



# FSG-20/24 ADIV Series

Column Type, 3-axis, Fully Automatic  
Precision Surface Grinder

In-machine dynamic balancing

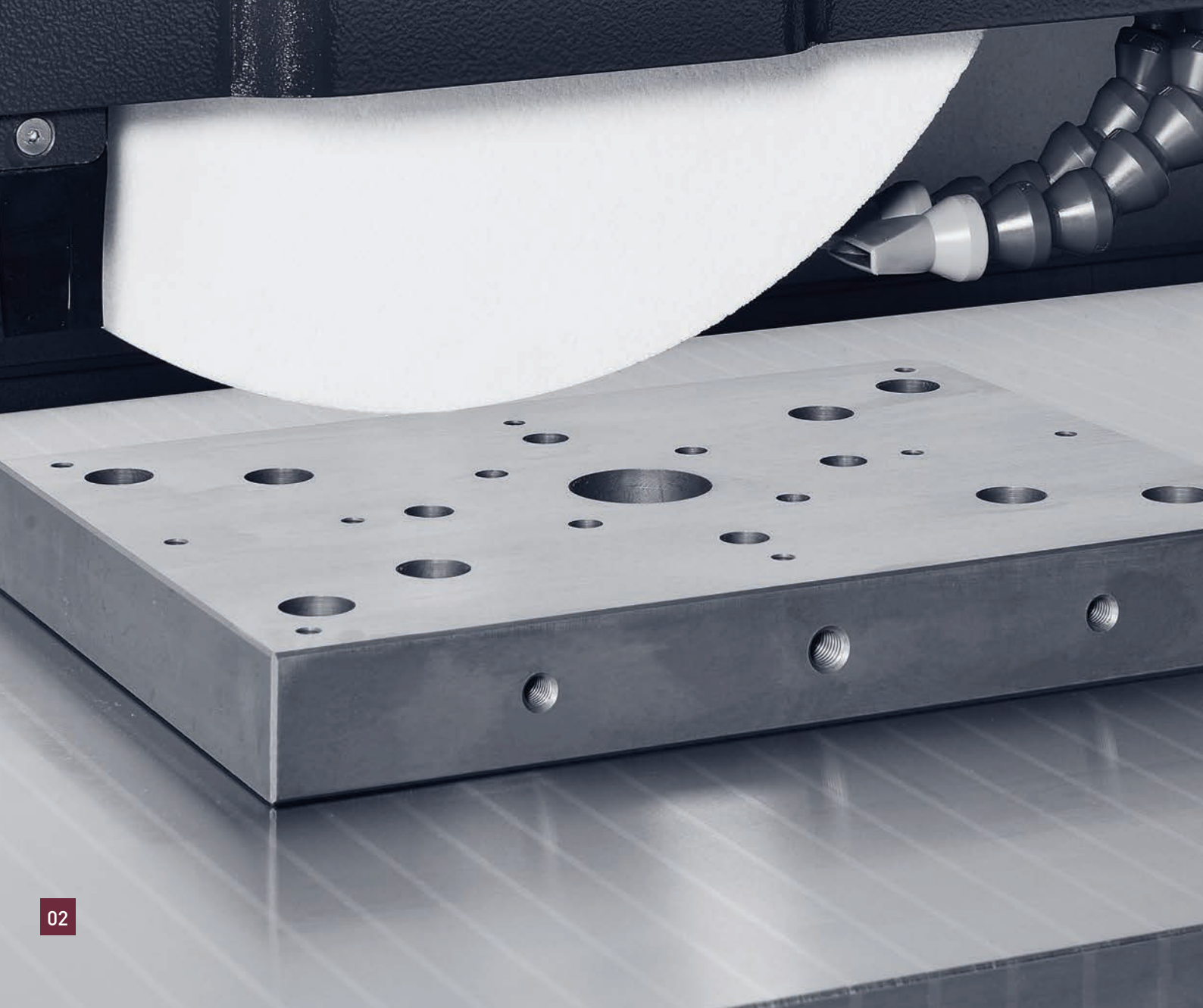


**CHEVALIER**<sup>®</sup>

Grinding / Turning / Milling

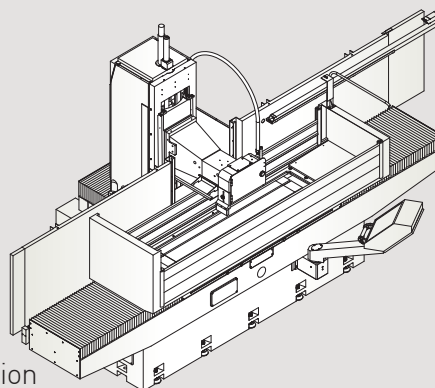
We shape your ideas.<sup>™</sup>

Crossfeed speed is controlled by AC servo motor for finer surface finish and finer accuracy



## Introduction

Chevalier's FSG-ADIV Series of surface grinders has several design features to shorten your processing and non-processing preparation while delivering high-precision workpieces year after year—functions you might not expect on such affordable machines: iSurface control, variable speed spindle, constant surface speed, loading detection and in-machine manual dynamic balancing.



The control provides a grind cycle that has rough grinding, fine grinding, spark-out passes and an automatic over-head wheel dresser with compensation that can be added to fully automate the grind process.

This series of grinders also features tools to secure Big Data with Chevalier's exclusive iMachine Communications System™ (iMCS). This software package, combined with data analysis, enhances machine efficiency in the factory while enabling remote monitoring and diagnostics to track machine performance and identify potential problems before they begin.

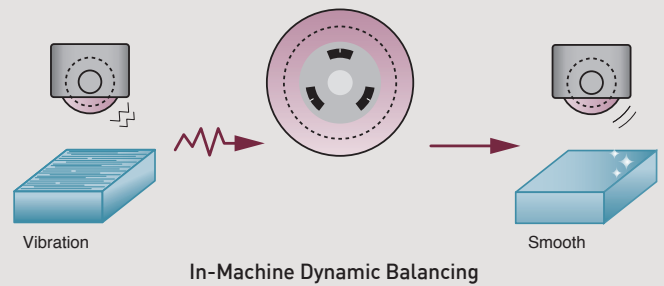


The FSG-2060ADIV is shown with optional accessories.

# Key Features and Benefits

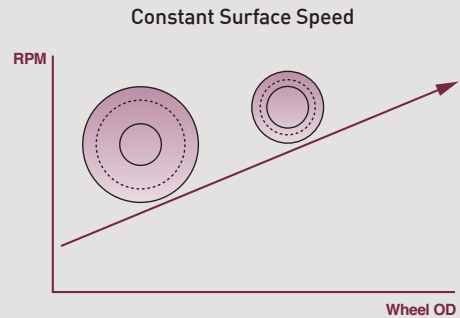
## In-machine dynamic balancing

By manually adjusting the in-machine dynamic balancing function, operators can reduce grinding wheel vibration and eliminate the surface workpiece ripple to improve grinding quality.



## Variable speed spindle

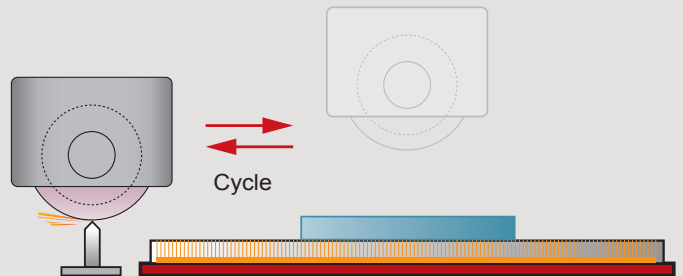
The built-in driver controls spindle speed. Combined with the automatic dressing function, the driver provides constant surface speed regardless of the grinding wheel's changing diameter.



A higher level of precision, flexibility and functionality with in-machine manual dynamic balancing

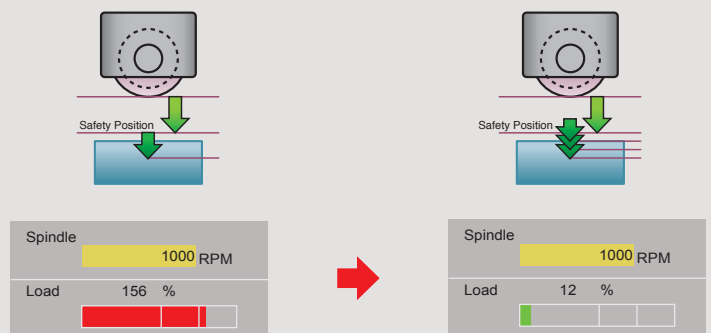
## Automatic dressing on table (optional)\*

When the grinder enters an automatic dress cycle, the table automatically positions itself where the diamond is set to dress and compensate according to operator settings.



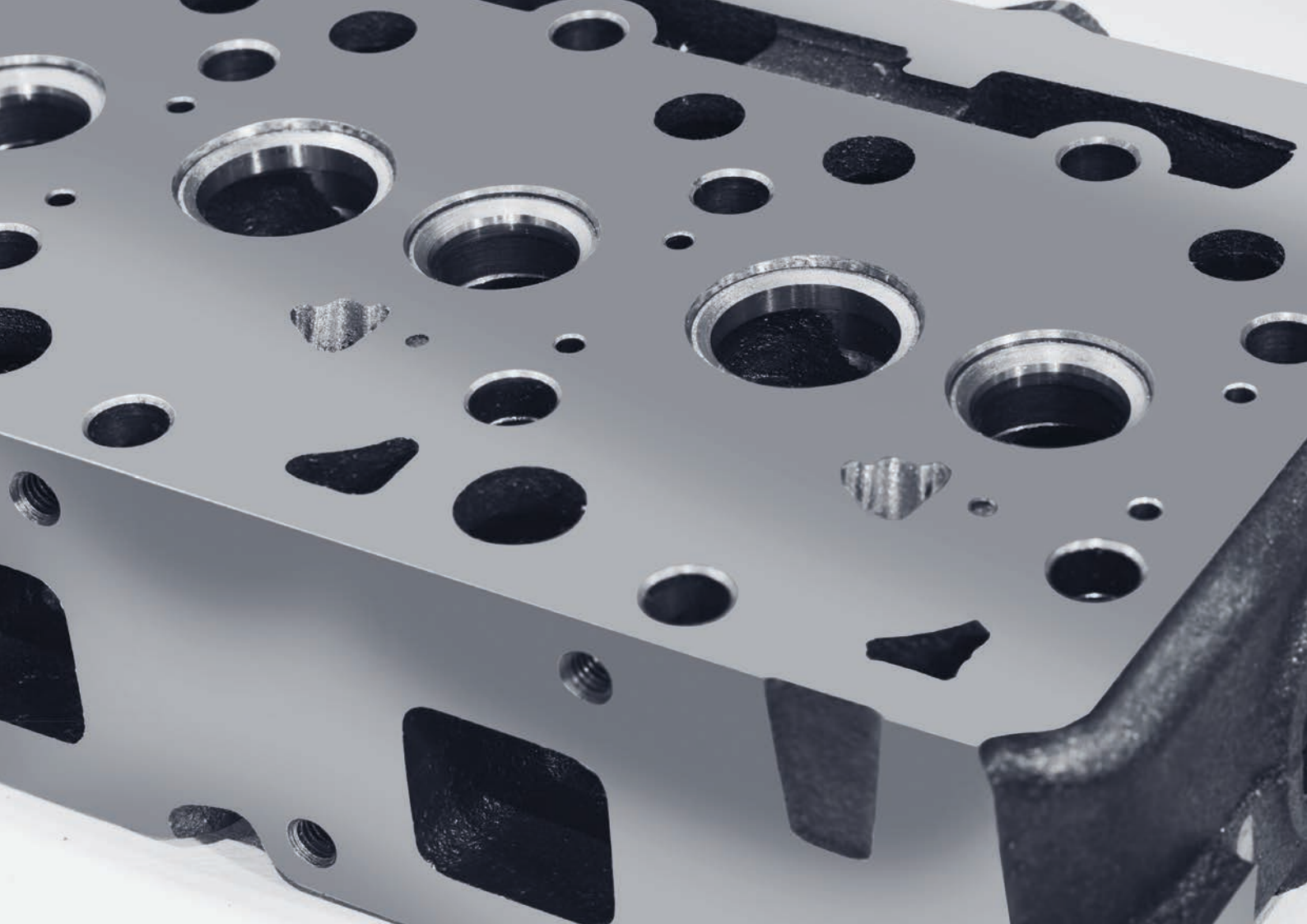
## Load force detection

Operator can measure the spindle load during the machining cycle, then utilize this data to determine at his or her own discretion whether the wheel requires dressing. If an abnormal load is detected, the spindle automatically moves up to stop the cycle.



## Enhanced control system

Unlike PLC control boards, the PC-based control's powerful computing power enhances the HMI for more precise control. Combined with data analysis from network connectivity, it permits managers to improve production presses for higher output.



## iMachine Communications System™ (iMCS) software

This exclusive Chevalier software package remotely collects data and allows managers to track it from any mobile device. (Additional PC and software are required.)



# Control Features and Benefits

## All new iSurface control

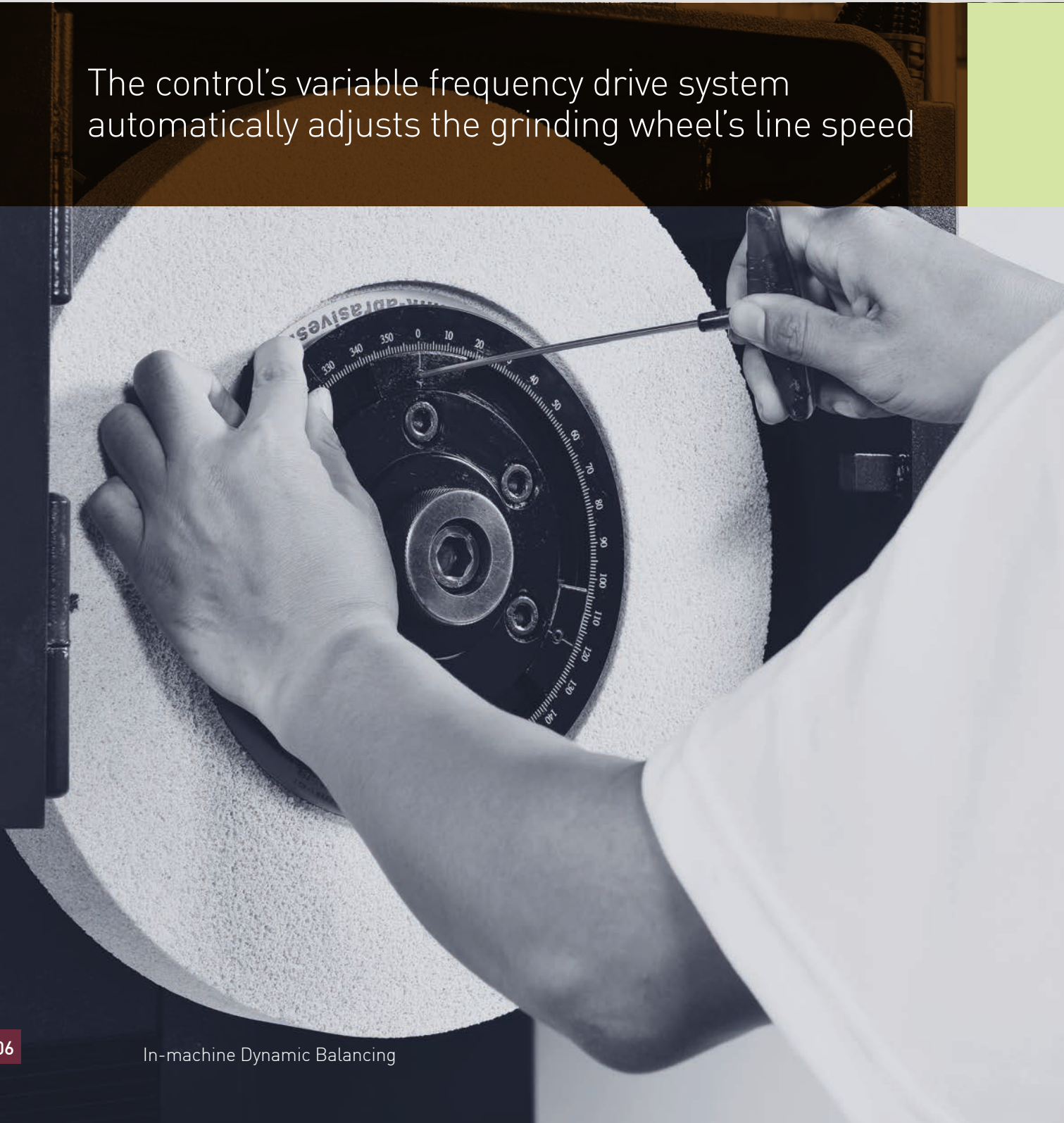
FSG-ADIV Series controls are PC-based (NC control), high specification industrial units. The high-response AC servo motors on the Y and Z axes are designed to improve accuracy.

The control is equipped with a variable frequency drive system that automatically adjusts the grinding wheel's line speed. A magnetic encoder

accurately detects spindle load and correctly grasps the spindle cutting load.

A built-in acceleration gauge monitors the grinding wheel's balance at all times. If the wheel becomes unbalanced the operator will be notified to rebalance the wheel.

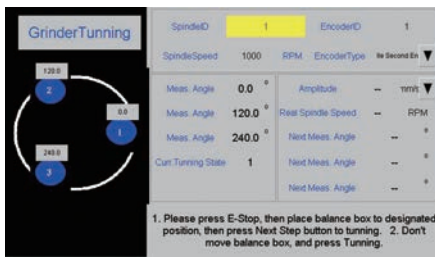
The control's variable frequency drive system automatically adjusts the grinding wheel's line speed



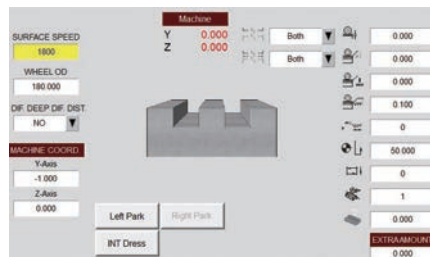


## Perfect HMI control

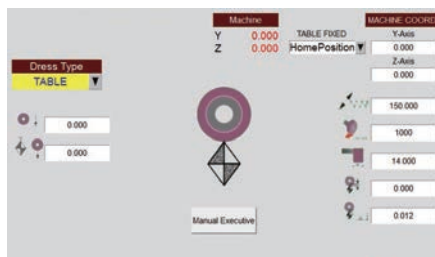
The control's standard equipment includes a 10.4" high-color touchscreen with HMI.



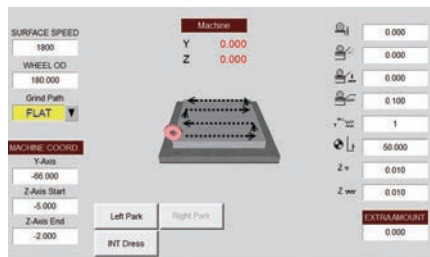
In-Machine Dynamic Balancing



Plunge Grinding Mode



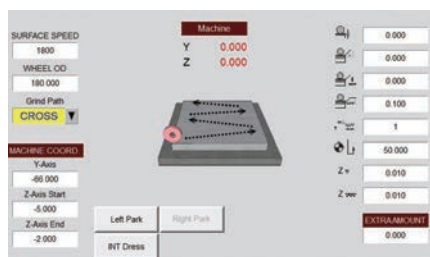
Automatic Dressing on Table (optional)\*



Surface Grinding Mode



Automatic Overhead Dresser with Compensation (optional)



Crisscross Grinding Mode

\*U.S.A.: standard

## Wheel Dressing

A normal dressing mode wastes time by cutting in air. The iSurface dressing mode never cuts air because the diamond is in constant contact with the wheel to minimize dress time.

### Auto dressing modes (optional)\*

Conversational graphic automatic wheel dressing modes can be linked with any—or all—grinding modes.




\*U.S.A. Auto dressing is standard

The FSG-2460ADIV is shown with optional accessories.

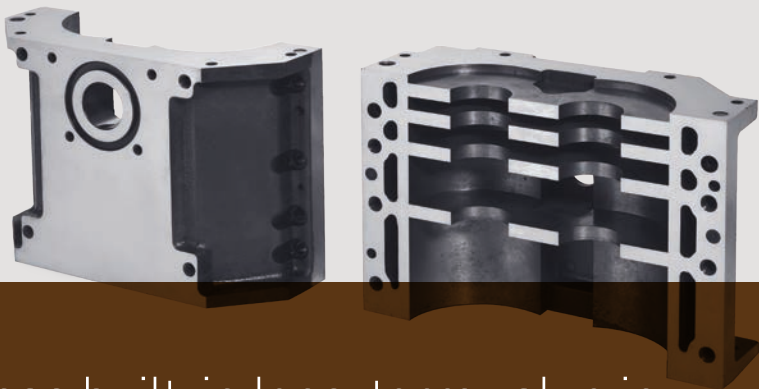
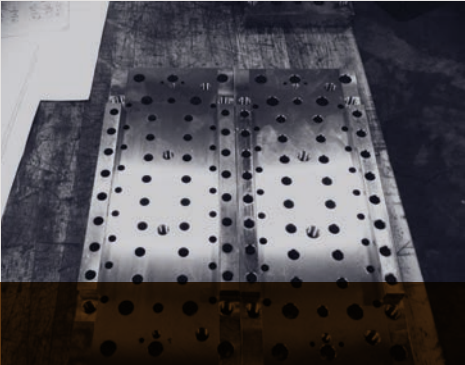
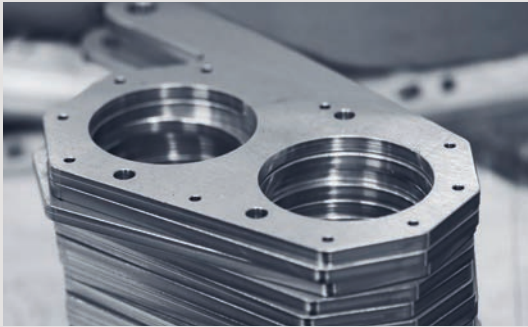
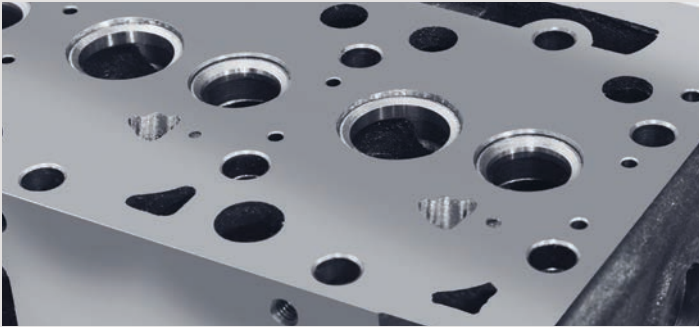
### On Table Dressing



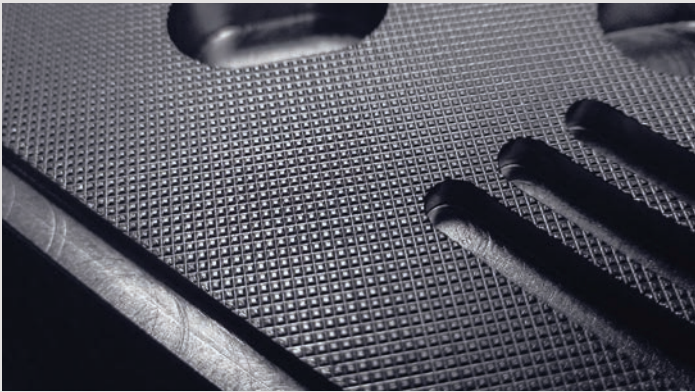
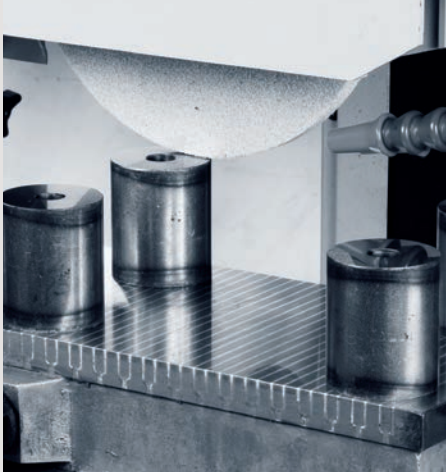
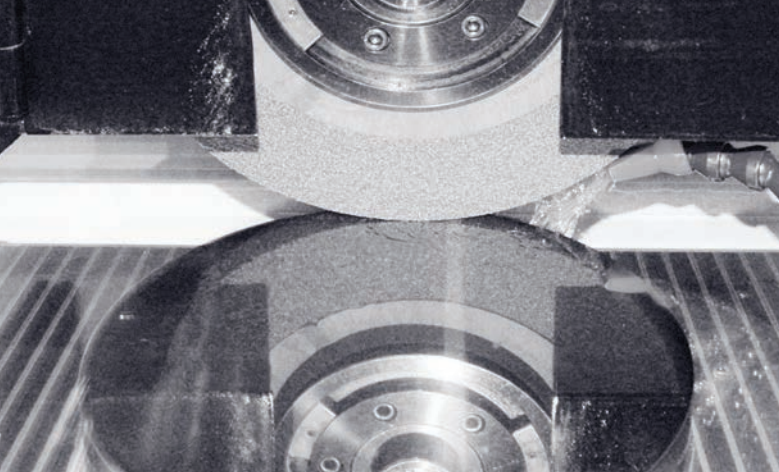


The wheel dressing mode ensures the grinding wheel remains true for consistent grinding accuracy

# Applications



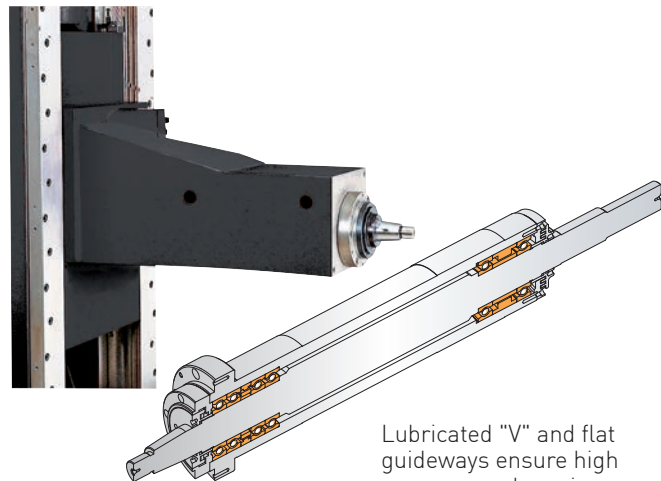
The FSG-ADIV Series has built-in long-term value in process-based applications



# Machine Construction

## Spindle design

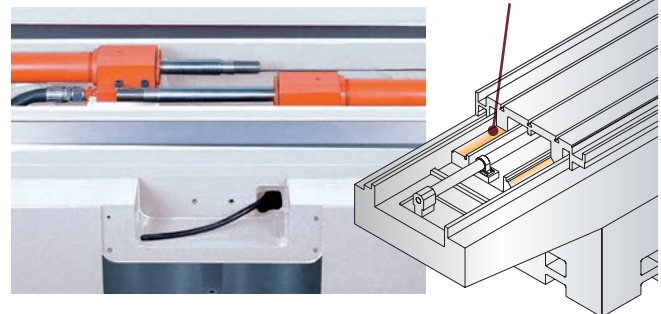
The spindle is supported by six Class 7 (P4) super-precision, angular-contact ball bearings, which have been accurately measured, selected and preloaded and assembled in a temperature controlled clean room. The spindle is permanently lubricated and requires no maintenance. The large diameter spindle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



Lubricated "V" and flat guideways ensure high accuracy and precise positioning with stick-slip free movement.

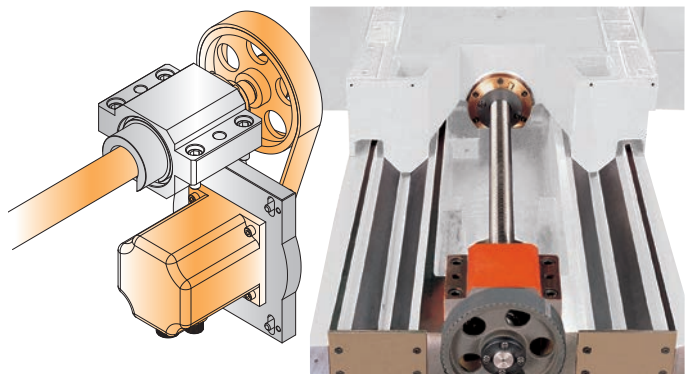
## Longitudinal slide ways

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 ensure smooth, stick-slip free movement of the table and accurate positioning for wheel dressing.



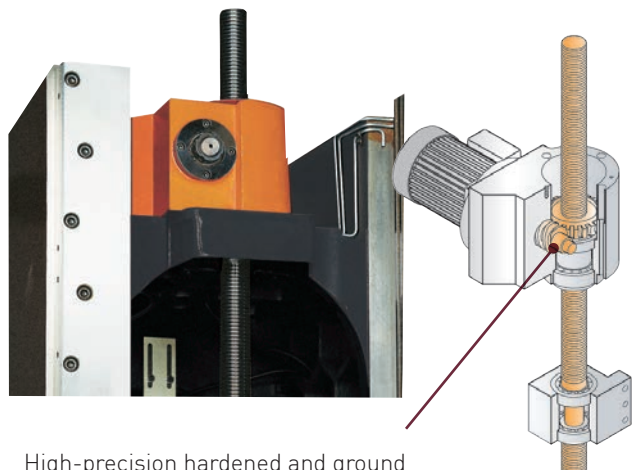
## FSG-20ADIV series offers cross-feed transmission mechanism

An enlarged precision ballscrew with backlash adjustment device is driven by an AC motor. The encoder-type stroke setting key allows cross-feed reversal points to be set from operator's control panel, which increases efficiency.



## Elevating transmission mechanism

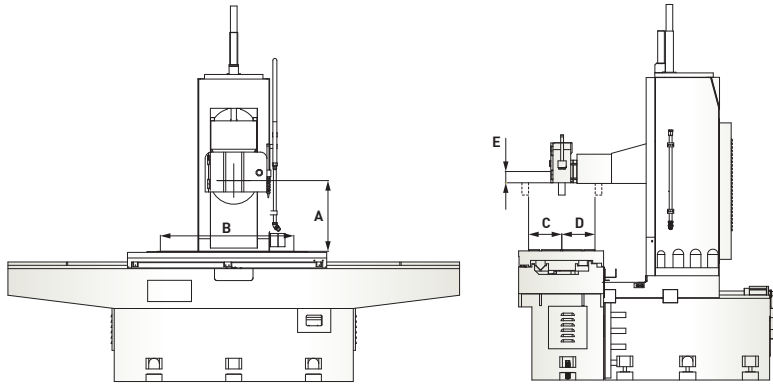
The wheelhead, travelling on a preloaded hardened and ground guideway system, is driven by a hardened and ground ballscrew and an AC servo motor, providing high torque, speed and accurate positioning with minimum increment of 0.001mm (0.00001"). A manual pulse generator (MPG) is standard for easy operation.



High-precision hardened and ground ballscrew drives the wheelhead and guideway system with positioning accuracy at a minimum increment of 0.001mm (0.00001").

## Max. Working Space

Units: mm (")

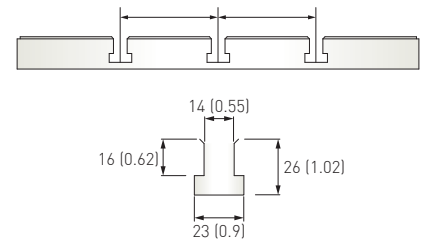


Item	A	B	C	D	E
FSG-2040ADIV	730 (28.7)	1,000 (39.4)	250 (9.8)	250 (9.8)	85 (3.3)
FSG-2060ADIV	730 (28.7)	1,500 (59.1)	250 (9.8)	250 (9.8)	85 (3.3)
FSG-2440ADIV	850 (33.5)	1,000 (39.4)	300 (11.8)	300 (11.8)	105 (4.1)
FSG-2460ADIV	850 (33.5)	1,500 (59.1)	300 (11.8)	300 (11.8)	105 (4.1)
FSG-2480ADIV	850 (33.5)	2,000 (78.7)	300 (11.8)	300 (11.8)	105 (4.1)

## Table and T-slot Dimensions

Units: mm (")

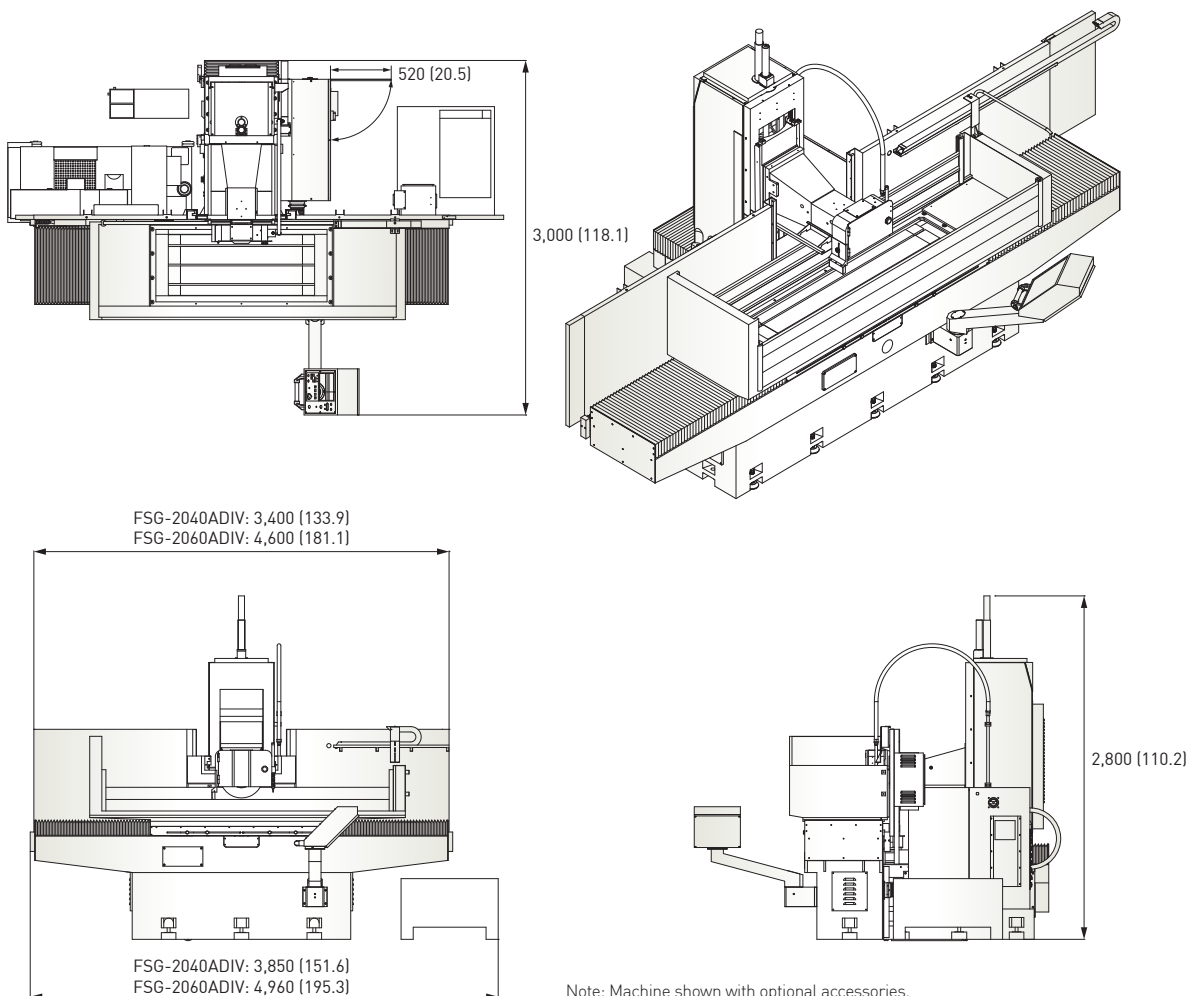
FSG-20ADIV 160 (6.3) FSG-20ADIV 160 (6.3)  
FSG-24ADIV 210 (8.3) FSG-24ADIV 210 (8.3)



FSG-20ADIV	T-slot x 3
FSG-24ADIV	T-slot x 3

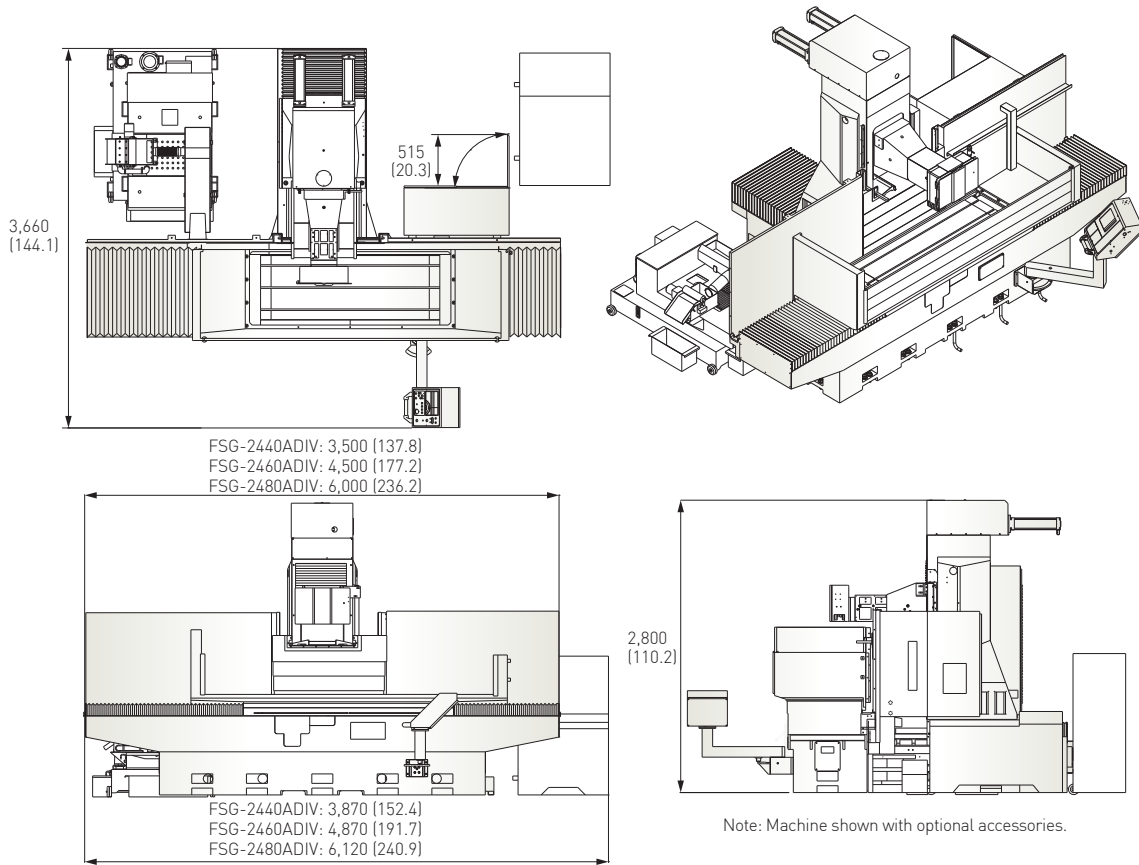
## Machine Dimensions - FSG-20ADIV Series

Units: mm (")

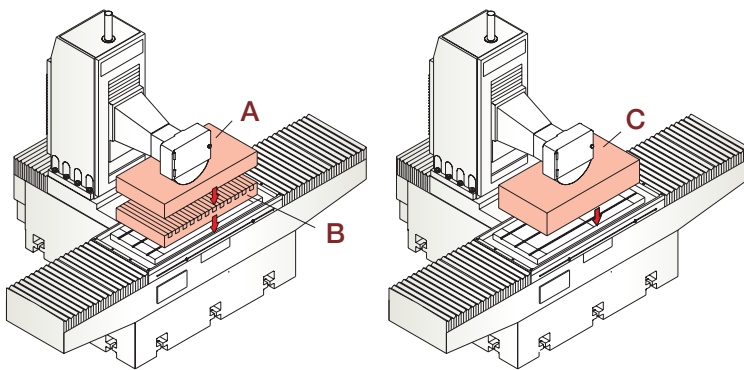


# Machine Dimensions - FSG-24ADIV Series

Units: mm (")

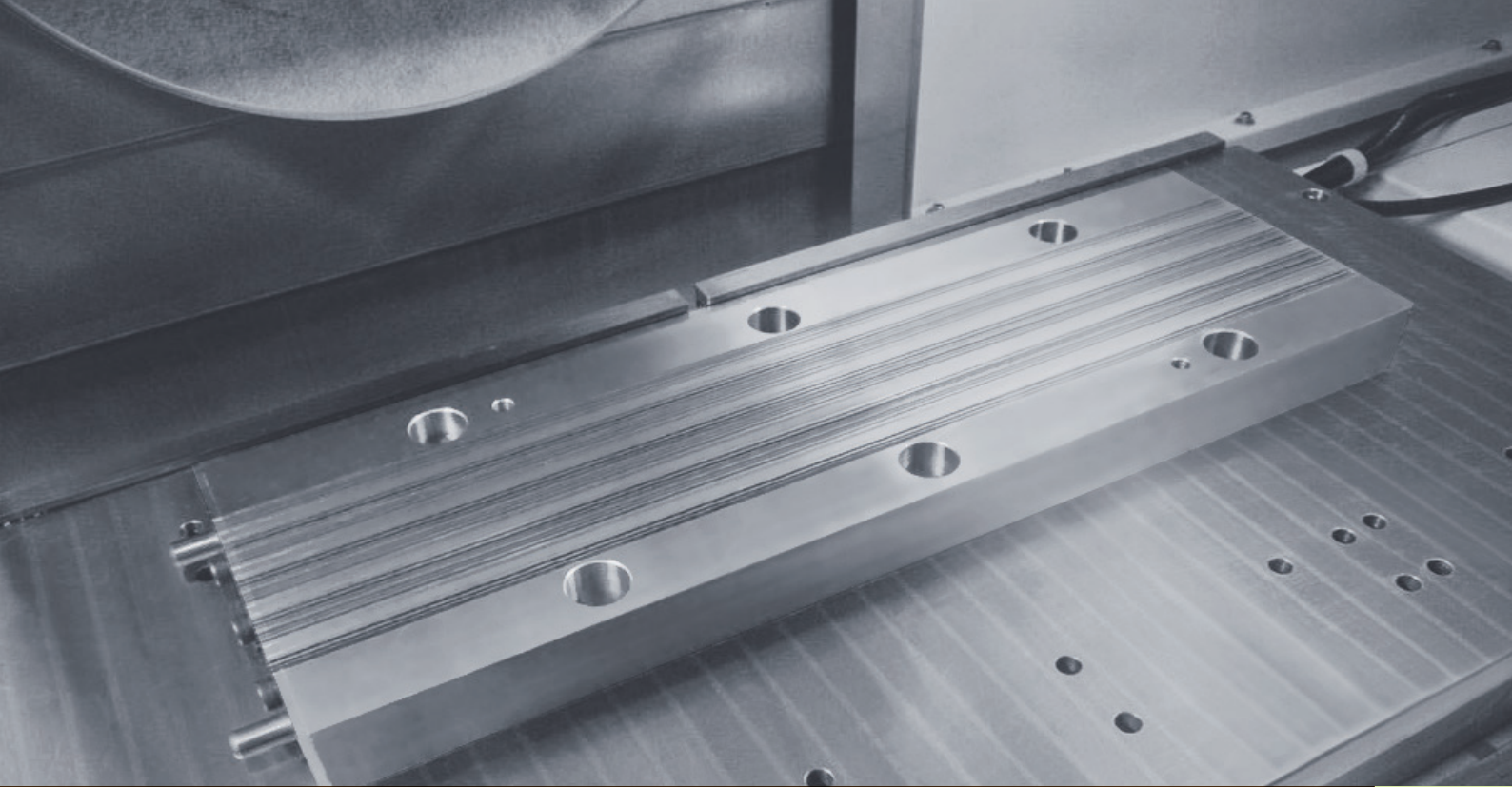


## Loading Capacity



Item	FSG-2040ADIV	FSG-2060ADIV	FSG-2440ADIV	FSG-2460ADIV	FSG-2480ADIV
A	900 kg (1,980 lbs.)	1,100 kg (2,425 lbs.)	1,120 kg (2,469 lbs.)	1,320 kg (2,910 lbs.)	1,240 kg (2,733 lbs.)
B	270 kg (594 lbs.)	440 kg (970 lbs.)	380 kg (837 lbs.)	480 kg (1,056 lbs.)	760 kg (1,650 lbs.)
C	1,170 kg (2,579 lbs.)	1,540 kg (3,395 lbs.)	1,150 kg (3,306 lbs.)	1,800 kg (3,960 lbs.)	2,000 kg (4,409 lbs.)

Suggested maximum table loads  
A = Workpiece, B = Chuck, C = A+B



A full line of standard and optional accessories adds flexibility to FSG-ADIV Series grinders

## Accessories

### Standard accessories

- Wheel flange (optional reserve wheel flanges available):  
Clamping width 22~38mm(0.9"~1.5" )(FSG-20ADIV)  
Clamping width 43~50mm(1.7"~2" )(FSG-24ADIV)
- Grinding wheel (OD x Width x Bore):  
Ø355x50xØ127mm(Ø14"x2"xØ5" )(FSG-20ADIV)  
Ø405x75xØ127mm(Ø16"x3"xØ5" )(FSG-24ADIV)
- Splash guard
- Stylus
- Double-sided water baffle (FSG-24ADIV)
- Leveling pads:  
FSG-2040/2060ADIV: 16 pieces,  
FSG-2440ADIV: 14 pieces,  
FSG-2460ADIV: 18 pieces,  
FSG-2480ADIV: 20 pieces
- Leveling screws and nuts:  
FSG-2040/2060ADIV: 16 sets,  
FSG-2440ADIV: 14 sets,  
FSG-2460ADIV: 18 sets,  
FSG-2480ADIV: 20 sets
- Toolbox (includes balancing arbor, wrench, hex head wrench)

### Optional accessories

- Chuck control
- Electromagnetic chuck
- Diamond dresser
- Balance stand roller
- 15 HP spindle motor
- Coolant system with auto paper feeding device
- Coolant system with auto paper feeding device and magnetic separator
- Hydraulic tank and oil cooler
- Y/Z axis linear scale
- Parallel dressing attachment (hydraulic type)
- Over the wheel automatic straight-line dressing and compensation device.
- Automatic table dresser with compensation (includes special hydraulic oil tank\*)
- Double-sided water baffle (FSG-20ADIV)
- Creep feed device
- Work lamp

# Specifications

Item	Description	FSG-2040ADIV	FSG-2060ADIV	FSG-2440ADIV	FSG-2460ADIV	FSG-2480ADIV
Control system		iSurface				
Capacity	Max. grinding length-longitudinal	1,000 mm (39.4")	1,500 mm (59.1")	1,000 mm (39.4")	1,500 mm (59.1")	2,000 mm (78.7")
	Max. grinding width-crosswise	500 mm (19.7")		600 mm (23.6")		
	Distance between table to spindle centerline	730 mm (28.7")		850 mm (33.5")		
	Height from the machine table to ground	990 mm (39")		880 mm (34.6")		
	Max. table load	1,170 kg (2,579 lbs.)	1,540 kg (3,395 lbs.)	1,500 kg (3,306 lbs.)	1,800 kg (3,968 lbs.)	2,000 kg (4,409 lbs.)
Table	Table size	500 x 1,000 mm (19.7" x 39.4")	500 x 1,500 mm (19.7" x 59.1")	600 x 1,000 mm (23.6" x 39.4")	600 x 1,500 mm (23.6" x 59.1")	600 x 2,000 mm (23.6" x 78.7")
	T-slots (width x pitch x no.)	14 mm x 210 mm x 3 (0.6" x 8.3" x 3)				
	Table speed (variable)	5-25 m/min (16-82 fpm)				
	Max. table travel	1,100 mm (43.3")	1,600 mm (63")	1,100 mm (43.3")	1,600 mm (63")	2,100 mm (82.7")
Transverse movement (Z)	Max. travel	560 mm (22")		675 mm (26.6")		
	Feed speed	0-2,250 mm/min (0-7.38 fpm)				
	Automatic transverse movement	0.001-32 mm (0.00001"-1.3")		0.001-32 mm (0.00001"-1.3")		
	Min. input	0.001 mm (0.00001")				
Wheelhead elevation (Y)	Max. travel	560 mm (22")		675 mm (26.6")		
	Feed speed	0-396 mm/min (0-1.3 fpm)		0-675 mm/min (0-2.2 fpm)		
	Automatic elevating movement	0.001-0.04 mm (0.00001"-0.0016")				
	Min. input	0.001 mm (0.00001")				
Spindle	Spindle speed	500-1,800 rpm				
	Spindle motor	7.5 kW (10 HP)		11 kW (15 HP)		
Motors	Axis motors (Y/Z)	Y: AC servo 2.4 kW, Z: AC servo 1.1 kW		Y: AC servo 2.4 kW, Z: AC servo 1.1 kW		
	Hydraulic motor	3 HP / 6 P	5 HP / 6 P	5 HP / 6 P (2440ADIV)   7.5 HP / 6 P (2460 / 2480ADIV)		
Wheel dimension	OD x Width x Bore	Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5")		Ø405 x 75 x Ø127 mm (Ø16" x 3" x Ø5")		
Power and air requirement	Power required	18 kVA	20 kVA	24 kVA	26 kVA	
Machine dimensions	Floor space (W x D x H)	3,850 x 3,000 x 2,800 mm (151.6" x 118.1" x 110.2")	4,960 x 3,000 x 2,800 mm (195.3" x 118.1" x 110.2")	4,870 x 3,660 x 2,800 mm (191.7" x 144.1" x 110.2")	4,950 x 3,660 x 2,800 mm (194.8" x 144.1" x 110.2")	6,000 x 3,660 x 2,800 mm (236.2" x 144.1" x 110.2")
	Net weight	6,200 kg (13,600 lbs.)	7,900 kg (17,400 lbs.)	8,400 kg (18,500 lbs.)	9,800 kg (21,600 lbs.)	10,600 kg (23,300 lbs.)
Accuracy	Accuracy standard	ISO 1986-1				

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