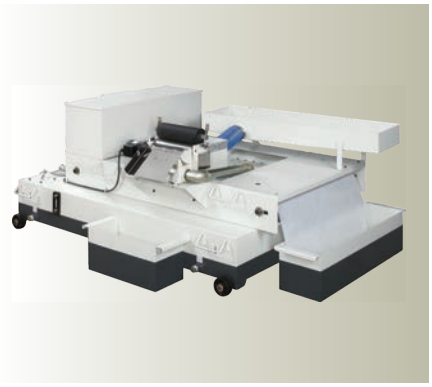


- **Coolant system with auto paper feeding device**

  (with 1 roll of paper)

  for 20ADIV series

  Volume: 120 L
  Paper Feeding Motor: 25 W
  Pump: 1/4 HP
  Coolant Capacity: 20 L/min
  Space: 1,450 x 620 mm (57" x 24.4")
  Height: 760 mm (30")



- **Coolant system with auto paper feeding device and magnetic separator**

  (with 1 roll of paper)

  for 20ADIV series

  Volume: 120 L
  Paper Feeding Motor: 25 W
  Pump: 1/4 HP
  Coolant Capacity: 20 L/min
  Space: 1,450 x 620 mm (57" x 24.4")
  Height: 760 mm (30")

  Volume: 250 L
  Pump: 1/2 HP
  Coolant Capacity: 120 L/min
  Space: 1,600 x 1,100 mm (63" x 43")
  Height: 750 mm (29.5")

FSG-20 • 24ADIV Series

Optional Accessories

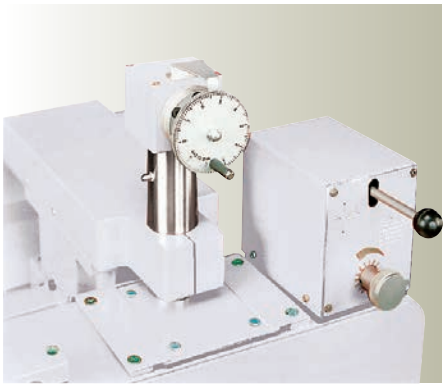
Note: Items marked with • are recommended to be factory installed.



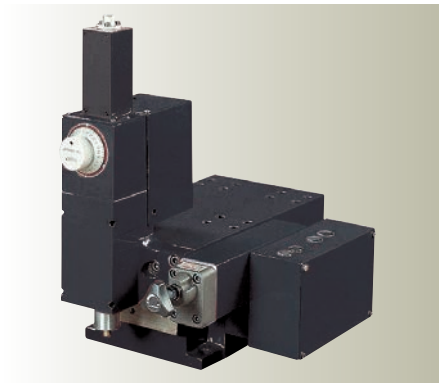
• **Overwheel parallel dresser with automatic dress compensation**
for 20ADIV series
Max. OD: 355 mm (14")
Mini OD: 235 mm (9.3")
Max. length: 60 mm (2.4")



• **Balancing Stand with Levelling Bubble**
for 20ADIV series
Max. Dia: 355 mm (14")
Max. width: 50 mm (2")



• **Parallel Dressing Attachment** (Hydraulic Type)
for 20ADIV series
Max. OD: 355 mm (14")
Mini OD: 235 mm (9.3")
Max. length: 60 mm (2.4")



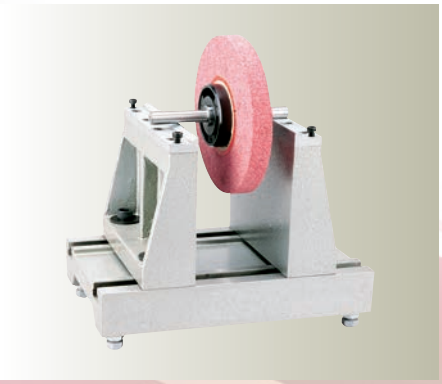
• **Auto over-the-wheel dresser with auto dressing compensation**
for 24ADIV series
Suitable for 406 mm (16")
grinding wheel max. OD: 406 mm (16")
Mini OD: 236 mm (9.3")
Max. length: 76 mm (3")



• **Roller Balancing Stand** (I)
for 20ADIV series
Max. Dia: 355 mm (14")



• **Roller Balancing Stand** (II)
for 24ADIV series
Max. Dia: 508 mm (20")



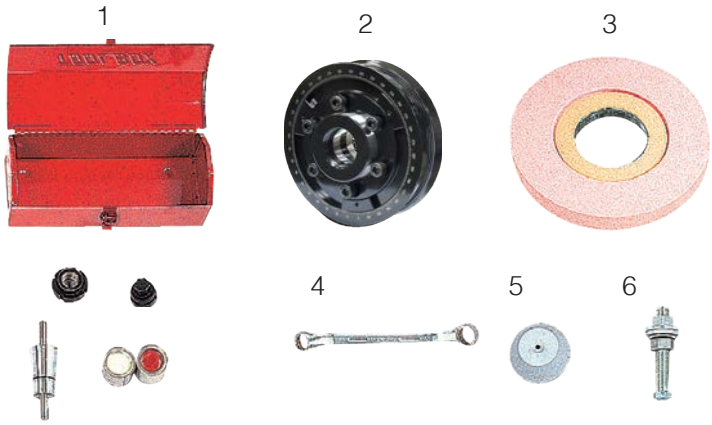
Guildway Type Balancing Stand
for 24ADIV series



• **Spindle Temperature Regulator**
Volume:7L
Cooling capacity:1,000 kcal/hr, 60 Hz
840 kcal/hr, 50 Hz

FSG-20 • 24ADIV Series

Standard Accessories



1. **Tool box**
   (include locking nut, wheel flange extractor, balancing arbor, touch-up paint)
2. **Wheel flange**
3. **Grinding wheel**
4. **Wrench**
5. **Levelling pads**
6. **Levelling screws and nuts**



Water baffle
for 24ADIV Series

Splash guard



- **Hydraulic temperature regulator**
  for 24ADIV Series

  Volum: 35 L
  Cooling capacity: 5,000 kcal/hr, 50 Hz
  6,000 kcal/hr, 60 Hz

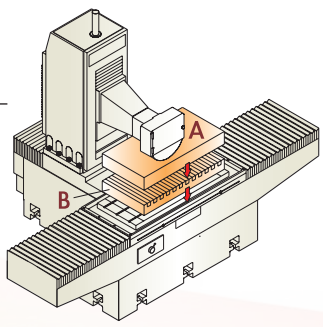
Permissible Load of Machine

The total suggested maximum loads of working table are shown as follows

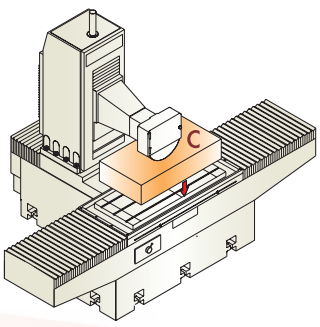
A = Workpiece **B** = Magnetic chuck **C** = **A** + **B**

Unit: kg (lb)

Item	2040ADIV	2060ADIV	2440ADIV	2460ADIV	2480ADIV	24120ADIV
A	900 (1,980)	1,100 (2,420)	1,120 (2,464)	1,320 (2,904)	1,240 (2,728)	1,540 (3,388)
B	270 (594)	440 (968)	380 (836)	480 (1,056)	760 (1,672)	960 (2,112)
C	1,170 (2,574)	1,540 (3,388)	1,500 (3,300)	1,800 (3,960)	2,000 (4,400)	2,500 (5,500)



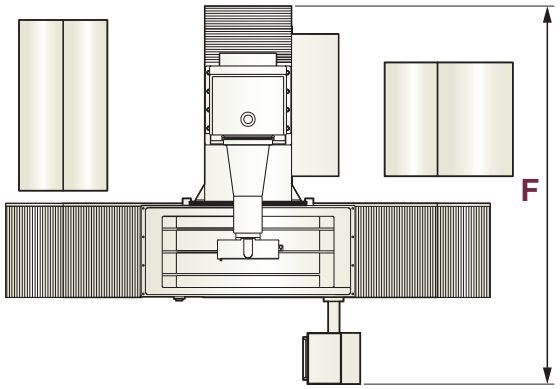
Grinding with Electromagnetic Chuck

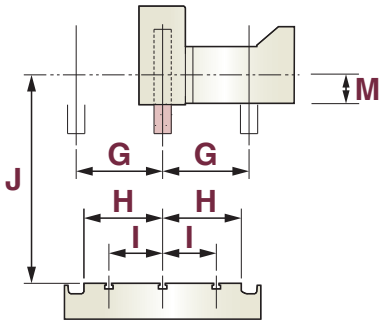


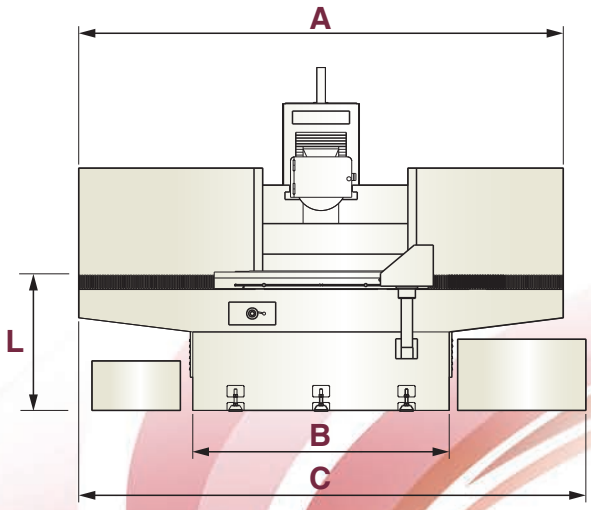
Grinding without Electromagnetic Chuck

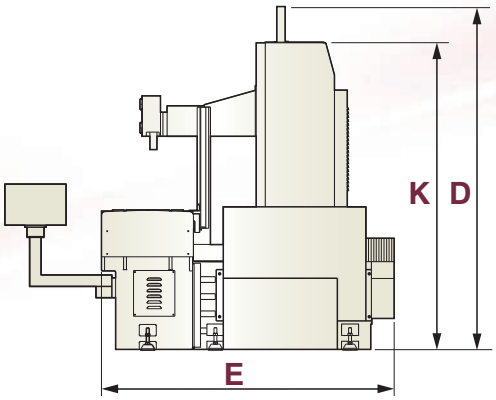
FSG-20 • 24ADIV Series

Dimensional Drawings









Unit: mm (")

Item	2040ADIV	2060ADIV	2440ADIV	2460ADIV	2480ADIV	24120ADIV
A	3,400 (133.8)	4,600 (181.1)	3,500 (137.8)	4,500 (177.2)	6,000 (236.2)	8,733 (344.8)
B	1,800 (70.8)	2,800 (110.2)	2,100 (82.6)	3,100 (122)	4,100 (161.4)	8,000 (315)
C	3,810 (150)	4,953 (195)	3,870 (152.3)	4,870 (191.7)	6,120 (241)	8,000 (315)
D	2,719 (107)		-			
E	2,175 (85.6)		2,750 (108.3)			
F	2,810 (110.6)		3,660 (144.1)			
G	280 (11)		295 (11.6)			
H	280 (11)		305 (12)			
I	160 (6.3)		210 (8.3)			
J	730 (28.7)		Max. 850 (33.5), Min. 170 (6.7)			
K	2,310 (91)		2,799 (110)			
L	990 (39)		880 (34.6)			
M	95 (3.7)		110 (4.3)			

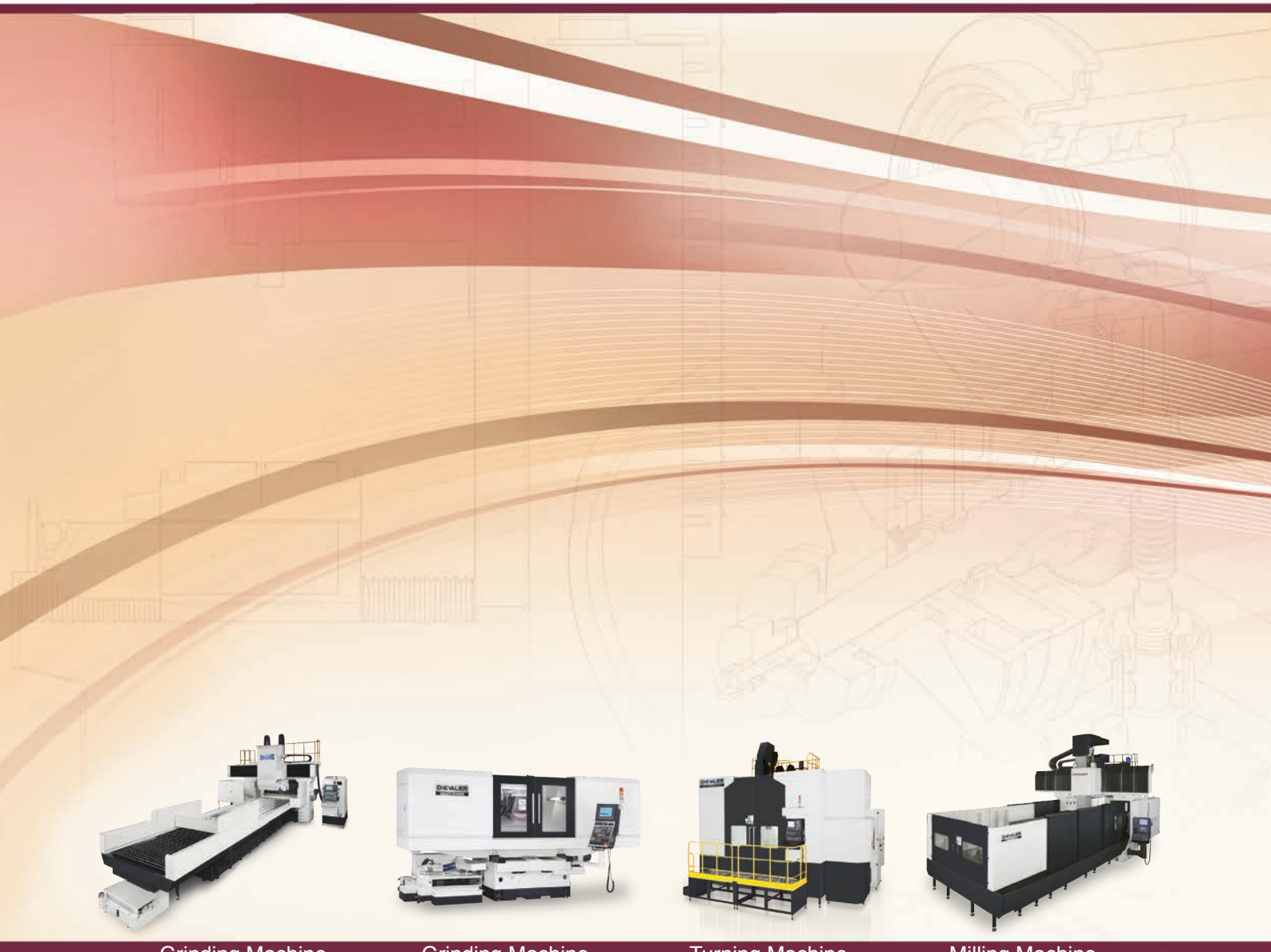
FSG-20 • 24ADIV Series

Specifications

Item	Description	2040ADIV	2060ADIV	2440ADIV	2460ADIV	2480ADIV	24120ADIV
Capacity	Max. Grinding Length	1,000 mm (40")	1,500 mm (59")	1,000 mm (40")	1,500 mm (50")	2,000 mm (78.7")	3,000 mm (118")
	Max. Grinding Width	500 mm (20")		600 mm (23.6")			
	Max. Distance from Table Surface to Spindle Center	730 mm (28.7")		850 mm (33.4")			
Table	Table Size	500 x 1,000 mm (20" x 40")	500 x 1,500 mm (20" x 59")	600 x 1,000 mm (24" x 40")	600 x 1,500 mm (24" x 59")	600 x 2,000 mm (24" x 80")	600 x 3,000 mm (24" x 118")
	T Slot (size x Dis./ No.)	14 mm x 160 mm (0.55" x 6.3") / 3 pc		14 mm x 210 mm (0.55" x 8.3") / 3 pc			
	Distance Between Table and Ground	990 mm (39")		880 mm (34.6")			
	Table Speed	5~25 m/min (16~82 fpm)					
	Max. Travel	1,100 mm (43.3")	1,600 mm (63")	1,100 mm (43.3")	1,600 mm (63")	2,100 mm (82.6")	3100 mm (122")
Transverse Movement (Z)	Rapid Travel	0~2250 mm/min (0~99 ipm)					
	Automatic Transverse Movement	1~32 mm					
	Least Increment Input	0.001 mm (0.0001")					
	Max. Travel	560 mm (22")		675 mm (26.6")			
				Optional 670 mm (26.4") (with double side water baffle)			
Elevating Movement of WheelHead (Y)	Rapid Travel	396 mm/min		675 mm/min			
	Least Increment Input	0.001 mm (0.0001")					
Spindle	Spindle Speed	1,800 rpm					
	Grinding Wheel (OD x Width x Bore)	Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5")		Ø406 x 75 x Ø127 mm (Ø16" x 3" x Ø5")			
	Spindle Motor	7.5 kW (10 HP, 4 P)		11 kW (15 HP)			
Power Requirement		18 kVA	20 kVA	24 kVA	26 kVA		
Tank Capacities	Hydraulic Tank	200 L (52 gal)		250 L (66 gal)			
	Lubricant Tank	20 L (5 gal)					45 L (12 gal)
Machine Dimension	Floor Space (W x D x H)	3,810 x 2,997 x 2,719 mm (150" x 118" x 107")	4,953 x 2,997 x 2,719 mm (195" x 118" x 107")	3,870 x 3,660 x 2,799 mm (152' x 144" x 110")	4,870 x 3,660 x 2,799 mm (191' x 144" x 110")	6,120 x 3,660 x 2,799 mm (240' x 144" x 110")	8,733 x 3,660 x 2,799 mm (343' x 144" x 110")
	Weight	6,200 kg	7,900 kg	8,400 kg	9,800 kg	10,600 kg	17,500 kg

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