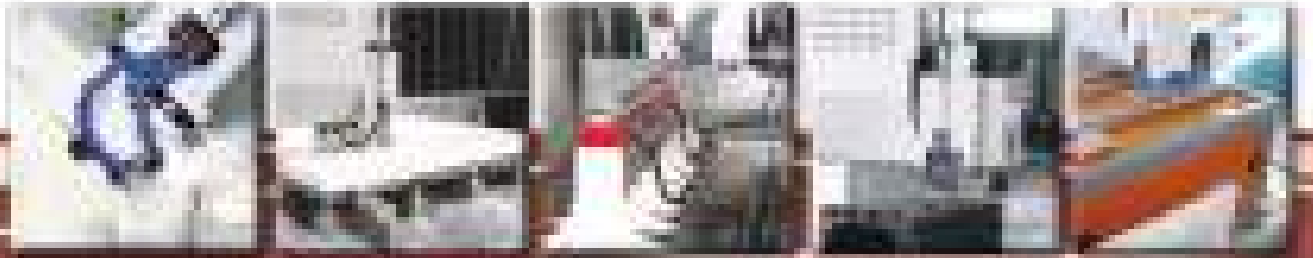


CHEVALIER®

Grinding / Turning / Milling



FSG Series

Double Column with
Fixed-Beam CNC Grinder

FSG-4060 • 4080 • 40120DC • 40160DC

FSG-5060 • 5080 • 50120DC

FSG-6060 • 6080 • 60120DC • 60160DC

FSG-40 • 50 • 60 DC Series

Double Column Fixed-Beam Grinder Features Easy Set-up, Programming and Operation.

The FSG-DC series stands out as the number one choice for double column fixed-beam grinders. The easy to use interface, full CNC user-friendly control system, total workpiece capacity and the rigidity and accuracy of the dual column design offers impressive performance.

Chevalier's patented elevation guideways and spindle structure have four heavy-duty square slideways that provide maximum rigidity and heavy-duty grinding capacity. The spindle head on the Y-axis runs on four hardened, ground and wider guides traveling on Turcite-B anti-friction material. A reducer and servo motor coupled with a high-accuracy ballscrew and a pneumatic counterweight balance system ensures smooth movement and prevents the head from crashing in case of a power failure.

A high-precision, cartridge-type spindle is equipped with four Class 7 (P4) angular contact ball bearings and a set of NN type, precision-needle roller bearings.

FSG-40 • 50 • 60 DC

- Elevation Guideway and Spindle Structure
- The Design of Wide Span for Saddle Movement
- Enlarged Double "V" Longitudinal Guideway Design
- User-Friendly Conversational Control





FSG-5080DC

Note: Machine shown with optional accessories

FSG-40 • 50 • 60 DC Series

Machine Construction

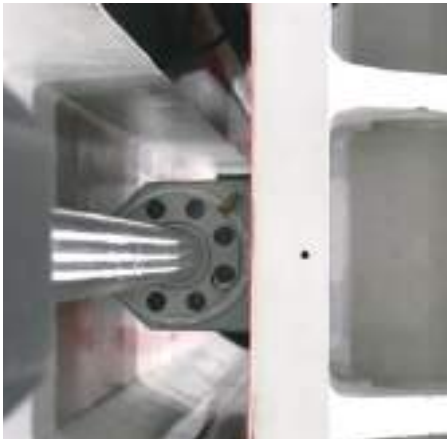
Linear Guideways and Spindle Head Structure

Adopt high precision linear guideway for transverse movement of spindle head to ensure movement accuracy in long term usage.

Elevation also adopt high precision linear guideway with gear reducer and AC servo motor. In addition it installs air counter balance to increase sensitivity in elevation to ensure no deferrance in feeding.

Saddle System Design

Saddle of spindle head consists of high accuracy ballscrew and high precision linear guideway driven directly by AC servo motor. It provides smooth movement.



Spindle Construction

The spindle in front runs with two P4 (Class 7) grade super precision contact ball bearings and NN type precision roller bearings. The spindle in rear is supported with two super precision angular contact bearings. Special grease suitable for high speed rotation is loaded and no additional lubrication is required. The cartridge outer diameter of spindle is grooved to accommodate an optional oil cooling device to minimize heat.

Horizontal Grinding Head

The horizontal wheelhead is positioned with C2 ballscrew and is counterbalanced with a pneumatic cylinder to ensure precise movement. The $\text{Ø}500 \times 100 \times \text{Ø}127 \text{ mm}$ ($\text{Ø}20'' \times 4'' \times \text{Ø}5''$) grinding wheel is driven by a 25 HP spindle motor. The spindle runs with NN type tapered roller bearings for extreme rigidity and high precision.



FSG-40 • 50 • 60 DC Series

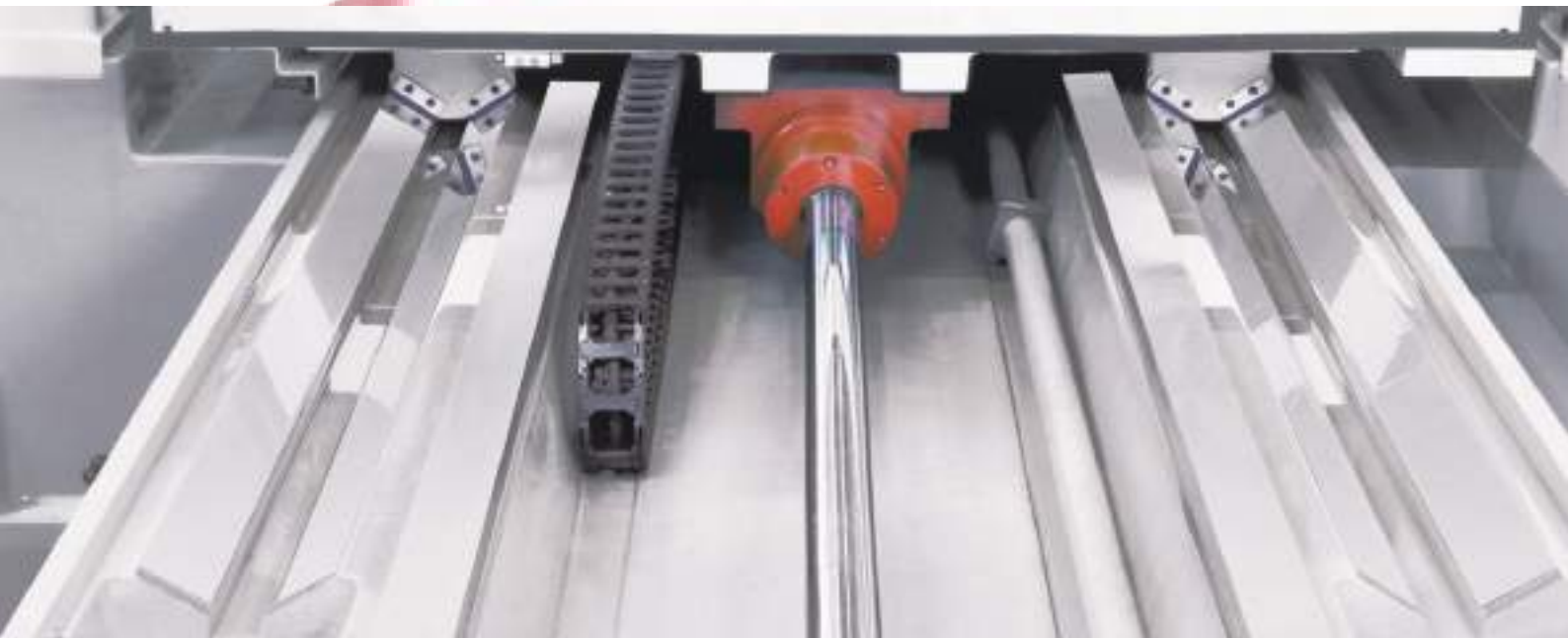
Machine Construction

Machine Base and Table Design

Base and table design is high quality cast iron. The X-axis of table is coated with Turcite-B and travels on the hardened and ground double "V" base guideway with smooth stick-slip free precision movement.

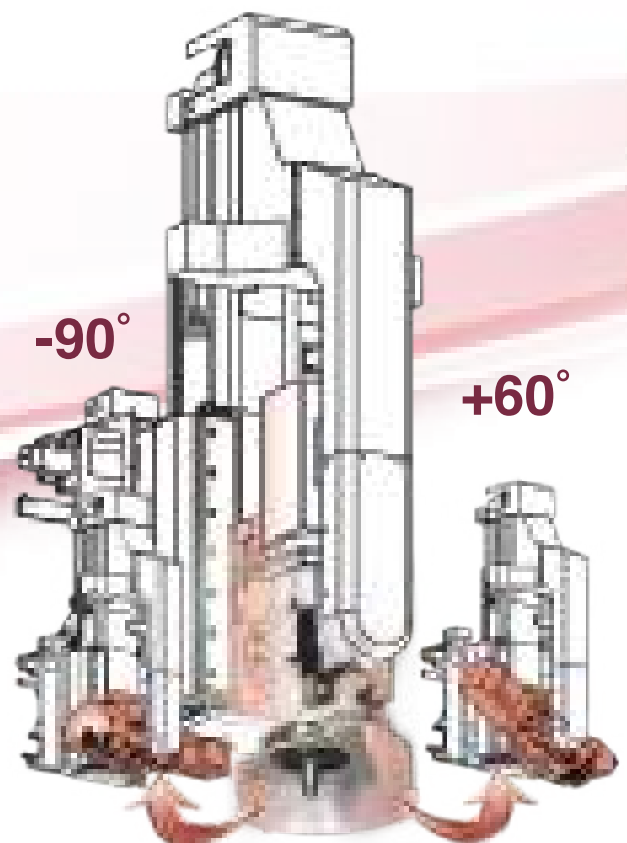
Automatic Lubrication System

The machine utilizes two kinds of lubrication systems: the first one is a centralized lubrication system with pressure release function to provide oil throughout the machine including the Y-axis wheelhead guideways, Z-axis cross slide, and ballscrews; the second one is a continuous lubrication system to provide lubrication oil for longitudinal movement.



Vertical Grinding Head (Optional)

- Equipped with pneumatic counter weight balance system and gear transmission to achieve the high positioning accuracy.
- Rotation structure is driven by speed reducer and servo motor to save time and power consumption.
- Max. rotation -90° and $+60^\circ$, flexible and easy operation.
- Hydraulic clamp/unclamp device assists to position at assigned degree regardless of automatic or manual operation.



FSG-40 • 50 • 60 DC Series

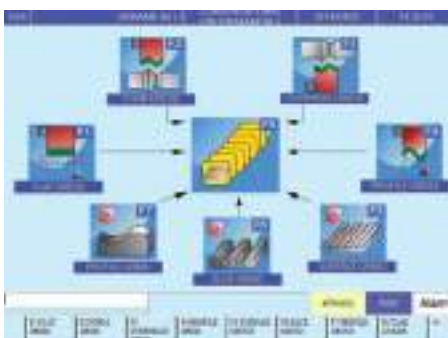
SMART CNC User-Friendly Control

Applicable for FSG-40 • 50 • 60 DC Series

- CHEVALIER SMART CNC controller (PC Based).
- 10.4" TFT color screen.
- Table stroke can be adjusted from screen (patented design).
- Internet / Intranet connectivity.
- Conversational graphics program for grinding and dressing.
- Surface / Plunge / Profile / TaskLink.
- Optional profile grinding programs.
- Integrated conversational grinding and wheel dressing with automatic compensation.
- Grinding simulation mode executable through the MPG handwheel.
- Non-equal pitch and depth grinding capability.
- Program transfers through Ethernet port.
- FANUC CNC program compatible.
- Support USB and screen can be capture and saved for record and service.



Friendly Interface Design



Grinding Menu



Machining Axis Display



Profile Grind Conversational Setting Screen

FSG-40 • 50 • 60 DC Series

Standard Accessories

- Oil cooler for hydraulic system
- Air conditioner for electric cabinet
- Grinding wheel
($\varnothing 500 \times 100 \times \varnothing 127$ mm, horizontal head x1)
- Wheel flanges (1 for horizontal spindle)
- Tool kit (one tool set and lifting fixture)
- Diamond dresser with diamond
- Leveling bolts, nuts and pads
- Balancing arbor
- Operation manual
- Paper filter type coolant system (500 L)



- Hydraulic tank and oil cooler –
The hydraulically driven table can reach speeds of up to 25 m/min. A built-in oil cooler stabilizes the hydraulic oil temperature to maintain a constant viscosity.



- The control pendant has its own hydraulic counter balance system for fast and precise positioning. (Only applicable on vertical head mechanism)



Optional Accessories

- Electromagnetic chuck (with chuck control)
- Table mounted grinding wheel dresser (without diamond disc)
- Y, Z, V, W, axis linear encoder
- Wheel balancing stand
- Extra wheel flange
- Wheel head type dresser for over-head dresser for horizontal spindle
- Automatic paper filter type coolant system with magnetic separator and chiller (with temperature control system 700 L)



- Dynamic wheel balancing system (SCHMITT Industries, Inc.)



- Automatic paper filter type coolant system with magnetic separator and chiller – (with temperature control system is optional)
 - > Coolant chiller
 - > Drum type filtration system
 - > Capacity: 2000 L



FSG-40 • 50 • 60 DC Series

Dimensional Drawings

Unit: mm (")

Model	FSG-4060DC	FSG-4080DC	FSG-40120DC	FSG-40160DC	FSG-5060DC	FSG-5080DC	FSG-50120DC
A	6,030 (237.4)	7,030 (276.8)	9,030 (355.5)	11,030 (434.3)	6,030 (237.4)	7,030 (276.8)	9,030 (355.5)
B	4,160 (163.7)	5,160 (203.1)	7,160 (281.8)	9,160 (360.6)	4,160 (163.7)	5,160 (203.1)	7,160 (281.8)
C	3,850 (151.6)				3,850 (151.6)		
D	1,050 (41.3)				1,300 (51)		
E	900 (35.4)				900 (35.4)		
F	1,400 (55)				1,650 (64.9)		

40 Series: 3,300 mm (129.9")
50 Series: 3,850 mm (151.6") 470 mm (18.5")

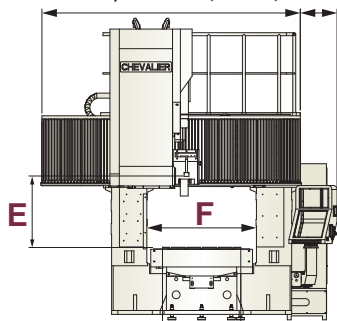
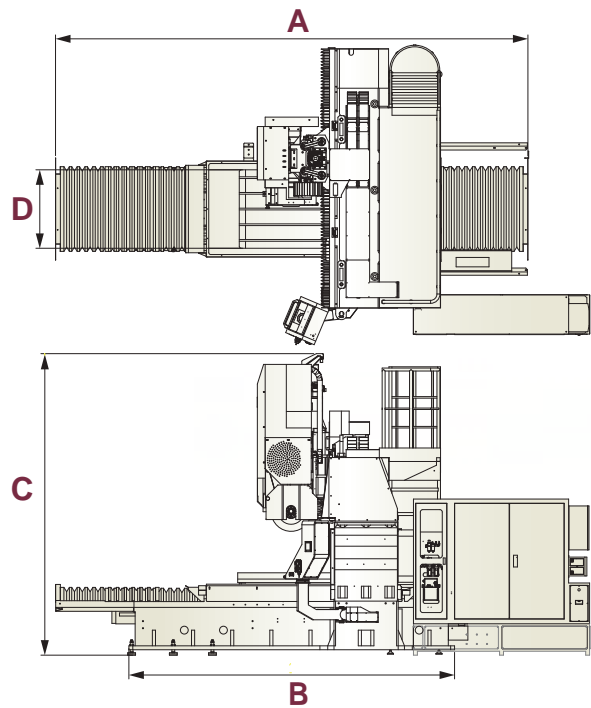
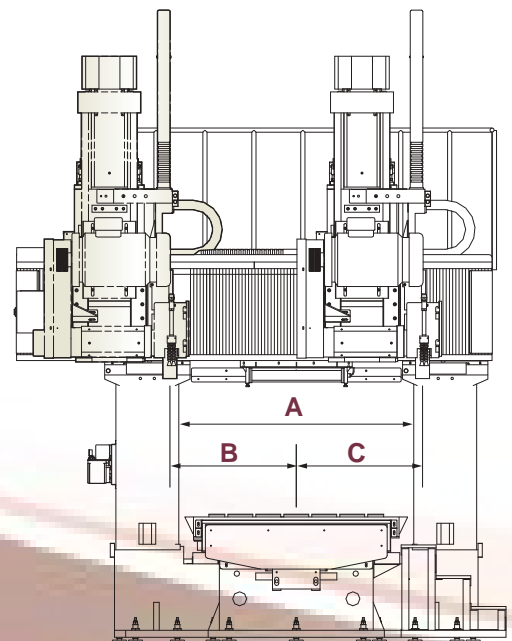
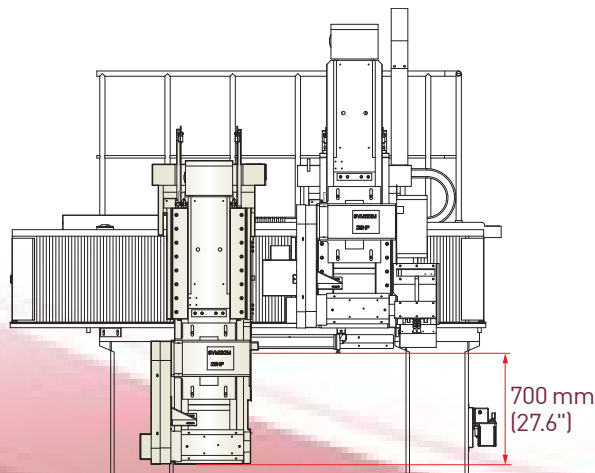


Table Size

40 Series: 1,000 mm (39.3")
50 Series: 1,250 mm (49")



Horizontal Grinding Head Travel



Model	FSG-40	FSG-50	FSG-60
A	1,315 (51.8)	1,575 (62)	2,056 (80.9)
B	685 (27)	825 (32.5)	1,028 (40.5)
C	630 (24.8)	750 (29.5)	1,028 (40.5)

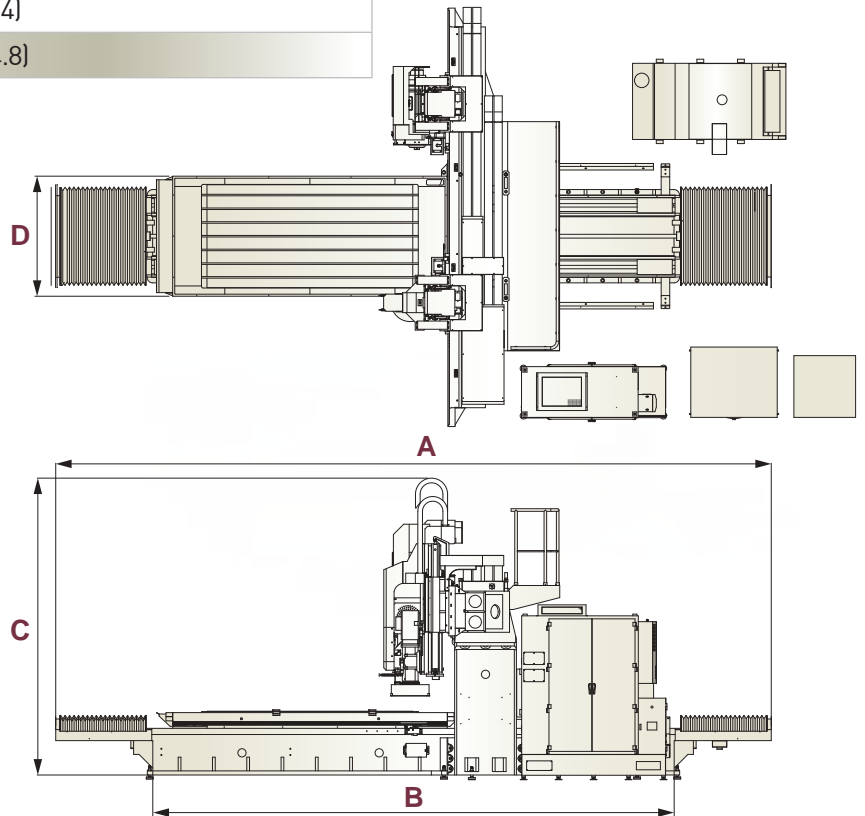
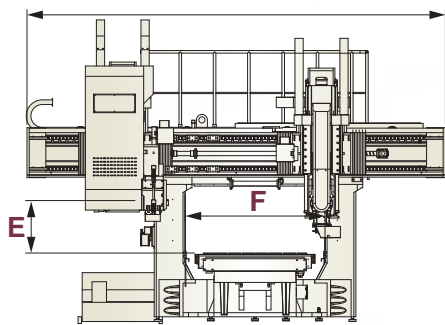
FSG-40 • 50 • 60 DC Series

Dimensional Drawings

Unit: mm (")

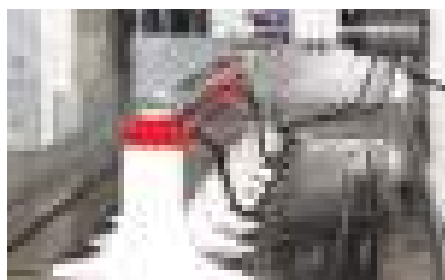
Model	FSG-6060DC	FSG-6080DC	FSG-60120DC	FSG-60160DC
A	6,430 (235.1)	8,430 (331.8)	10,430 (410.6)	12,430 (489.4)
B	4,760 (187.4)	5,760 (226.8)	7,760 (305.5)	9,760 (384.3)
C	3,960 (155.9)			
D	1,550 (61)			
E	900 (35.4)			
F	1,900 (74.8)			

Horizontal Head: 4,175 mm (164.4")
Horizontal and Vertical Head: 6,175 mm (243")



Applications

Applicable in vehicle industry, aerospace industry, machinery and metal industry, pneumatic and hydraulic parts industry, electronics industry, textile industry, automation industry and others.



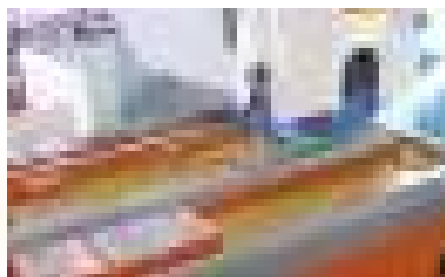
Automation Industry
(Linear Guideway)



Machinery and Metal Industry
(Casting)



Electronics Industry (LCD TV)



Machinery and Metal Industry
(Casting)



Building Industry (Tile Molds)

FSG-40 • 50 • 60 DC Series

Specifications

Item		FSG-4060DC	FSG-4080DC	FSG-40120DC	FSG-40160DC
Capacity	Max. Grinding Length-Longitudinal	1,500 mm (59")	2,000 mm (79")	3,000 mm (118")	4,000 mm (157")
	Max. Grinding Width-Crosswise	1,000 mm (39.3")			
	Distance from Table to Spindle Centerline (Vertical Head is Optional Accessory)	Horizontal Head 900 mm (35.4"), Optional 1,150 mm (45.3") Vertical Head 500 mm (19.7") / 800 mm (31.5") ★			
	Max. Workpiece Weight	3,500 kg	4,500 kg	5,500 kg	6,500 kg
Table	Table Working Size	1,000 x 1,500 mm (39.3" x 59")	1,000 x 2,000 mm (39.3" x 79")	1,000 x 3,000 mm (39.3" x 118")	1,000 x 4,000 mm (39.3" x 157")
	T-Slots (W x Dist. x No.)	22 mm x 200 mm x 5 (0.9" x 7.9" x 5)			
	Distance Between Column (Door Width)	1,400 mm (55")			
	Table Speed	5~25 m/min (16~82 fpm)			
	Max. Table Stroke	1,700 mm (67")	2,200 mm (86.6")	3,200 mm (126")	4,200 mm (165")
Transverse Movement (Z/W-axis)	Max. Stroke	1,250 mm (49")			
	Feed Speed	0~5 m/min (0~16.4 fpm)			
	Min. Input Value	0.001 mm (0.0001")			
Elevating Movement	Horizontal Head	Max. Stroke	700 mm (27.6")		
		Feed Speed	0~1 m/min (0~3.2 fpm)		
		Min. Input Value	0.001 mm (0.0001")		
	Vertical Head (Optional)	Vertical Balancing Device	Pneumatic Counter Weight		
		Max. Feed Stroke	700 mm (27.6")		
		Feed Speed	0~1 m/min (0~3.2 fpm)		
		Min. Input Value	0.001 mm (0.0001")		
		Vertical Balancing Device	Pneumatic Counter Weight		
Spindle Speed and Grinding Wheel	Spindle Speed	Horizontal Head	500~2,000 rpm		
		Vertical Head (Optional)	500~2,000 rpm ★		
	Wheel Size (OD x W x Bore)	Horizontal Head	Ø500 x 100 x Ø127 mm (Ø20" x 4" x Ø5")		
		Vertical Head (Optional)	Ø400 x 50 x Ø127 mm (Ø16" x 4" x Ø5") ★		
Control System		CHEVALIER SMART CNC Control			
Motors	Horizontal Head Spindle Motor	18.75 kW (25 HP)			
	Vertical Head Spindle Motor (Optional)	15 kW (20 HP)			
	Hydraulic Tank Motor	12.5 kW (17 HP)		15 kW (20 HP)	
Power Requirement	Power Required	70 Kva		73 Kva	
	Pressure	6 kg/cm ²			
Tank Capacities	Hydraulic Tank Volume	550 L		650 L	
	Lubricant Tank Volume	180 L			
	Coolant Tank Volume	500 L			
Machine Dimensions	Machine Height	3,850 mm (151.6"), Optional 4,100 mm (161.4")			
	Machine Weight	17,800 kg (39,160 lb)	20,600 kg (45,320 lb)	23,800 kg (52,360 lb)	28,500 kg (62,700 lb)
Accuracy	Positioning Accuracy	0.015 mm			
	Repeatability Accuracy	0.008 mm			
	Accuracy Standard	ISO 4703			

★ For FSG-40 • 50 DC Series, only one Grinding Head can be installed on the machine, either Horizontal Head or Vertical Head.

FSG-5060DC	FSG-5080DC	FSG-50120DC	FSG-6060DC	FSG-6080DC	FSG-60120DC	FSG-60160DC
1,500 mm (59")	2,000 mm (79")	3,000 mm (118")	1,500 mm (59")	2,000 mm (79")	3,000 mm (118")	4,000 mm (157")
1,250 mm (49")			1,500 mm (59")			
Horizontal Head 900 mm (35.4"), Optional 1,150 mm (45.3") Vertical Head 500 mm (19.7") / 800 mm (31.5") ★						
4,000 kg	5,000 kg	6,000 kg	6,000 kg	7,000 kg	8,000 kg	9,000 kg
1,250 x 1,500 mm (49" x 59")	1,250 x 2,000 mm (49" x 79")	1,250 x 3,000 mm (49" x 118")	1,500 x 1,500 mm (59" x 59")	1,500 x 2,000 mm (59" x 79")	1,500 x 3,000 mm (59" x 118")	1,500 x 4,000 mm (59" x 159")
22 mm x 200 mm x 6 (0.9" x 7.9" x 6)			22 mm x 200 mm x 7 (0.9" x 7.9" x 7)			
1,650 mm (65")			1,900 mm (75")			
5~25 m/min (16~82 fpm)						
1,700 mm (67")	2,200 mm (86.6")	3,200 mm (126")	1,700 mm (67")	2,200 mm (86.6")	3,200 mm (126")	4,200 mm (165")
1,500 mm (59")			1,700 mm (67")			
0~5 m/min (0~16.4 fpm)						
0.001 mm (0.0001")						
700 mm (27.6")						
0~1 m/min (0~3.2 fpm)						
0.001 mm (0.0001")						
Pneumatic Counter Weight						
700 mm (27.6")						
0~1 m/min (0~3.2 fpm)						
0.001 mm (0.0001")						
Pneumatic Counter Weight						
500~2,000 rpm						
500~2,000 rpm ★			500~2,000 rpm			
Ø500 x 100 x Ø127 mm (Ø20" x 4" x Ø5")						
Ø400 x 50 x Ø127 mm (Ø16" x 4" x Ø5") ★			Ø400 x 50 x Ø127 mm (Ø16" x 4" x Ø5")			
CHEVALIER SMART CNC Control						
18.75 kW (25 HP)						
15 kW (20 HP)						
12.5 kW (17 HP)		15 kW (20 HP)		15 kW (20 HP)		18.75 kW (25 HP)
70 Kva	73 Kva	90 Kva	65 Kva	73 Kva	90 Kva	
6 kg/cm ²			6 kg/cm ²			
550 L		650 L		650 L		950 L
180 L						
500 L						
3,960 mm (155.9"), Optional 4,210 mm (166")						
20,000 kg (44,000 lb)	23,000 kg (50,600 lb)	26,500 kg (58,300 lb)	26,500 kg (58,300 lb)	30,000 kg (66,000 lb)	34,800 kg (76,560 lb)	395,000 kg (86,900 lb)
0.015 mm						
0.008 mm						
ISO 4703						

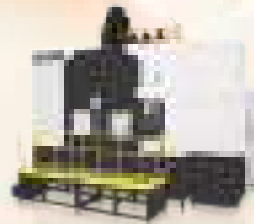
*All content is for reference only and may be subject to change without notice or obligation.



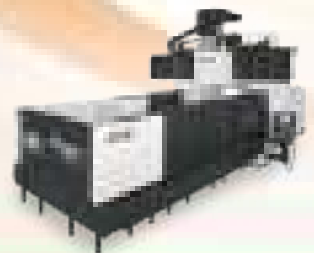
Grinding Machines



Grinding Machines



Turning Machines



Milling Machines

Headquarters

FALCON MACHINE TOOLS CO., LTD.

No. 34, Hsing Kong Road, Shang Kang, Chang Hua
TAIWAN 50971

Tel: +886 4 799 1126 Fax: +886 4 798 0011

www.chevalier.com.tw

overseas@chevalier.com.tw

U.S.A. Headquarters

CHEVALIER MACHINERY INC.

9925 Tabor Place, Santa Fe Springs, CA 90670 U.S.A.

Tel: (562) 903 1929 Fax: (562) 903 3959

www.chevalierusa.com

info@chevalierusa.com