

FSG-12/16 ADIV Series

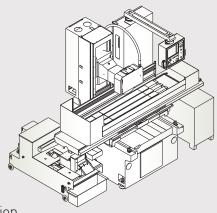
Fully Automatic Precision Surface Grinder

In-machine dynamic balancing





Fully Automatic Precision Surface Grinders



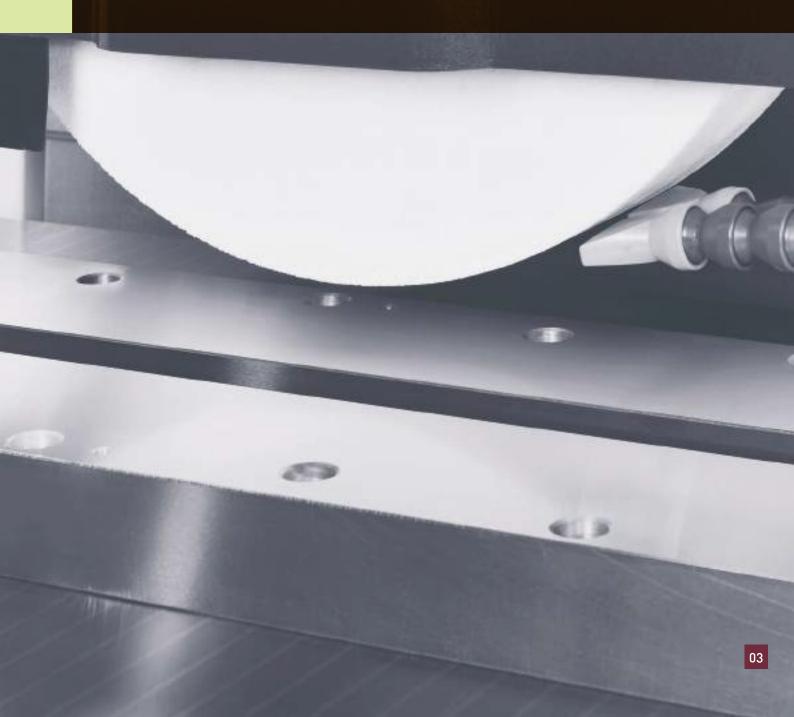
Chevalier's FSG-ADIV Series of surface grinders have several design features to shorten your processing and non-processing preparation while delivering high-precision workpieces year after year—functions you might not expect on such affordable machines: iSurface control, variable speed spindle, constant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

FSG-ADIV Series grinders also feature 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-1224ADIV is shown with optional accessories.

Constant surface speed adjusts as the grinding wheel's diameter changes for increased accuracy



iMachine Communications System™ (iMCS)

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iMCS is a comprehensive remote monitoring software that integrates with IoT functions on Chevalier's CNC machines to perform 24/7 data collection, utilization monitoring, data analysis, alarm history, maintenance and overall equipment effectiveness (OEE), all which help to avoid downtime and increases productivity. Additional PC and software are required.

Key Features and Benefits

In-machine dynamic balancing

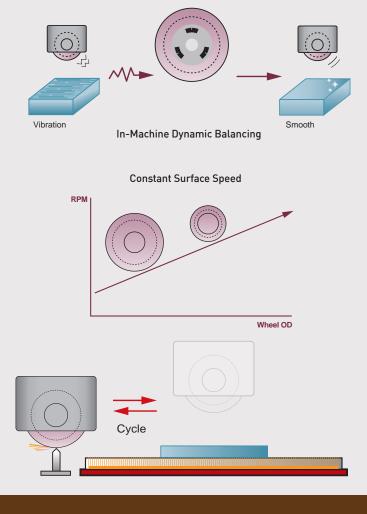
By manually adjusting the in-machine dynamic balancing function, operators can reduce grinding wheel vibration and eliminate the surface workpiece ripple to improve grinding quality.

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.

Automatic dressing on table (optional)*

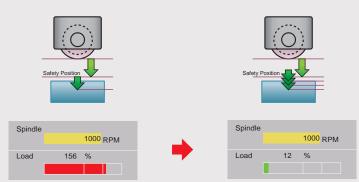
When the grinder enters an automatic dress cycle, the table automatically positions itself where the diamond is set to dress and compensate according to operator settings.



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

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

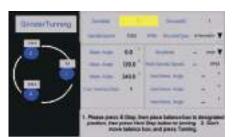
Unlike PLC control boards, the PC-based control's powerful computing power enhances the HMI for more precise control. Combined with data analysis from network connectivity, it permits managers to improve production presses for higher output.

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Perfect HMI control

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

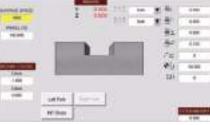


In-Machine Dynamic Balancing



Automatic Dressing on Table (optional)*





Plunge Grinding Mode



Surface Grinding Mode



Crisscross Grinding Mode

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.

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 functionality.



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

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.: standard

The FSG-1632ADIV is shown with optional accessories.



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

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Applications

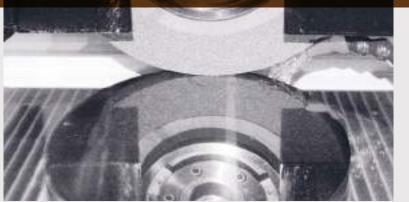








The FSG-ADIV Series has built-in long-term value in process-based applications

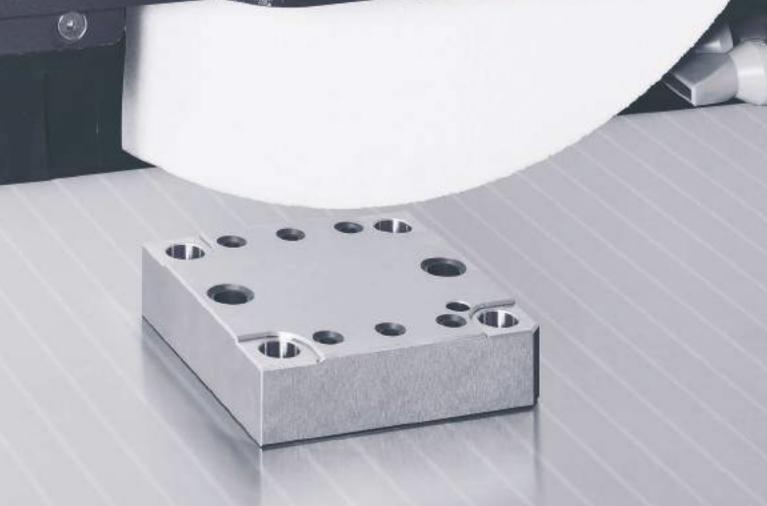








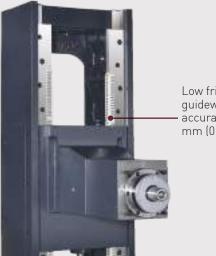
FSG-ADIV Series is ideal for job shops, as well as the aerospace and construction industries



Machine Construction

Wheelhead and column system

FSG-ADIV Series wheelhead and column system is composed of hardened and ground steel guideways with inserted roller bearings. This system is preloaded which imparts zero clearance for precise straight movement, accurate feeds and precise linear movement without deviation, even during rapid traverse movement.



Low friction wheelhead guideway system enables accurate feeds even at 0.001 mm (0.00001") increments.

Completely supported guideways

The series includes extended base guideways for crossfeed and longitudinal travel to enhance rigidity and stability, upgrade accuracy and longevity and eliminate table overhang to completely support permissible loads.

The guideway rails are composed of (S55C) steel, normalized and hardened by high frequency induction. The heat treated roller bearings are preloaded between the linear guideways, ensuring accurate positioning, free of stick-sip movement.

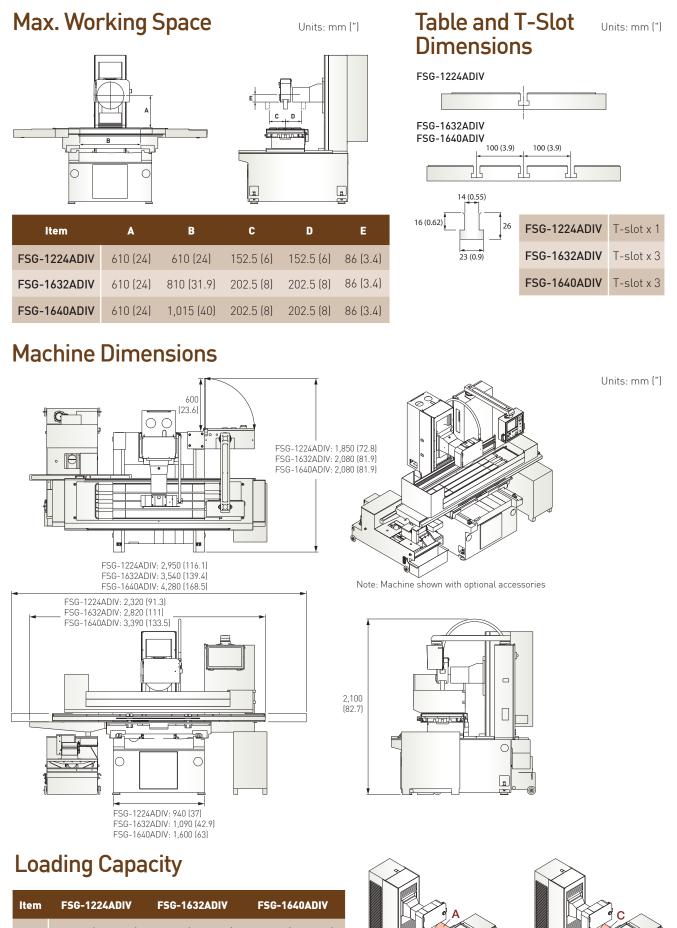
AC servo motor

The AC motor provides high torque, speed and accurate positioning with minimum increments of 0.001 mm (0.00001"). A manual pulse generator (MPG) is included for ease of operation.

The cross-feed speed is controlled by the AC servo motor for better surface finish, precise movement and wheel dressing from the table.

3-axis linear roller guideways enhance rigidity and stability for cross-feed and longitudinal travel

Precision roller bearings run through a matching sleeve, which is preloaded between the linear guideways to ensure accurate and precise positioning with stick-slip free movement.



Α	145 kg (319 lbs.)	175 kg (385 lbs.)	220 kg (484 lbs.)
В	85 kg (187 lbs.)	175 kg (385 lbs.)	220 kg (484 lbs.)
С	230 kg (506 lbs.)	350 kg (770 lbs.)	440 kg (968 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 19~38 mm (0.7" ~ 1.5") • Grinding wheel (OD x Width x Bore):
- Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5")
- Splash guard
- Stylus
- Leveling pads: FSG-1224/1632ADIV: 4 pieces FSG-1640ADIV: 6 pieces
- Leveling screw and nuts: FSG-1224/1632ADIV: 4 sets FSG-1640ADIV: 6 sets
- Toolbox (includes balancing arbor, wrench, hex head wrench, diamond dresser with diamond)

Optional accessories

- Chuck control
- Electromagnetic chuck
- Diamond dresser
- Coolant system with auto paper feeding device
- Coolant system with auto paper feeding device and magnetic separator
- Hydraulic oil tank chiller
- Over-the-wheel automatic straight-line dressing and compensation device
- Y/Z axis linear scale
- Parallel dressing attachment (hydraulic type)
- Automatic table dresser with compensation (includes special hydraulic oil tank*)
- Double-sided water baffle
- Guideway-type balancing stand
- Heat exchanger for electric cabinet
- Work lamp

Specifications

Max. grinding length- long: using length- long: using length- icrasswise. 610 mm (24'] 810 mm (31.9') 1,015 mm (40') Max. sprinding width- crasswise. 305 mm (12') 405 mm (15.9') Max. sprinding width- crasswise. 610 mm (24') 610 mm (24') Height from table to ground 970 mm (38.2') 980 mm (38.6') Max. table load 230 kg (506 lbs.) 350 kg (770 lbs.) 440 kg (968 lbs.) Table size 300 x 600 mm (11.8' x 23.6') 400 x 800 mm (15.7' x 31.5') 400 x 1.000 mm (15.7' x 39.4') Table size 14 mm x 100 mm x 1 (0.6' x 5.9' x 1) 14 mm x 100 mm x 3 (0.6' x 3.9' x 3) 400 x 1.000 mm (15.7' x 31.5') Table speed (variable) 5-25 m/min (16-82 fpm) 400 x 1.000 mm (17.7') Max. travel 350 mm (13.8') Hydraulic 450 mm (17.7') Max. travel 350 mm (13.8') 450 mm (17.7') Max. travel 350 mm (13.8') 450 mm (10.0001'-1.3') Max. travel 300 mm (18.9') 450 mm (17.7') Max. travel 400 mm (10.0001'-0.0016') 450 mm (17.7') Max. travel 300 mm (13.8') 450 mm (10.0001'-0.0016') Max. travel 0.0	Item	Description	FSG-1224ADIV	FSG-1632ADIV	FSG-1640ADIV
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Wheelhead movement [Y]Feed speed $0-675 \text{ mm/min } [0-2.2 \text{ fpm}]$ Automatic elevating movement [step] $0.001-0.04 \text{ mm } [0.00001"-0.0016"]$ Min. input $0.001-0.04 \text{ mm } [0.00001"-0.0016"]$ Min. input $0.001 \text{ mm } [0.00001"]$ Spindle motor $500-1,800 \text{ rpm}$ Spindle motor $3.75 \text{ kW } (5 \text{ HP}) \text{ Opt. } 5.5 \text{ kW } (7.5 \text{ HP})$ MotorsAxis motors (Y/Z)Mydraulic motor $0.74 \text{ kW } (1 \text{ HP}) / 6P$ Meel timension $0D \times \text{Width } x \text{ Bore}$ Power required requirement $9 \text{ kVA } (11.5 \text{ kVA optional})$ Power required requirement $9 \text{ kVA } (11.5 \text{ kVA optional})$ Machine two power and air requirement $Pressure$ Flow $6 \text{ kg/cm}^2 (86 \text{ psi})$ Consumption (W x D x H) $2,950 \times 1,850 \times 2,100 \text{ mm}$ $(116" x 72.8" x 82.7")$ $3,540 \times 2,080 \times 2,100 \text{ mm}$ $(168.5" \times 81.9" \times 82.7")$		Min. input	0.001 mm (0.00001")		
Wheelhead novement (Y) Automatic elevating movement (step) 0.001-0.04 mm (0.00001"-0.0016") Min. input 0.001 mm (0.00001") Min. input 0.001 mm (0.00001") Spindle speed 500-1,800 rpm Spindle motor 3.75 kW (5 HP) Opt. 5.5 kW (7.5 HP) Motors Mxis motors (Y/Z) Hydraulic motor 0.74 kW (1 HP) / 6P Y/Z: AC servo 1.1 kW Hydraulic motor 0.74 kW (1 HP) / 6P Yower and air requirement Power required Power required 9 kVA (11.5 kVA optional) Yesure 6 kg/cm² (86 psi) Total air consumption Pressure Flow Kachine (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7")	Wheelhead movement (Y)	Max. travel	480 mm (18.9")		
novement [Y] Automatic elevating movement [step] $0.001-0.04 \text{ mm} [0.00001"-0.0016"]$ Min. input $0.001 \text{ mm} [0.00001"]$ Spindle speed $500-1,800 \text{ rpm}$ Spindle motor $3.75 \text{ kW} (5 \text{ HP}) \text{ Opt. 5.5 kW} (7.5 \text{ HP})$ Motors $Axis motors (Y/Z)$ $Y/Z: AC \text{ servo } 1.1 \text{ kW}$ Motors $0.01 \times Widh x \text{ bords}$ $0.74 \text{ kW} (1 \text{ HP}) / 6P$ $1.5 \text{ kW} (2 \text{ HP}) / 6P$ Need timension $0.0 x \text{ Widh } x \text{ Bords}$ $0.50 \times 0.127 \text{ rm} (0.14" x 2" x 05")$ $0.0 \text{ kW} (11.5 \text{ kVA optional})$ $10 \text{ kVA} (12.5 \text{ kVA optional})$ Power required requirement $P \text{ kVA} (11.5 \text{ kVA optional})$ $10 \text{ kVA} (12.5 \text{ kVA optional})$ $0.0 \text{ kVA} (12.5 \text{ kVA} optional)$ $0.0 \text{ kVA} (12.5 \text{ kVA} optiona)$		Feed speed	0~675 mm/min (0~2.2 fpm)		
SpindleSpindle speed500-1,800 rpmSpindle motor $3.75 \text{ kW} (5 \text{ HP}) \text{ Opt. } 5.5 \text{ kW} (7.5 \text{ HP})$ MotorsAxis motors (Y/Z)Y/Z: AC servo 1.1 kWHydraulic motor $0.74 \text{ kW} (1 \text{ HP}) / 6P$ $1.5 \text{ kW} (2 \text{ HP}) / 6P$ Wheel timensionOD x Width x Bore $0.355 \times 50 \times 0.127 \text{ mm} (0.14^{\circ \times 2^{\circ \times 0.57}})$ Power and air requirementPressure total air consumption $9 \text{ kVA} (11.5 \text{ kVA optional})$ $10 \text{ kVA} (12.5 \text{ kVA optional})$ Machine timensionsPressure (N x D x H) $6 \text{ kg/cm}^2 (86 \text{ psi})$ total $2.00 \text{ NL/min (7 cfm)}$			0.001~0.04 mm (0.00001"~0.0016")		
Spindle Spindle motor 3.75 kW (5 HP) Opt. 5.5 kW (7.5 HP) Motors Axis motors (Y/Z) Y/Z: AC servo 1.1 kW Hydraulic motor 0.74 kW (1 HP) / 6P 1.5 kW (2 HP) / 6P Wheel timension OD x Width x Bor Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5") Power and air requirement Power required 9 kVA (11.5 kVA optional) 10 kVA (12.5 kVA optional) Power and air requirement Pressure tonsumption 6 kg/cm ² [86 psi] Flow 200 NL/min (7 cfm) Machine timensions Floor space (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7") 4,280 x 2,080 x 2,100 mm		Min. input	0.001 mm (0.00001")		
Spindle motor 3.75 kW (5 HP) Opt. 5.5 kW (7.5 HP) Axis motors (Y/Z) Y/Z: AC servo 1.1 kW Hydraulic motor 0.74 kW (1 HP) / 6P 1.5 kW (2 HP) / 6P Vheel dimension OD x Width x Bore Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5") Power and air requirement Power required 9 kVA (11.5 kVA optional) 10 kVA (12.5 kVA optional) Power in dimension Pressure 6 kg/cm² (86 psi) 200 NL/min (7 cfm) 200 NL/min (7 cfm) Machine dimensions Floor space (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7") 4,280 x 2,080 x 2,100 mm (168.5" x 81.9" x 82.7")	Chindle	Spindle speed	500~1,800 rpm		
Motors $0.74 \text{kW} (1 \text{HP}) / 6P$ $1.5 \text{kW} (2 \text{HP}) / 6P$ Wheel timension $0 \text{D} \text{w}$ with $ \text{x} B \text{D} \text{w}$ $0.74 \text{kW} (1 \text{HP}) / 6P$ $1.5 \text{kW} (2 \text{HP}) / 6P$ Wheel timension $0 \text{D} \text{w}$ with $ \text{x} B \text{D} \text{w}$ $0.74 \text{kW} (1 \text{HP}) / 6P$ $0.54 \text{kW} (2 \text{HP}) / 6P$ Power $0 \text{D} \text{w}$ with $ \text{x} B \text{D} \text{w}$ $0.54 \text{w} B \text{L}^2 \text{w}$ $0.54 \text{kW} (2 \text{HP}) / 6P$ $0.54 \text{kW} (2 \text{HP}) / 6P$ Power required Power required $9 \text{kVA} (11.5 \text{kVA optional})$ $10 \text{kVA} (12.5 \text{kVA optional})$ $0.6 \text{kg/cm}^2 (86 \text{psi})$ $0.0 \text{kg/cm}^2 (86 \text{psi})^2 (168 \text{sg/cm}^2 \text{kg/cm}^2 \text$	Spinute	Spindle motor	3.75 kW (5 HP) Opt. 5.5 kW (7.5 HP)		
Hydraulic motor 0.74 kW (1 HP) / 6P 1.5 kW (2 HP) / 6P Wheel timension OD x Width x Bor Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5") Power and air equirement Power required 9 kVA (11.5 kVA optional) 10 kVA (12.5 kVA optional) Power and air equirement Pressure 6 kg/cm ² (86 psi) Total air consumption Pressure Flow 200 NL/min (7 cfm) Machine timensions Floor space (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7")	Matana	Axis motors (Y/Z)	Y/Z: AC servo 1.1 kW		
Immension OD x Width x Bore Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5") Power and air requirement Power required 9 kVA (11.5 kVA optional) 10 kVA (12.5 kVA optional) Power and air requirement Pressure 6 kg/cm² (86 psi) Somumption Pressure 200 NL/min (7 cfm) Machine timensions Floor space (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7")	MOLOIS	Hydraulic motor	0.74 kW (1 HP) / 6P 1.5 kW (2 HP) / 6P		
Power and air requirement Total air consumption Pressure Flow 6 kg/cm ² (86 psi) Aachine dimensions Floor space (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7") 4,280 x 2,080 x 2,100 mm (168.5" x 81.9" x 82.7")	Wheel dimension	OD x Width x Bore	Ø355 x 50 x Ø127 mm (Ø14" x 2" x Ø5")		
Total air consumption Pressure 6 kg/cm² (86 psi) Aachine dimensions Floor space (W x D x H) 2,950 x 1,850 x 2,100 mm (116" x 72.8" x 82.7") 3,540 x 2,080 x 2,100 mm (139.4" x 81.9" x 82.7") 4,280 x 2,080 x 2,100 mm (168.5" x 81.9" x 82.7")	Power and air requirement	Power required	9 kVA (11.5 kVA optional) 10 kVA (12.5 kVA optional)		
consumption Flow 200 NL/min (7 cfm) Machine Floor space 2,950 x 1,850 x 2,100 mm 3,540 x 2,080 x 2,100 mm 4,280 x 2,080 x 2,100 mm Machine (W x D x H) (116" x 72.8" x 82.7") (139.4" x 81.9" x 82.7") (168.5" x 81.9" x 82.7")		Total air Pressure			
Machine (W x D x H) (116" x 72.8" x 82.7") (139.4" x 81.9" x 82.7") (168.5" x 81.9" x 82.7")		concumption			
	Machine dimensions				4,280 x 2,080 x 2,100 mm (168.5" x 81.9" x 82.7")
		Net weight	2,200 kg (4,850 lbs.)	2,900 kg (6,390 lbs.)	3,500 kg (7,710 lbs.)
Accuracy Accuracy standard ISO 1986-1	Accuracy	Accuracy standard		ISO 1986-1	

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